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**Université de Montréal**

**Health promotion program implementation, a socio-technical networking process:  
A case study of a school-based nutrition intervention**

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A case study of a school-based nutrition intervention**

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## RÉSUMÉ

Les programmes de promotion en santé sont définis en fonction de la participation des parties intéressées à la planification et l'implantation. Dans l'implantation des programmes, on tient compte de la diversité des styles, des expériences et des intérêts de ces dernières, mais on n'examine pas comment ces différences convergent dans l'action programmée. Pour les cadres d'implantation, où le but est souvent régi par des normes, on reconnaît la diversité afin de rapprocher les différents points de vue ou d'établir un contrôle des facteurs modifiants. Il existe actuellement un besoin pour un cadre théorique différent qui rende compte de la participation des parties intéressées et des adaptations consécutives du programme.

Cette étude vise à appliquer un cadre conceptuel pour l'implantation d'un programme considéré comme processus de réseautage sociotechnique. Nous conceptualisons le programme comme étant une innovation en santé publique, et ce faisant, nous empruntons un outil conceptuel à la sociologie de la technologie qui étudie l'interdépendance dynamique entre le social (c.-à-d. l'humain) et les entités techniques (c.-à-d. le non-humain) liée aux processus technologiques ou innovateurs.

Il s'agit de l'étude de cas d'une intervention en nutrition menée par six nutritionnistes communautaires auprès d'enfants d'écoles primaires provenant de quelques-uns des quartiers les plus défavorisés de Montréal. Pour la cueillette de données et l'analyse, nous nous sommes inspirées de la théorie de la traduction et de son approche méthodologique consistant à « suivre l'acteur ». Nous avons recueilli des données rétrospectives (entrevues d'informatrices-clés et documents historiques) et transversales (entrevues semi-structurées avec des nutritionnistes communautaires et observations des activités du programme). Pour l'analyse de données, nous nous sommes basées sur les moments de traduction de Callon, élément de la théorie de la traduction élaborée par Bruno Latour et Michel Callon.

Nous avons constaté que l'implantation d'un programme contribue à l'élargissement et la consolidation du réseau sociotechnique. Le programme d'éducation en nutrition s'est développé grâce à la participation d'un groupe d'acteurs dont les aptitudes particulières et les préférences ont défini les liens qui ont façonné le réseau. En tant que groupe d'acteurs responsable de l'implantation du programme dans les écoles, les nutritionnistes ont décrit leur rôle de façon à rendre le programme intéressant pour les acteurs du milieu scolaire. Les stratégies utilisées par les nutritionnistes pour bâtir des liens dépendaient donc des identités des acteurs scolaires. Lorsqu'un acteur social ou technique découvrait la limite du réseau à répondre à un problème spécifique, de nouveaux acteurs se montraient intéressés ou l'on répondait en traduisant les acteurs déjà impliqués. Les identités des acteurs sociaux ou techniques devenaient alors, jusqu'à un certain point, négociables, ce qui permettait, à cet égard, l'adaptation et l'implantation du programme dans les écoles.

Contrairement aux conceptualisations sur l'implantation de programmes comme processus instrumental correspondant plus ou moins « automatiquement » à la théorie des programmes, nos conclusions indiquent qu'elle constitue un processus social essentiel grâce auquel les intervenants traduisent les activités du programme comme étant des moyens de négocier avec les parties intéressées par le programme et, par conséquent, alimentent la théorie des programmes par leur pratique. Vus sous cet angle, les programmes sont itérativement soumis à la pratique et à la théorie avec l'intégration de nouveaux acteurs dans le réseau.

Mots-clés : implantation de programme, promotion de la santé, théorie de l'acteur-réseau, sociologie de la traduction

## SUMMARY

Health promotion programs are described in terms of stakeholder involvement in planning and implementation. Program implementation theory recognizes program actors as having a variety of styles, experiences and interests however does not address how these differences converge during programmed action. Implementation frameworks identify diversity for the purpose of reconciling various viewpoints or controlling for effect modifications, where the aim is often fixated upon the application of normative standards for program implementation. There is presently a need for an alternative theoretical framework which accounts for stakeholder involvement and the ensuing program adaptations.

This study aimed to apply a conceptual framework through which program implementation can be conceptualised as a socio-technical networking process. We conceptualise the program as a public health innovation, and in so doing, call upon a conceptual apparatus from the social studies of technology which studies the dynamic inter-relationships between social (i.e. human) and technical entities (i.e. non-human) in relation to technological or innovative processes.

This is a case study of a nutrition intervention delivered by six community nutritionists to elementary school children living in some of Montreal's most disadvantaged neighbourhoods. Data collection and analysis were guided by the theory of translation, and its methodological approach to 'follow the actor'. Retrospective (key informant interviews and historical documents) and cross-sectional (semi-structured interviews with community nutritionists and program activity observations) data were collected. Data analysis took conceptual guidance from the Callon's moments of translation as part of the theory of translation advanced by Bruno Latour and Michel Callon.

Implementing a program was found to be a process of expanding and stabilizing a socio-technical network. The nutrition education program developed over time

through the involvement of a group of actors whose unique abilities and interests defined the connections which gave the network its form. As the focal actor group responsible for implementing the program into the school, nutritionists described their role in relation to the connections they aimed to establish to render the program interesting to the school actors. The strategies by which nutritionists built connections were thus inter-dependant with the identities of the school actors. As a social or technical actor revealed a limitation of the network to respond to a particular problem, new actors became interested or involved actors were translated, in response. The identities of social or technical actors was then something that could be negotiated, to a certain extent, and in this respect, permitted the program to adapt and become implemented in schools.

In contrast with conceptualisations of program implementation as an instrumental process which conforms more or less ‘automatically’ to program theory, findings reveal program implementation as essentially a social process whereby interventionists translate program operations as a means of negotiating with program stakeholders and thus inform the program theory through their practices. In this light, programs are being practiced and theorized iteratively as new actors are becoming integrated into the program’s network.

Key words: program implementation, health promotion, actor network theory, sociology of translation

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## INTRODUCTION

A program is public health's *modus operandi* and evaluation plays an indispensable role in the legitimization of these 'programmed actions' (Dab, 2005). More specifically, programs are identified as instrumental devices composed of resources which become mobilized to create activities and services in a particular context with the aim of improving the health of a targeted population over a set timeframe (Pineault & Daveluy, 1986). In health promotion programming and evaluation, the program tends to be represented as a diagnosis of a public health problem, a state-of-the-art 'treatment' and an assessment to determine the effectiveness of the treatment (Green & Kreuter, 1991).

Embracing the participatory and emancipation values espoused by the Ottawa Charter (WHO, 1986), health promotion offers an approach which is distinctive to that typified by disease prevention (Rootman, Goodstadt, Potvin, & Springett, 2001). Following from the Ottawa Charter, health promotion programs aim to engage groups to participate in processes of change and development at the individual, organizational and policy levels (Kickbusch, 1994). Rather than being static and pre-defined, health promotion programs are in a "dialectical relationship" (Potvin, Haddad, & Frohlich, 2001, p. 47) with the setting within which they aim to impart change. Health promotion programs are thus not invariably prescribed treatments to health problems and are not always dominated by professional expertise or knowledge. Rather, in many cases, they develop from a plurality of knowledge and approaches to address an issue in a collaborative process (Dab, 2005). In this light, health promotion programs are programmed social actions in which people create new meanings associated with health and negotiate their role in relation to the program's objectives. The general objective of this thesis is to examine the social processes inherent to health promotion program implementation.

#### The dialectical relationship between program in theory versus program in practice

Program implementation places the 'essential' parameters of the program into action. While what is essential is based upon a subjective perception, the literature on health promotion program identifies the essential parameters of the program as the recognizable program actions including activities, services and resources (Potvin

et al., 2001). Implicit in its reference to activities, services and resources, program implementation implies that the actors who are delivering a program as well as those who are supporting or receiving it, will take on new roles and establish new relationships with both new or familiar actors. Implementation of a program further implies the occurrence of change to people's interactions not only with other individuals but also with tangible (e.g., material, schedule) or intangible (e.g., knowledge, abilities) things or entities. For example, the implementation of a school based nutrition program implies that school actors are willing to participate in various forms of change. In addition to the explicit objectives related to students and families (e.g., eating more fruits and vegetables, fewer snack foods), a nutrition program imposes change among school personnel with respect to their regular activities and school routines. For example, the implementation of a nutrition program may require teachers to adjust a curriculum or timetable, or to undergo training, acquire new knowledge and teach new material (Johnson et al., 2003; Stevens et al., 2003). Nutrition programs may also change or introduce new relationships within the school, by bringing in new people (e.g., parents, community members, health professionals) or by introducing new forms of interactions (and tensions) among students (e.g., peer leadership), teachers (e.g., role modeling) and between students and teachers (e.g., enforcing nutrition policy rules) (Anderson et al., 1998; Baranowski et al., 2000; Reynolds et al., 2000). These actions and interactions arguably give form to the program and as a result, the evaluation might capture the processes whereby groups and individuals collectively and individually make decisions regarding the extent they are ready or willing to participate or contribute to this new program of action.

Although the contextualized nature of health promotion planning and evaluation is acknowledged (Green & Kreuter, 1999) and the rhetoric of implementation implies that the program-in-action is dynamic and contingent upon the particularities of the setting (Love, 2004; Weiss, 1998), there is little empirical evidence to demonstrate program action in this light. Instead, implementation is overwhelmingly situated within a normative framework where the program-in-practice is expected to conform to the program-in-theory. That is, as a quintessential set of predetermined and limited 'essential' program operations which have been identified *a priori* as preconditions to specific set of outcomes. In this light,

implementation evaluation reveals the program-in-practice in order to determine the degree to which the program-in-theory is operating, thus allowing the occurrence of program outcomes to be fairly judged. Thus program-in-practice either does or does not reflect the program-in-theory. In this sense, program implementation is a *means* to an *end*. The dialectic of *means* and *end* is referred to as teleology (i.e. purposive development) among philosophers such as Hegel. Here, the *means* is the activity in which a subject engages with the intention of bringing about a certain *end*. However, the adequate *means* becomes itself an *end*, the discovery of which entails certain *means*. Still, an adequate conception of the *end* is a powerful *means* in its own right. In this respect, program-in-theory can be understood as having an ideal existence, which provides an essential conception of the *end*, but the actual outcome of the adopted *means* (i.e. program-in-practice) can be expected to be quite different from the abstract *end* for which the *means* are to be adopted in the first place.

Analogous to the means and ends dichotomy, a problematic practice of approaching process and outcome as two mutually exclusive concepts has similarly been challenged in health promotion evaluation (Rootman et al., 2001). Namely, in accordance with the definition proposed by the WHO Regional Office for Europe (Anonymous, 1984), and endorsed by subsequent events and publications (WHO, 1986), health promotion is “the process of enabling people to increase control over, and to improve, their health”. Accordingly, the value of a health promotion program lies in its capacity to involve individuals, organizations or communities to participate in this process of change. Thus, it can be argued that while it is important to know the frequency and duration of an activity or how many people presented themselves at an event, evaluating the implementation of health promoting principles requires gathering information on the programmed actions or processes which place an activity into operation, such as, how the activity was planned and implemented and why people made decisions to participate (or not).

The need to understand the program through the relationships which develop between the context and the program has been longstanding (Weiss, 1972). Program implementation is the embodiment of this relationship. Implementation evaluation has predominantly been used for outcome evaluation by addressing the shortcomings of “black-box” evaluation by uncovering the otherwise hidden processes that cause a

set of program effects to occur (Love, 2004; Steckler & Linnan, 2002). In this respect, implementation evaluation is described as contributing to generalizable knowledge about how social programs work and the conditions and factors that enable or obstruct their success. This approach generally accompanies a research design which holds the program operations constant within a controlled setting. In so doing, it arguably places some limits on what can be learnt from the relationships which develop between the context and the program and may be at odds with the now decades-old calls for a “contextually realistic” theory of evaluation (Cronback, 1980; Weiss, 1972), as quoted in (Rootman et al., 2001, p. 18). Instead of being held as an unattainable ideal, the program theory might become more ‘realistic’ if it is understood to be in a dynamic relationship with the practices as they unfold in context. We may learn from the quotation that there is “nothing as practical as a good theory” (Lewin, 1951; Weiss, 1995) for its suggestion that theory is indeed practical *and* thus practiced, where practice can contribute to a theory building process. This argument parallels recent calls for more practiced based evidence to build evidenced based practice (Green, 2006).

More comprehensively, implementation evaluation has three foci: 1) to provide a surveillance of the program in order to compare the planned characteristics against those delivered and explain gaps between the two; 2) to evaluate the components which relate to the observed effects in order to identify the critical elements of the program; and 3) to evaluate the specifics of the treatment in order to understand how the variations in the program’s development influence the observed results (Fleury & Denis, 2000). Implementation can thus be described as tracing the prescribed program operations to ensure that they are operating as intended, and documents ‘drift’ from the prescribed plan. Program drift is generally understood to be undesirable, having the potential to lead to Type III errors, whereby the lack of program effects is falsely attributed to an ineffective program (Basch, 1985). Program drift however can also be highly desirable leading to both individual and organizational advantages relative to programs that are highly controlled and characterized by a strict resemblance to their logical technocratic process (Fleury & Denis, 2000). Lacking, however, is a role implementation evaluation can play to address the underlying mechanisms of a program to explain these variations in a manner which is not restricted to a set of pre-determined propositions.



One barrier which prevents implementation evaluation to go beyond its rhetoric and produce generalizable knowledge about the processes which describe how programs work, lies in the nature of the theoretical frameworks which have guided implementation inquiry to date. The most pervasive frameworks used to direct implementation evaluation are the diffusion of innovation model (Rogers, 2002) and the ecological framework (Hawe & Riley, 2005; Richard et al., 2004; Scheirer, 1981, 1987). The definition of diffusion “is a special type of communication concerned with the spread of messages that are perceived as dealing with new ideas, and necessarily represent a certain degree of uncertainty to an individual or organization” (Rogers, 2002, p. 990). A health promotion program can be understood as a ‘new idea’ and the diffusion model proposes a set of factors which influence the rate at which the ‘idea’ is taken up by a set of program adopters (i.e. the user system). The focus of this model is on the adopter’s perception of the program with respect to a set of factors, including, its relative advantage, trialability, observability, complexity and compatibility (Rogers, 2002). The diffusion model has also been described as akin to a trajectory image of movement based upon inertia, whereby an innovation is inappropriately conceived as moving through time and space through a self-generated force (Latour, 1987). The ecological framework emerged out of a recognized limitation of the diffusion model and shifts attention from the individual adopters to the system in which a program may become integrated (Scheirer, 1987). The ecological model considers how the implementation of a program maintains or disrupts the adopting system’s core functioning and proposes that the implementation of a new program consider how the system will adapt to maintain its organizational structures and institutional standards with the introduction of new operations (Hawe & Riley, 2005; Pluye, Potvin, & Denis, 2004).

These frameworks guide data collection, first, to the appropriate use of the program, and second to the contextual factors enabling or obstructing the successful implantation of a given set of program operations. Missing however is consideration for the interplay between the components of the program and the adopting system. Acknowledging interplay between the program and adopting systems implies that a transformation in one system occurs in response to the other. Beyond disturbing the

equilibrium of an adopting system, as shown in the ecological framework, program implementation arguably disturbs the equilibrium of the program. In this respect, by participating in the programmed action which defines a public health program (Dab, 2005), individuals and collectives invest their material resources (e.g. personnel, workspace, money) or nonmaterial resources (e.g. time, energy, knowledge) and in so doing, may require the program to adjust. In fact, it is through these investments that innovations are understood to become relevant and thus take on meaning within an adopting system (Latour, 1987).

### Limits of current conceptions of program implementation

Concern with the capacity of current frameworks to account for what actually occurs during program operation and thus fairly judge the effectiveness of the program to bring about change is building within the evaluation literature in general (Friedman, 2001; Morell, 2005) and the public health literature in particular (Glasgow et al., 2006; Hawe & Riley, 2005). An incompatibility between diffusion type models and observations of programs in operation has been acknowledged. As opposed to being pre-defined and static, program theory is described as emerging from the dynamic contexts where programs “interpret, translate, subvert, or deploy” (Hawe, Shiell, Riley, & Gold, 2004, p. 790) the official program rhetoric with the socio-environmental contexts of their practices (Hawe & Riley, 2005). Despite this recognition of an “inherent interactivity” (Glasgow, Lichtenstein, & Marcus, 2003, p. 1263) among a diversity of actors with a range of interests, expectations and values, implementation research still tends to trace the idealized efficacy-to-effectiveness diffusion model whereby the movement of a new idea’s trajectory is either facilitated or impeded by a set of socio-demographic or experiential characteristics of the user system (Glasgow et al., 2003).

The limitations of diffusion and ecological implementation frameworks to capture the effectiveness of programs aiming to build healthy settings and engage local action is becoming increasingly apparent within a growing body of research on health promoting schools (Dooris, 2005; Inchley, Muldoon, & Currie, 2006; Rowling & Jeffreys, 2006; St Leger & Nutbeam, 2000). Despite recognition of the inability of traditional fidelity criteria to capture the presence of health promoting

principles in the school (i.e. suitable indicators of effectiveness), without an alternative, researchers continue to call upon the very methods that have been identified as less suited to the objectives of health promoting school initiatives (Inchley et al., 2006; Mukoma & Flisher, 2004; St Leger & Nutbeam, 2000). Namely, one of the key features which captures the health promoting schools rhetoric resides in the school's engagement to devise strategies to promote health in a way which responds to local need and capacity. The processes by which schools engage a diversity of actors both internal and external to the school to define a program and devise strategies are however seldom documented. Instead, environmental changes such as the appearance of a new service or policy, or individual change lifestyle indicators remain the valued program outcomes (Mukoma & Flisher, 2004; St Leger, 1999), thus overlooking the social and structural change process which may or may not have permitted such change to occur.

Along similar lines, the limitations of current implementation frameworks documenting program operations uniquely through a lens of fidelity or integrity are beginning to appear within the broader health promotion program effectiveness literature as well. While black-box evaluations which neglect the implementation process altogether are still posing challenges to the identification of effective mechanisms (Contento, Randell, & Basch, 2002), systematic reviews of programs which provide implementation measures are revealing some unexpected associations between program fidelity and effectiveness (Doak, Visscher, Renders, & Seidell, 2006; Sharma, 2006). Namely, one review found no association between the intensity of the program and outcomes (Sharma, 2006), and another found that effective programs actually had lower fidelity to essential criteria than ineffective programs (Doak et al., 2006). Recommendations from these and other school-based health promotion program reviews (Summerbell et al., 2007) identify a need to shift attention away from the program mechanisms which uniquely represent a view of program-in-theory towards the 'why and how' a diversity of actors come together to address a particular issue. That is, there is an identified need to explain why and how various program actors' own needs and values inevitably become part of the program-in-practice. A methodological framework which responds uniquely to internal monitoring (i.e. events and objectives found within the logic model), can actually be counter-productive by blocking and obscuring an opportunity to identify

and measure unplanned program accomplishments, which may in fact be of higher value to the actors involved in the program (Birkeland, Murphy-Graham, & Weiss, 2005).

#### Developing a novel program implementation conceptualization

This thesis responds to a need for an alternative framework through which the social processes that describe program implementation may be identified. That is, an alternative to that which holds a program as a fixed entity in anticipation that program operations will represent the plans and outcomes of a restricted number of 'interested' actors. The framework proposed by this thesis draws upon a sociology of action where actions are understood to arise out of the intrinsic qualities and values of a group of actors and their ability to negotiate with one another in association with their goals and interests. Program implementation is thus proposed as a set of strategies by which a focal actor group builds connections between human (e.g. students, teachers) and non-human actors (e.g. curricular program, timetable) in ways which respond to their goals and interests. Namely the actions of interventionists implementing a school-based nutrition program are understood in terms of their potential to connect objectives associated with the program to the objectives of school actors.

This study applies the sociology of translation or Actor-Network Theory (ANT) conceptual framework to the case of a nutrition program within the elementary school setting. More specifically, it suggests that implementing a program is a process of expanding and stabilizing a socio-technical network. By building a socio-technical network, human actors are building new connections between other human (social) and non-human (technical) entities (or actors) in order to advance and strengthen a collective which supports the program goals. These connections are created through the establishment of aligned interests, where technical entities are used as strategic devices to stabilize these connections.

From this theory, three propositions are applied to this study of program implementation. The first of three theoretical propositions posits that the program can be characterized as an emerging socio-technical network where its successive

translations reveal the movement in the program due to the inter-dependence of the human and non-human entities (i.e. socio-gram and techno-gram) (paper number one in the results section). The second theoretical proposition posits that even as the socio-technical network becomes more consolidated, the focal actor group remains actively involved in building new connections and stabilizing existing ones by making compromises and negotiating the use and utility of non-human actors. Finally, the third theoretical proposition posits that the work of building connections is a continuous negotiation and re-assessment of entities whose behavior as mediators or intermediaries is often uncertain.

The program, *Petits cuistots - parents en réseaux* (translated as *Little Cooks – Parental Networks*) is planned and implemented by a non-profit community organization, *Les ateliers cinq épices*. *Petits cuistots - parents en réseaux* (hereafter referred to as PC-PR) is targeted at elementary school children and their families living in disadvantaged Montreal neighborhoods and was implemented in a total of eight schools in kindergarten through grade five classes during the 2004/05 academic year. The program aims at the development of nutritional knowledge and culinary abilities of elementary schools children to favor their health and development. Also through the PC-PR pilot project, the community organization also opens to school children's parents for the development of social support networks through the bias of food and culinary art in order to favor their economic and parental responsibilities through a social integration. The *Little Cooks* component includes eight annual teacher and parent assisted monthly nutrition workshops, created and animated by community nutritionists (i.e. registered dietitians) offering concrete experiences with food, through food preparation and tasting activities. Each workshop includes: 1) didactic knowledge transmission on topics such as food transformation, food types, nutrition and health; 2) hands-on recipe completion using a cooperative learning approach; and 3) tasting of the finished recipe with samples to be taken home. The second component (*Parental Networks*) is organized by community development workers and aims to support the development of mutual support networks through parents' active involvement in the school. Parents are invited to participate with their child during the nutrition workshops and as well to attend collective dinners and family outings.

This thesis centers upon the nutrition workshop activity and the nutritionists who plan and implement this activity. This thesis does not treat the implementation of the parental component of the program (i.e. *Parental Networks*). This component of the program is planned and implemented by community development interventionists. Still however, the nutrition workshop activity can be described as a juncture point between these two components as it is during this activity where parents first participate with the program. Hence, this thesis centers upon the work of the nutrition interventionists. In as much as that work might be to connect parents to the school, it touches upon the parental component of the program.

The over-riding research question asks how PC-PR transformed over time and between settings, and why such transformations occurred. Based upon this question and guided by the ANT theoretical framework, this study will address three empirical propositions. The first posits that the emergence of the nutrition intervention will be characterized by many transformations in the over-riding goals of the program (as well as among the people and things associated with it), reflecting the need to become a recognized solution to a community/school problem. The second and third propositions suggest that as program goals become less dispersed and more focused, program transformations are still occurring in terms of how the program becomes represented and operated in relation to the conditions across the various schools. More specifically, according to the second empirical proposition, program practitioners will represent the program activities as being an indispensable response to the needs identified by them within a particular school. Finally, the third empirical proposition posits that nutritionists will differentially represent school contexts and that the operation of program activities will occur in relation to this representation. Thus, as the represented needs differ between schools, so too will the nutritionists representations and operation of program activities.

The first of three articles proposed for this thesis follows the program from its roots in 1989 through several successive iterations to arrive at its present form in the early 2000's. By following the program's movement with an analysis of the social and technical entities into and out of the program, implementation is shown as an emerging socio-technical network. By emerging, the network is growing rapidly, but the stability of the connections that hold the network together are still being

worked out. This article highlights the reciprocal relationship between the social and the technical entities that hold the network together, whereby the technical entities are responsive and representative of the social entities within the network, and vice versa. Based upon historical documentation and interviews with two key stakeholders with a long term involvement with the program, the analytic procedure re-traced the major adjustments that occurred during this program over time. This study contributes to the overall thesis by providing an illustration of network convergence and divergence. That is, when actors adjust to accommodate interests different from their own, interests are in alignment and the network is converging, however, when actors do not have an interest to make such accommodations, interests are not in alignment, and the network is diverging (i.e. a program can rupture or break apart).

The second article seeks to identify some of the micro-processes as described by ANT, within the focal actors' representations of their implementation activities. Essentially, the actor-network theory holds that networks are built through an alignment of interests, and as the focal actor group, nutritionists would be expected to identify a network of actors and devise strategies to align their interests to those of her own. Further, ANT maintains that strategies consist of compromises and negotiations whereby the technical attributes in the network may become translated in response to these negotiations. This study sought to describe the overall representation of the socio-technical network and the strategies used by nutritionists to stabilize this network. Data were derived from individual interviews with nutritionists with the aim of building an overall representation of the program according to the ANT conceptual framework. This study contributes to the overall thesis by applying some of the notions from the moments of translation in order to describe the substance of what lies 'in-between' connections.

Lastly, a third study aims to describe the practices corresponding to the nutritionists' representations of program implementation and explain their interplay with the school context. Guided by the collective representations which formed the results of article two, article three describes the operation of these strategies in terms of practices observed during the delivery of the nutrition workshop. Data are thus derived from the individual interviews, observations and audio-recordings from the

nutrition workshop activity. This article aims to highlight the interpretive nature of practice whereby interventionists strategize according to the conditions within a setting in order to obtain (or maintain) the interest of education stakeholders. This study contributes to the overall thesis by describing practices in terms of their interaction with particularities within a setting.



## LITERATURE REVIEW

This literature review critically examines research evaluating health promotion program implementation in the school setting. Challenges facing this endeavor are reviewed with respect to the conceptualized nature of the health promotion program and the implementation frameworks which follow these conceptions. Due to the pervasiveness of the diffusion of innovation framework in public health intervention research (Love, 2004; Oldenburg & Parcel, 2002; E. Rogers, 1995; Steckler & Linnan, 2002), particular attention is attributed to evaluation models which objectify the health promotion program as a pre-defined fixed 'technology' with health promoting potential. Some examples of this type of school based program which have been extensively researched include the Children and Adolescent Trial for Cardiovascular Health (CATCH) (Johnson et al., 2003; Nader et al., 1999), the Take Five (Anderson et al., 1998) or Five-a-Day programs (Baranowski et al., 2000). The aim of this review is to: 1) challenge the approaches which have dominated implementation evaluation of health promotion programs in general and school-based nutrition interventions in particular and; 2) identify the consequences of research based on implementation frameworks which neglect the central role of social actors and their agency during program implementation.

Implementation research which follows the diffusion of innovation models typically traces program practices in order to confirm the operation of the program's theory as represented in a logic model. In this respect, research is limited to identifying only those programmed actions which conform to pre-defined plans. As a result, implementation research may miss operations resulting from the adaptation practices necessary for program implementation. The diffusion framework is problematic in that it suggests program actors are passively transmitting the program's innovation(s) without actively subscribing to an assigned role (Latour, 1987). While the potential that an actor may adapt an innovation or their role in it is sometimes (E. Rogers, 1995) but not always (E. Rogers, 2002) recognized, focus is clearly placed upon speed and extent of diffusion (Oldenburg & Parcel, 2002). Similarly, evaluation researchers remain divided on the need to consider program adaptation (Blakely et al., 1987; Castro, Marrera, & Martinez, 2004; Dusenbury, Brannigan, Falco, & Hansen, 2003). In fact, some researchers reject the need for a pre-defined theory all together (Scriven, 1991). Thus while adaptation is a known

reality once programs enter 'real world' settings, it is nonetheless associated with a 'debate' or a 'tension' between maintaining strict integrity to the theoretical proposition versus favoring adaptations in the operation of that theory in response to the context (Mowbray, Holter, Teague, & Bybee, 2003; Summerfelt, 2003). This review examines this debate as it relates to the settings approach and health promotion in schools. This review describes this tension as a form of paradox in program evaluation and attributes it to a 'default' reliance on an implementation framework which is devoid of actors. Although this framework does not conform to the theoretical principles of health promotion practice, or the 'real life' experiences of program evaluation, it is selected due to a lack of a suitable alternative.

This review begins by exploring the evaluation literature specific to school health. The literature suggests that implementation models may not reveal effective strategies to build the school's capacity to promote health, and consequently, high quality programs may go unrecognized. Despite recognition that these models do not adequately respond to the particular evaluation needs of the settings approach to health promotion (Poland, Green, Rootman, 2000) we find few alternatives (Rootman, Goodstadt, Potvin, & Springett, 2001). Arguing further, the literature review turns to systematic reviews on health promotion programs in schools, and draws upon anomalous findings and the conclusions offered by authors, suggesting a need for a new implementation framework. Next, the review presents the two implementation frameworks which currently guide most health promotion evaluation, namely, the diffusion (E. Rogers, 1995) and ecological frameworks (Scheirer, 1981). While the two models each take a distinctive approach to program implementation, they remain within the diffusion model perspective. In this respect, one model centers upon the instrumental components of the program and the other, on the organizational systems which receive the program. Both models however, are limited in that they do not capture the interplay between the program and the context, thus neglecting a program's dynamic. The final part of the review situates the conceptual framework and methodological approach used in this thesis within the social science and qualitative research literature specific to program evaluation. By identifying the ontological and epistemological assumptions that underlie current approaches to evaluating the health promotion program, the review situates the present study within an alternative paradigm, known as critical realism.

## 1. School health promotion

School health promotion is generally distinguished between a *health promotion in schools* approach and a *health promoting schools* approach (Lister-Sharp, Chapman, & Stewart-Brown, 1999; Stewart-Brown, 2006). Identified as the Health Promoting Schools (HPS) or Comprehensive School Health Program (CSHP) (Deschesnes, Martin, & Hill, 2003), the *health promoting schools* approach is distinguished from the *health promotion in schools* approach by its holistic, integrative strategies which pay particular attention to the social environment of the school (Allensworth & Kolbe, 1987; Parsons, Stears, & Thomas, 1996). The HPS and the CSHP are underpinned by the settings approach endorsed by the Ottawa Charter, in particular, to build healthy environments and reinforce local action (Green, Poland, & Rootman, 2000; WHO, 1986). The *health promoting schools* approach reflects a conceptual shift from disease prevention focused on individual lifestyle factors to the broader social and environmental determinants of health. The settings approach can be identified by three key characteristics: 1) an ecological and holistic approach focusing on building health as a resource for daily living rather than for the prevention of disease risk factors through linear causality reasoning; 2) a systems approach where the setting is conceived as dynamic, interacting, complex and interconnected with other systems within a wider environment; 3) an organizational development approach where the integration of new programs necessitates a recognition for, and integration of, the core operating and routine functions which characterize the setting (Dooris, 2005). As elaborated by others, success is associated with the integration of health promoting principles into school routines in addition to the normative systems of operation over time (St Leger, Kolbe, McCall, & Young, 2007). The objectives of the *health promoting schools* approach are thus intimately connected with the social context of the school, and in this light, responsiveness to environment (i.e. adaptation) is essential (Poland, Frohlich, & Cargo, in press).

In contrast, health promotion in schools centers activities, usually classroom based instruction, on a particular topic related to physical or mental health (Lister-Sharp et al., 1999; Stewart-Brown, 2006). Examples include nutrition, physical

activity, tobacco use, substance misuse, and social integration. This approach explicitly identifies a single population health problem and aims to change the prevalence of associated risk factors. As opposed to schools seen as settings where health is ‘created and lived’, schools are primarily viewed as venues or sites to instruct and/or motivate a large ‘captive audience’ towards healthy lifestyles or risk reduction behavior (Stewart-Brown, 2001). This approach is often valued as a program that produces short-term ‘visible’ changes in individual behavior and/or the factors which are thought to mediate this change, including individual knowledge, attitudes and capacities (St Leger, 1999). Programs of this nature have also been characterized among education scholars as representing a narrow and decontextualized “programs and packages perspective” (Elias, Zins, Craczyk, & Weissberg, 2003, p. 306) and among school health scholars as “add on extras” susceptible of being excluded from constrained financial plans or timetables (Nader et al., 1999, p. 247). In this light, a successful school-based program is one which would have a positive effect on student health or risk related behavior. Demonstrating effectiveness also requires that school conditions be identified for their mediating role to influence program implementation and outcomes.

## 2. Beyond the rhetoric: distinguishing health promotion in schools and health promoting schools

Research evaluating the implementation and/or effectiveness of *health promotion in schools* and the *health promoting schools* approaches, reveals that in practice, the distinction between the two is not always clear. The *health promoting schools* approach (that is, HPS and CSHP) “has been legitimized more through an act of faith than through rigorous research and evaluation studies” (St Leger, 1997, p. 100). This sentiment continues to be re-iterated in the health promoting schools literature today (Deschesnes, Martin, & Hill, 2003; Inchley, Muldoon, & Currie, 2006; Leurs, Bessems, & Schaalma, 2007; Whitelaw, Martin, Kerr, & Wimbush, 2006). While specific directives encourage planned actions directed at three domains, including: 1) a formal health curriculum; 2) physical and social school environment, services and policies; and 3) partnerships between the community and the school (Allensworth & Kolbe, 1987; Parsons et al., 1996), strategies predominantly focus upon the health curriculum (Deschesnes, Martin, & Jomphe

Hill, 2003; Stewart-Brown, 2006). Furthermore, despite being identified as a settings approach which values actions directed toward creating health promoting conditions, evaluations have tended to rely on individual measures of health knowledge, attitude and capacity (Lee, St Leger, Cheng, & Team, 2007; Moon et al., 1999; Mukoma & Flisher, 2004; Schagen et al., 2005), often neglecting change in social conditions (Deschesnes, Martin, & Jomphe Hill, 2003). St. Leger (2007) concludes “most evaluations in the last decade appear to be focused on health behavior change” where “not many look at the changes in schools’ policies and practices that enhance health” (St Leger et al., 2007, p. 121).

Most distinguishable in the *health promoting schools* approach is that schools are “encouraged to identify their priority areas...depending upon local circumstances” (Mukoma & Flisher, 2004, p. 359). Health promoting schools thus plan and implement one or more of the three health promoting school domains according to their particular circumstances. In contrast, the *health promotion in schools* approach tends to impose a pre-defined health topic. Some examples of disease prevention programs targeting elementary school children include: Child and Adolescent Trial for Cardiovascular Health (CATCH) (Parcel et al., 2003); Pathways (Lytle et al., 2002); Take-Five (Anderson et al., 1998); Paths (Kam, Greenberg, & Walls, 2003); Kahnawake Schools Diabetes Prevention Project (KSDPP) (Potvin, Cargo, McComber, Delormier, & Macaulay, 2003); and Planet Health (Wiecha et al., 2004). School-based disease prevention programs are often planned by expert committees and based on one or more behavior change theories which accompany a health education curriculum, new activities, and policy and food service change. Programs of this nature may also be multi-component, and include components which cross subject areas, link to family and/or community (Parcel et al., 2003) and target change at the school social or physical environment (Lister-Sharp et al., 1999). Further, and perhaps more in line with what has been defined as the essential feature of health promoting schools (Inchley et al., 2006), the planning and implementation process of a topic-based program is collaborative (i.e. include community agencies and school personnel using a teamwork approach) and described as proceeding through an iterative process (i.e. planning framework adapts to the implementation realities as they adapt to new planning frameworks) (Inchley

et al., 2006; Laurence, Peterken, & Burns, 2007; Naylor, Macdonald, Reed, & McKay, 2006; G. Patton et al., 2006; Ward et al., 2006).

In line with the distinctiveness of these approaches, distinguishing implementation frameworks may be expected to follow. Namely, since the integrity of the planned activities is a key component to behavior change theory, implementation frameworks would likely consider the social, cultural and political issues of the school in order to determine their potential to interrupt the expression of the underlying theory. In contrast, the implementation framework following the HPS and CHSP approaches would identify social, cultural and political contextual issues in terms of their influence on program formation and on environmental change and partnership-building which enhance health. However, as will be shown, this distinction is not clearly articulated or practiced across the two approaches to health promotion.

### 3. Implementing the health promoting schools approach

While the process of planning and implementing the *health promoting schools* approach is “critical to its success and sustainability” (Rowling & Jeffreys, 2006, p. 706), little knowledge has been generated in this respect (Deschesnes et al., 2003). Knowledge gaps particular to the health promoting schools strategies include the process of engaging school actors and negotiating the integration of health promotion and education goals (Deschesnes et al., 2003). Without such knowledge, the essential features which define the settings approach in theory are unlikely to be put into practice. Evaluations of health promoting schools have tended to simplify, or edit out ‘complex variables’, relationships and structures and thus fall back on familiar health behavior indicators (Colquhoun, 2006; Dooris et al., 2007). Evaluations of this approach are particularly challenging when considering the ecological complexity of the setting, the level of integration and reduced visibility of the ‘program’ in question (Dooris et al., 2007). Dooris and colleagues (2007, p. 339) paraphrase McLaren & Hawe (2007) stating that “an ecological perspective focuses on the interactions and interdependence between different elements within ecosystems, highlighting the relationships between people and settings”. However, while the integration of goals and interests from health, educational and community

actors arguably lies at the heart of this approach, few studies report on the way planning and implementation processes negotiate interests among these actors.

Evaluation frameworks providing measures of the school environment with 'school health profiles' or 'quality practices' have been used for health promotion evaluation purposes (Lee, Cheng, & St Leger, 2005; Moon et al., 1999). These indices are based upon measures from social contexts of schools and are used to evaluate the degree to which the schools are implementing health promoting strategies (Lee et al., 2005). Measures of the social context are reportedly derived from the education literature on effective schools (Moon et al., 1999). Award schemes have been used to acknowledge accomplishments of schools to implement change in the "culture and organization of the school" with respect to building links with the wider community, teaching methods, student participation in decision making and school management practices (Lee, Cheng et al., 2007; Moon et al., 1999). Evaluation frameworks of this type include measures from multiple perspectives and account for the experiences of student, staff and parents with the implemented change processes (Lee et al., 2005). These approaches represent important advancements in evaluation research that go well beyond a restricted view of the classroom as a setting to deliver health curriculum to a captive audience and the school environment as a setting where healthy policy or services allow 'healthier choices to become easier choices'.

Although these indices may point to indicators of success, it is also essential to identify the social processes which may have brought them about. Namely, this evaluation framework does little to respond to the gaps in knowledge as identified by Deschesnes (2003) with respect to the processes of engagement, negotiation and compromise in which program promoters must engage with key actors in the implementation context. Evaluations of the health promoting school social context have been based on check-lists and questionnaires with general inquiries about "family involvement in school activities" or the school social environment with respect to its "friendliness, care and trust(fullness)" (Lee, Cheng et al., 2007, p. 753). Such checklists may however limit understanding on the social process through which schools build healthy environments and engage local actors (Denman, 1999). These indicators may also be misleading. In particular, the nature of 'collaborative



partnerships' may not truly reflect the health promoting principles of 'empowerment' or the presence of actions in response to locally identified needs (Deschesnes, Martin, & Jomphe Hill, 2003; Marshall et al., 2000). For example, partnerships between community and school may be more oriented toward resource acquisition where 'partners' may not even be working together to carry out joint activities (St Leger, 1998). Further, the compatibility of actors' self-defined roles, and those of others, may be 'glossed' over as long as relationships remain superficial. For example, teachers' perceptions of parents as playing a uniquely one-sided support role, may clash when parents are put in a position to voice their expectations of a reciprocal relationship with teachers (Shartrand, Weiss, Dreider, & Lopez, 1997) as seen in the work of Deschesnes and colleagues (2003).

#### 4. Implementing the health promotion in schools approach

Implementation of topic-based programs is generally concerned with fidelity measures that trace 'program drift' as a threat to the program's potential to be effective. Programs of this nature tend to be defined and implemented by actors from outside the school who attempt to impose or sell program objectives on school actors (usually teachers). The problems associated with these programs in terms of low implementation and sustainability are well known in both education (Tanya, 2007; Lochman, 2003; Elias et al., 2003) and health promotion (Gingiss, Roberts-Gray, & Boerm, 2006; Parcel et al., 2003) literatures. However, little knowledge has been produced regarding what the program represents to these actors, and why they may become involved at one point or cease to do so at another point. In this respect, the identity of actors during program implementation tends to be portrayed along a single dimension, namely as either conforming or not conforming to a newly program-defined role. In contrast, health promotion interventionists have been shown to interpret their role in relation to their areas of expertise and the social context of their school (MacDonald & Green, 2001). Often, the role of the program and how it responds to a need is similarly assumed to be consistent among all actors. However, school actors may differ on their views of the program's objectives and how these are expected to interact and bring about a change. For example, despite evaluations revealing the ineffectiveness of the substance misuse prevention program DARE, schools continued to implement the program, leading investigators to

question why school actors have an interest in an ineffective program. Findings revealed that school actors had very distinct ideas of ‘effectiveness’, what the program represented and ‘essential’ features of the program (Birkeland, Murphy-Graham, & Weiss, 2005). For example, school actors valued program objectives (i.e. developing relationships with community actors, such as police officers and other community service-providers) which were not part of the official program.

Several topic based programs addressing deviant and risk behavior (G. Patton et al., 2006) general healthy lifestyles (Naylor et al., 2006), nutrition (Inchley et al., 2006; Laurence et al., 2007) or physical activity (Ward et al., 2006) approach program planning and implementation as processes of integration. Implementation thus becomes a process whereby the program becomes interpreted and integrated into the school’s core mission and value systems. For example, Inchley and colleagues (2006) described the implementation process of a healthy eating strategy which was not based upon a pre-designed protocol. In addition to taking into consideration changes resulting from healthy eating environments, the implementation evaluation documented how schools came together to devise and implement plans. The study revealed differences among schools with respect to collaboration and described the successes and challenges due to the inclusion of a variety of actors (i.e. external professionals, pupils, parents). Schools which succeeded in integrating the initiative with the daily life of the school were identified in order to build alliances with key players, allocate roles and establish effective communication channels. These schools were also more likely to increase the availability of healthy eating alternatives and improve awareness and attitudes concerning healthy eating among staff and pupils. Other ‘packaged’ nutrition education programs emerging from locally identified problems and strategies to address obesity issues among primary schools have also been associated with positive effects upon nutritional status (Veugelers & Fitzgerald, 2004).

Another topic based study (i.e. physical activity and adolescent girls) focused the implementation evaluation on the team building process among project interventionists, school administration and teachers (Ward et al., 2006). Key to the findings of this study was a relationship between flexibility and the implementation of program components (e.g. curriculum could be integrated into PE classes, biology

classes, consumer science classes), school determination of environmental changes, and positive perceptions among education stakeholders for the long term integration of the program. While the success of the program was attributed to the use of an implementation model which followed schools through their own transformations of the program, details on how the staff negotiated these transformations were not documented.

#### 5. Identifying the need for a new implementation framework for health promoting schools

The need for an alternative implementation framework within school-based health promotion programming is apparent. Current implementation frameworks “fail to do justice to interventions” (Mukoma & Flisher, 2004, p. 365) by neglecting the change processes in schools (Mitchell, Palmer, & Davies, 2000, p. 245). In their review assessing the effectiveness of health promoting schools, Mukoma and Fisher (2004) identified the need for evaluation to use broad categories to address outcomes, such as school structure and organization, communications, health-related policies, and school management. In their review, the authors found a great number of healthy behavior indicators at the individual level but measures of structural change were overwhelmingly absent, leading the authors to emphasize “the need for further research on evaluation methodologies for health promoting schools” (Mukoma & Flisher, 2004, p. 366). In this respect, evaluation lacks a methodology to monitor the “synergy created by integrating components” (Rowling & Jeffreys, 2006, p. 708). In so doing, the evaluation ignores the culture and context within which schools as organizations operate, improve and change, how teachers judge and change practice, as well as the constraints imposed by the internal structure of schools (Rowling & Jeffreys, 2006).

Beyond the particularities of a program’s conceptualization of health, whether it be rooted in social determinants, based simply upon one or several risk behavior topic(s), programs become part of the social relationships which exist within the context of the school, and thus require that people and their relationships change. It is these change processes which are at the heart of the settings approach to health promotion (Dooris, 2005) and pose unique challenges to evaluation

(Whitelaw et al., 2006). While no suitable implementation framework has been proposed for health promoting schools, current frameworks that emphasize individual health outcomes appear to be inappropriate to detect new “combinations and connections” arising from health promotion action in school settings (Rowling & Jeffreys, 2006, p. 709). Consequently, when the program has not been sufficiently tested due to failed implementation (i.e. a Type III error), evaluations of the effectiveness of health promotion programs risk producing false conclusions of program failure (Basch, 1985).

## 6. Effectiveness of health promoting strategies

A large body of empirical evidence suggests that program adaptation may in fact be associated with positive effects on health related outcomes. A review of fifteen systematic reviews on health promotion practices in schools suggests that the process of implementing a program had more bearing on individual health indicators than the particular premises underlying the program theory (Stewart-Brown, 2006). The review’s findings were based upon fifteen systematic reviews (n=760 ‘sound’ controlled trials) on a range of topic specific programs including mental health, substance misuse, healthy eating and physical activity, eating disorders, injury prevention and a health promoting schools approach. The exact indicators used by the review to assess effectiveness were not specified nor were the details of implementation indicators. However, authors concluded that “programs developed and implemented using approaches common to the health promoting schools approach, including, involvement of whole school, changes to the school psychosocial environment, personal skill development, involvement of parents and the wider community, and implementation over a long period of time” (Stewart-Brown, 2006, p. 16) are effective. Although the evidence as presented here (and available in the published report) is limited in detail, other reviews support the conclusions of this review; namely, programs implemented according to the health promoting schools model tend to demonstrate effectiveness (St Leger et al., 2007, p. 111):

“Recent evidence suggests that the way the school is led and managed, the experiences student have to participate and take responsibility for shaping

policies, practices and procedures, how teacher relate to and treat students and how the school engages with its local community (including parents) in partnership work, actually build many health protective factors and reduces risk taking behavior” (p. 111)

Further, reviews specific to topic based programs aiming to prevent obesity among elementary school children similarly suggest a connection between the implementation of programs and their potential for successful effects upon students (Doak, Visscher, Renders, & Seidell, 2006; Summerbell et al., 2007). For example, based on their findings that ineffective nutrition education programs had higher fidelity to essential criteria than effective programs, the authors concluded that “whether or not a study addresses diet and activity may be less important than how the intervention addresses diet and activity” (Doak et al., 2006; pg. 126). In particular, program effectiveness, based upon statistically significant differences between the program and comparison groups according to the height/weight measures (i.e. BMI), skin-folds or both, was not found to be associated with implementation criteria used to assess fidelity. The seventeen (n=17) effective programs had lower duration, were less likely to intervene in specific and well defined risk factors such as diet and activity, less likely to target the physical environment, less likely to include the broader community, less likely to target family-level factors, and less likely to link sectors, than the eight (n=8) non-effective programs (Doak et al., 2006).

Moreover, the most recent Cochrane review on programs on obesity prevention in children concluded that programs that involved stakeholders in the planning and implementation of ‘strategies’ are more likely to create a supportive environment for sustained action and positive impact than are programs which approach gold standards for judging program effectiveness (Summerbell et al., 2007). A gold standard refers to the presence of an experimental research design that can rule out other explanatory factors which can account for a causal relationship between the treatment and the measured effect. The gold standard for assessing causality is the randomized control trial. Other reviews on school-based nutrition programs have recognized the importance of involving education actors with the planning and implementation of the program, suggesting that this

involvement, together with the decision making process, can have important implications on the ability of the program to reduce risk factors associated with obesity among children (Flynn et al., 2006; Knai, Pomerleau, Lock, & McKee, 2006).

The conclusions of these reviews are particularly interesting as they come from a paradigm which values research design for its capacity to maximize internal validity and control. Experimental research designs consider context “as a source of potential confounders that need to be either ‘factored in’ (as variables that apply across cases) or ‘factored out’ (‘controlled for’ statistically or through study design such as randomization) and thus tend to ignore the relative importance of social context” (Poland et al., in press). Instead, the conclusions of these reviews suggest that the quality of implementation may be best judged by the degree to which the program becomes interwoven with the context. This dovetails with arguments advanced by health promotion evaluation researchers who argue that evaluation frameworks which serve the needs of clinical medicine and disease prevention but not those of health promotion are inappropriate (Springett, 2001).

The advantages and disadvantages of different research methodologies are actively debated among health promotion researchers (Hawe, Shiell, & Riley, 2004; McQueen, 1998). While this discussion is beyond (and outside) the scope of this review, it touches upon one relevant point. While implementation evaluation has been traditionally conceptualized as a means to ensure that both the program conditions and the program delivery are ‘under control’ and that conclusions based on effectiveness are not subject to Type III Error (i.e. the false conclusion that a program has been ineffective, when the program has been inoperative) a concomitant recognition is beginning to appear that in fact, context matters (Basch, 1985). Namely, neither the inter-relationship between context and program nor the influence context can have on markers of program success are negligible. It seems that perhaps the more the research design controls for environmentally mediating ‘confounding,’ the less it may be able to generate knowledge regarding the mechanisms which may explain program effectiveness.

## 7. Measuring program implementation through fidelity or integrity criteria

Implementation evaluation is often identified as a means to uncover the program in practice. Measuring these processes is recognized as advancement within program evaluation, where programs cannot be assumed to operate as 'black boxes'. The term black box is applied to program evaluation by means of criticizing outcome evaluations which assume, without empirical support, that programs are practiced according to a plan or theory. However, while the literature on program evaluation concurs on the need for implementation evaluation, the same cannot be said with regard to the role implementation evaluation should play. Fidelity of implementation is the "bridge between a promising idea and its impact" where it aims to build knowledge on how programs can achieve effectiveness when they are disseminated (Dusenbury et al., 2003, p. 238). In general, fidelity or integrity includes measures such as adherence to the program, dose (amount of the program delivered), quality of program delivery, participant responsiveness and program differentiation (whether critical features that distinguish the program are present). Still however, a number of important problems are associated with the conceptualization and measurement of fidelity, including an under developed methodology, weak measurements, and poorly standardized and under validated measurement approaches (Dusenbury et al., 2003).

Fidelity of implementation is also the subject of a longstanding debate. After thirty years, the tension continues between the need for fidelity versus that of adaptation (Castro et al., 2004), where "local adopters change (reinvent) innovative model programs to fit their local needs and provide a sense of ownership" (Blakely et al., 1987; E. Rogers, 1978). The fidelity-adaptation tension involves two competing aims, namely, to find universal mechanisms of change and implement them consistently, and to design programs which are responsive to local needs. The debate resounds with policy makers of a practice which is to 'reinvent the wheel' in the face of incommensurable evidence on program effectiveness (Pawson & Tilley, 1997), whereby, to be effective, local action needs to take into consideration the collective experiences of others, but only in so far as it corresponds to their own circumstances. Nonetheless, program adaptation is pervasive and the challenge for implementation research lies in the development of "science-based strategies that

regulate adaptation to avoid decrements in effectiveness based on haphazard or inappropriate program adaptations” (Castro et al., 2004, p. 41).

Program implementation streamlines inquiry to provide normative assessments regarding the accuracy of practices or the degree to which the program is being practiced as planned (Love, 2004). However, the practical application of this concept with regard to program implementation is not as straightforward, where “the conceptual activity around developing fidelity criteria needs much more attention” (Mowbray et al., 2003, p. 325). In an extensive review on fidelity criteria in the health and education literature, Mowbray and colleagues (2003) bring the usefulness of fidelity to bear by challenging the utility of an implementation measure rooted within a normative concept. Basing their review on the development, measurement and validation of fidelity criteria, the authors provide a critique of conceptual relevance and operationalization of fidelity criteria by posing questions such as ‘fidelity to what?’, ‘according to whom?’ and ‘for what purposes?’. Some key issues which pull the utility of fidelity criteria in many opposing directions include: who should determine the essential program components and how they are measured, how well such measures capture the operative mechanisms, and what fidelity represents in terms of program outcomes.

Of particular interest in this review are findings showing that studies of fidelity have overwhelmingly depended on program structure and neglected change process. As a result, complex program components reflecting values and principles have been omitted. The authors of this review argue that these program components are perhaps more important to program outcomes than structural conceptions of program operations (i.e. adherence to the program, dose, quality of program delivery, participant responsiveness and program differentiation). The review also identified the need for fidelity measurements which can be modified over time and space in order to follow the dynamic nature of programs, noting that too often fidelity measures are set too early where their relationship to the programs’ outcomes may change over time. Namely, complex programs depend upon practitioners’ decisions, thus individualizing practices to meet multiple needs and the structural characteristics of a setting. These programs are likely to feature a certain level of program ‘drift’ or ‘leakage’ where pre-determined program activities cannot



be consistently implemented as intended across sites (Mowbray et al., 2003). In this light, it is recognized that programs usually need to undergo periodic adaptations in response to changes in client needs and in the context of varying resources and opportunities, which suggests that events may be spontaneously introduced or removed.

#### 8. Measuring program implementation by building consensus

A growing body of literature suggests that multi-perspective fidelity criteria are more likely to be sensitive to the operative mechanisms, particularly those associated with program outcomes (Mills & Ragen, 2000; Summerfelt, 2003). Decisions regarding what was of value would consider data from official documentation, key informant interviews, focus groups, and ethnographic observations. Similar to the process described by Chen (1990) this 'stakeholder' approach suggests that a consensus can be reached among various program stakeholders and participants. Namely this approach values the perspectives of the practitioners, decision makers and participants to identify how a program operates. Distinct to the process described by Chen (1990) however, recent discussions of fidelity criteria emphasize the interactive and dynamic nature of program theory where fidelity criteria may differ between settings and change over time (Mills & Ragen, 2000; Mowbray et al., 2003; Summerfelt, 2003). Thus, the multi-perspective fidelity criteria advanced by these authors appears to be less concerned with an overall global responsiveness than with a responsiveness which is sensitive to variations occurring across implementation settings when a multitude of perspectives meet and change over time.

Discussions in the literature, however, appear to favor the development of consensus. One key challenge of this approach refers to the difficulty of consensus building in terms of the desirability and possibility of building consensus among actors with different degrees of power (Greene, 2006). Tools to build consensus revisit the premises of participatory action research (Nastasi et al., 2000) and aim to engage various stakeholders through negotiation and the creation of shared meanings (McDonald & Viehbeck, 2007). While such tools convey implicit value associated

with building partnerships, negotiation and common meanings, details regarding the substance of such maneuvers among the various actors are scant.

Building a program theory (and consequently implementation measures) from the perspectives of stakeholders has been acknowledged as offering evaluators a framework suited to maximize the utility of evaluation results (Chen, 1990). While this approach is associated with a set of criteria with which to judge validity and rigor (Guba & Lincoln, 1989), its relativist approach has nonetheless been criticized (Potvin, 2004). Basing its epistemological framework upon social constructivism, this approach does not seek to build knowledge about programs which could be generalized beyond the particularities of the contexts (Pawson & Tilley, 1997).

#### 9. Theory driven evaluation

The evaluation literature describes a shift in the late 1980s from a pre-occupation uniquely concerned with demonstrating the causal connection between the program and the intended outcomes, to understanding the mechanisms or the processes underlying program effects. This shift to an emphasis on understanding how a program works and what makes a program work, led to the development of the theory-driven approach to program evaluation (Chen, 1990; P. Rogers, 2000; Shartrand et al., 1997; Stufflebeam, 2001). A program theory is defined as a set of propositions that describe a particular program, explain why, how, and under which conditions program effects occur, predict program outcomes, and specify what is required to bring about the desired program effects (Sidani & Sechrest, 1999). A program theory is described as a combination of descriptive, explanatory and prescriptive, practice-oriented theories (Chen, 1990). Explicitly outlining the program theory is a key part of program evaluation in that it prevents 'black-box evaluations' and thus improves social practice by discovering gaps between the program-in-theory and the program-in-practice.

The evaluation of program theory in practice often comprises six program theory elements (Lipsey, 1993) or program theory domains (Chen, 1990). Lipsey refers to a problem definition, mediating processes, expected output, exogenous

factors, critical inputs, and implementation issues. Chen (1990) refers to the treatment, implementation environment, outcome, impact, intervening mechanism and generalization domains. The problem definition provided by Lipsey (1993) “specifies what condition is treatable, for which population, and under what circumstances” (p. 11) and is similar to what public health planning refers to as the social and epidemiological diagnosis (Green & Kreuter, 1991). Critical elements identify what needs to be done and how often (i.e. the total dose of the services, activities or procedures) to produce the expected outcomes. Within the PRECEDE/PROCEED model of health promotion for example, critical elements in a planning model would address the enabling, facilitating and reinforcing factors which underlie a health problematic (Green & Kreuter, 1991). Mediating processes describe the chain of events which are expected to occur as a result of the critical elements being in place. They are described as a set of preconditions leading toward the ‘ultimate’ outcome which is expected to occur as a direct result of the operation of the critical elements. Exogenous factors describe anything that might occur along the way of program delivery which will affect the ability of the ‘treatment process’ but which cannot be controlled by program developers, such as facilities, training of personnel, or organizational factors. Implementation issues refer to “aspects of the treatment delivery system relevant to its function of providing the specified treatment” (Lipsey, 1993, p. 11); that is, what the critical elements actually look like during their delivery after having been possibly ‘interrupted’ by exogenous factors.

Theory driven evaluation aims to surface any number of links which are part of the “chain assumptions” underlying program action(s). This process is a means of rendering visible the program’s ‘mini-theories’ for two purposes: first, to inform program specific action and second, to provide knowledge which can be generalized to program evaluation outside the particularities of a specific program on the mechanisms of change (Birckmayer & Weiss, 2000). Here the social science approach to building program theory maintains that evaluations should be based on existing social theory in order to advance knowledge (Chen, 1990). Alternatively, programs are described in terms of experience, practice knowledge, and intuition, and are applied by practitioners who are not necessary able to articulate the conceptual foundations of what they do (Shartrand et al., 1997). In this respect, a

program theory is described as a “hypothesis on which people, consciously or unconsciously, build their program plans and actions” (Weiss, 1997, p. 503).

Implementation theory is a distinguishable part of the larger, more encompassing program theory, where both the program and implementation theories contribute to the program’s over-riding ‘theory of change’ (Weiss, 1997). Implementation and program theory are respectively defined as “what is required to translate objectives into ongoing service delivery and programme operation” and “the responses of the people to programme activities” (Weiss, 1995, p. 58). Program theory then refers to the hypothesized causal links between mechanisms operated by a program and their anticipated outcomes, and is “more concerned with the psychological and motivational response leading to behavior change” (Blamey & Mackenzie, 2007, p. 446). Although when we consider that people (e.g. planners, practitioners, stakeholders and participants) actively involve themselves in a program’s plans and actions as opposed to passively receiving or enacting the program operations, the distinction between implementation theory and program theory begins to blur. In some respects this distinction revisits a criticism raised by Chen (1990) who stated that where program evaluation tends to “look at what programmes do to the clients from different points of view – but assume(s) that the programmes are some how given” (Shaw & Crompton, 2003, p. 195).

While it is clear that programs are based upon the actions of people inadequate attention is given to these actions. Namely, as suggested by Chen (1990) and reiterated by Shaw and Crompton (2003), insufficient attention is given to theorizing program operations. Along these lines, while surfacing the programs’ ‘mini-theories’ for the purpose of knowledge generation is an important part of program evaluation, this has been problematic, where a lack of knowledge produced from program evaluation is acknowledged (Pawson & Tilley, 1997; Weiss, 1998). This argument is particularly the case with respect to implementation where it is described as a phase which occurs after the theory has been developed, and as providing situational feedback about how the program is operating (Weiss, 1997). For example, while program planning includes many different actors with varying professional savvy, experience, intuition and beliefs, little theoretical development has been aimed towards explaining how this range of perspectives comes together

and how they might differentially appear in practice. In this respect, while the importance of social theory is recognized, its emphasis seems to have been placed upon the ‘causal’ program theory and neglected how social theory can improve the theory of planning and implementation.

Indeed, the propositions which link the various elements of a program theory typically take a deductive approach (M. Patton, 1997) and draw upon academic theory and research to develop a “causative theory” (i.e. what program designers and practitioners intend) (Chen, 1990). In this respect, the program theory prescribes normative practices. However, as a theory of action, program theory also must consider the operations which occur in practice (Friedman, 2001). Friedman (2001) identifies practice as having two dimensions, that is, first by what people intend or believe they do and second, by what can be inferred from their actual behavior. Espoused program theory refers to what people intend to do, their perceptions of what they are doing and why they are doing it and reflects an inductive approach to developing program theory described by Patton (M. Patton, 1997). A “theory-in-use” is inferred from actual behavior (Argyris & Schon, 1974) and reflects a “user-focused approach” that attempts to extract the theory of action implicit in the actions of program users (M. Patton, 1997, p. 219). Thus, in order for program evaluation to uncover gaps between program-in-theory and the program-in-practice, clarity is important regarding whose theory of practice we discuss and from where this theory was derived. According to Friedman (2001) this lack of precision has been an important weakness in theory-driven evaluation, where “jumping from the espoused logic model to the measurement of outcomes risks seeing and measuring only what is in the logic model, while ignoring aspects of program theory-in-use that have critical impact on performance” (p. 163).

## 10. Theory of implementation

There is a clear acknowledgement in the program evaluation literature that the program-in-practice is unlikely to conform to program-in-theory. It has further been recognized that the two may inform one another (i.e. program operations can be adapted to fit the theory or theory can be adapted to fit the program operations) (Weiss, 1998). Currently however implementation theory does not capture this

iterative process but instead tends to use the program-in-theory as a normative prescriptive measure of what the program-in-practice should look like. Theory of implementation often resembles what is commonly referred to as the theory of diffusion or diffusion of innovation theory (Oldenburg & Parcel, 2002; Steckler & Linnan, 2002). The diffusion of innovative ideas began as an area of inquiry concerned with the successful transfer of innovations from their conception and development to their eventual adoption in the field. In this case, an innovation is defined as an idea, practice or object that an individual or other 'unit of adoption' (e.g. organization or setting) perceives as new while diffusion on the other hand, refers to the process by which an innovation is communicated through certain channels over time among members of a social system (E. Rogers, 1983). The process of diffusion is broken down into five stages : innovation development, dissemination, adoption, implementation, and maintenance (Oldenburg & Parcel, 2002).

The use of the *diffusion of innovation theory* in health promotion program implementation can be traced back to the study of the factors which facilitated or impeded the adoption of health services in schools (Coombs, Silversin, Rogers, & Droletter, 1981; E. Rogers, 1983). Following the diffusion model, the implementation of disease prevention programs in schools was first described as a 'technology-push' (Coombs et al., 1981). The diffusion of innovation model identified two distinct systems which were concerned with implementation of a prevention program; a 'resource system' or group of innovators (e.g. health services) and a 'user system' or group of adopters (e.g. schools). The innovation was identified as 'pushed' when the primary impetus driving the adoption decision was the availability of the technology. In contrast, when a particular advancement in technology followed the identification of a problem, it was described as being 'pulled' by the user system. Public health programs were 'pushed' into schools based upon public health interests. Although such technology was recognized to be unsustainable, its implementation was perceived to be unproblematic due to the nature of the technology (Coombs et al., 1981; Scheirer, 1990). Health education programs were described to be unproblematic because they did not entail change in organizational routines, roles or relationships. In contrast to expectations, schools did not uniformly adopt health technologies, and research shifted its focus to include

factors outside the technology itself (e.g. ease of use, trialability, relative advantage, newness) to identify factors from the organizational environment (i.e. 'user system') which enhanced or impeded the successful implementation of an innovation (Scheirer, 1987).

This distinction between a user system (i.e. context) and resource system (i.e. innovation) continues in public health implementation research. Public health program evaluation has typically focused upon the latter (i.e. innovation) with a pre-occupation placed upon testing the ability of state-of-the-art programs or best-practices based upon behavior change theory, to reduce the prevalence of a health determinant (Steckler & Linnan, 2002). Although implementation evaluation, defined as "the degree to which a studied intervention was implemented as designed" (White, 2004, p. 118) is recognized to be an important component in public health program evaluation, outcome and impact measures are commonly reported in the absence of process or implementation all together (White, 2004). The continued presence of 'black-box causality' thus continues to be problematic in the public health program literature (Love, 2004). When the implementation is documented, it is frequently measured as the program 'backdrop' where variations are 'flattened out' in order to compare treatment effects across settings (Blamey & Mackenzie, 2007, p. 441). Here, implementation research identifies the factors 'outside' the program and determines how they influence program intake (i.e. recruitment), acceptance, and outcomes (Love, 2004).

Increasingly, public health program evaluation is adopting a "transparent box paradigm" (Love, 2004, p. 65). The perspective which is most often called upon to describe the user system (i.e. context, setting) comes from the work of Scheirer (Roberts-Gray & Scheirer, 1988; Scheirer, 1981, 1987, 1994) who integrated a range of theoretical perspectives to identify and describe the factors within an organizational system which could influence the implementation of a program. This model describes an organization's functioning in terms of levels (i.e. macro, intermediate, micro) and guides implementation research to identify the factors within each of these levels as facilitating or constraining the adoption of a program or an approach to promoting health (Richard et al., 2004). Context is thus identified

as essential to program implementation where it can be the key to uncovering the circumstances in which, and the reasons why, a particular program works.

This approach parallels the ecological approach to health promotion which aims to impart change at various levels within a given user system (Richard et al., 2004). Such an approach requires an implementation model where changes in the context (or user system) are recognized as key outcomes either implicitly or explicitly (Gambone, 1998). Scheirer's (1987, 1994) systems perspective provides an in depth account of the various factors, ranging from the decision making process to individual abilities and interest, which operate within the settings often targeted by health promotion (e.g. schools, hospitals, governmental agencies). This model thus serves to expand our perspective of what implementation research can accomplish, in that it does not need to be exclusively fixed upon the identification of deviation for the purposes of correcting program delivery or for controlling variation during analysis of program impact. Here, program implementation research aims to enhance understanding of why the program may or may not have been implemented as intended (Scheirer, 1994).

By identifying the program as embedded within a complex, interactive and dynamic environment, the systems perspective of context challenges a definition of implementation research which is uniquely normative. It further incites questions related to practices within implementation evaluation which are based on isolating program components from the context. In so doing, the systems perspective assumes that these components, despite having been integrated into a system, remain as entities which can be measured in isolation. This literature review thus suggests that a pre-occupation within public health research to isolate and control program components, may have blocked, and perhaps distorted our ability to understand what a program becomes while being practiced.

## 11. Knowledge about the nature of health promotion programs

A health promotion program is derived from the actions of people and the enactment of objects which work together to form an organized or 'programmed' (Dab, 2005) set of activities. A health promotion program can thus be conceived as



a set of connections between people, knowledge and material resources whereby such connections are perceived as offering new, updated or improved means to addressing population health problems. Knowledge as to the nature of health promotion programs has generally focused on demonstrating whether or not such programs work, where a program that works can be shown to be effective (i.e. achieve its objectives). Little knowledge, however, has been developed regarding how programs are built and maintained through connections among people, knowledge and material resources. A general lack of attention regarding the nature of the health promotion program is identified as problematic as it inhibits our ability to question the assumptions upon which we have built our understanding of programs, how they operate and their potential to improve public health (Potvin, 2004). In other words, our understanding of the program and how it operates is a function of the tools we use, from where our chosen tools are derived from our world view or paradigm. Taking a closer look at the object of evaluation studies (i.e. the program) and how we construct knowledge about it, has been proposed as a way to go beyond simply developing new tools which reiterate underlying assumptions (Springett, 2001; Potvin, 2004). By way of advancing understanding on the nature of programs, Potvin (2004) describes three ontological paradigms for programs: empirical realism, idealism (or relativism) and critical realism.

The empirical realism ontological paradigm purports that a constant and predictable objective reality exists outside human awareness. Knowledge can be gained about this reality through scientific methods, leading to true, pure knowledge on the object of study. Science offers observers a neutral and objective lens through which they can observe or discover empirical instances tantamount to reality. A research design or evaluation framework which follows empirical realism ontological principles places particular value in the internal validity of the hypothesized relationships, whereby identifying and controlling for extraneous 'competing' explanations is imperative. This paradigm is more appropriate for the evaluation of clinical medicine or disease prevention treatments, and less appropriate in the case of health promotion programs. Its lack of appropriateness is described in detail by Springett (2001), who defines health promotion as a "decision-making process involving a number of key agents" (pp. 140) and the program as a form of praxis. Applied to a health promotion program, an ontological framework which

neglects its social nature by assuming that it can be ‘controlled’ or ‘predictable’ risks deriving faulty conclusions about it. This paradigm has been criticized by Latour (1999) for neglecting the social dimension of knowledge, where it assumes that objects in and of themselves can be factual. This faulty assumption as interpreted by Latour, is paraphrased by Potvin (2004) as “knowledge is in the object...facts are facts, they speak for themselves; scientists are only passive and neutral intermediaries between nature and the world of humans” (p. 733).

The appropriateness of this ontological paradigm for the evaluation of programs in general has been questioned (Potvin, 2004). The problem with this paradigm lies in the attribution given to the program theory and the logic model as representations of the program built outside the program context. Building a program’s model in this way imposes roles and relationships to program actors without their active involvement. Actors are represented as ‘objects’ and their practices as ‘instruments’ and thus this model arguably neglects their autonomous intentionality (Schwandt, 2005). Program theory and the links that it proposes are viewed as true representations of what happens in a program. This representation of a program has similarly been associated with an erroneous assumption that programs have ‘lives’ of their own (Chen, 1990).

In contrast, the relativist ontological paradigm pays particular attention to the representations which are held by the social actors (i.e. stakeholders) involved in the program. This ontological paradigm holds that law-like regularities which are part of the physical world do not exist in the social world. In this light, the social world lacks an ‘objective’ truth or one ‘true’ reality, and instead knowledge and truth is the result of perspective. The program or the program theory is defined based upon these representations which are “ideal constructions elaborated by social actors as reflections of their views of reality” (Potvin, 2004). Here, the problematic situation and the organization of actions and activities which respond to it, are defined by the interpretations or ‘espoused theories’ held by the various stakeholders. Programs are thus represented by one or more of these theories which may be negotiated among the concerned stakeholders.

The use of this ontological paradigm for the evaluation of programs has been critiqued. On the one hand, social scientists critique this ‘stakeholder’ approach for inappropriately constructing a program theory on ‘untrained’ observations or ‘hunches’ (Chen, 1990). By describing this approach as “the inquirer’s construction of the constructions of the actors one studies” (Schwandt, 1994, p. 118) it is suggested that this approach offers little in terms of knowledge which can be generalized beyond the study context (Connell & Kubisch, 1998). Interestingly however, some program evaluators who identify themselves as social constructivists, aim to “understand people’s constructions of meanings in the context being studied, because it is these constructions that constitute social realities and underlie all human action” (Greene, 2007, p. 986). This interpretation of constructivism implies the presence of some form of social regularity and thus acknowledges the presence of a social structure, suggesting that objective knowledge of social reality can be acquired.

As an “organized effort to change the course of development of some object over a period of time” (Dooris et al., 2007, p. 4), the object of health promotion program evaluation must, arguably, consider the action which forms this ‘organized effort’. Springett (2001) argued that as a form of praxis, a health promotion program evaluation framework should focus on actions which include learning and decision making. Also interpreting a health promotion program as an instance of praxis, Potvin (2004) identifies critical realism as a suitable ontological perspective to generate knowledge on health promotion programs. According to critical realism, social processes (i.e. structures and mechanisms) have causal law-like properties which are not directly visible but are rather perceptible only through the influence they exert upon social episodes, patterns or events. These structures and mechanisms are not constant nor are their interactions and the products of such interactions sequential or predictable. They are dynamic whereby, “humans, in their conscious activities, unconsciously reproduce and occasionally transform these structures” (Bhaskar, 1998, p. 35).

Unlike the idealist ontology, the critical realist perspective holds that the actions, decisions and learning which comprise the stakeholders’ practices are not entirely situational or context dependent. That is, social patterns and regularities

operate beyond the perceptions and control of the various stakeholders. As explained by critical realism, “the (social) world should not be conflated with our experience of it” (Pawson & Tilley, 1997, p. 11). Unlike constructivism, critical realism does not hold that human experience accounts for all possible underlying social processes which could predict certain occurrences or events. Critical realism argues that “the world is characterized by emergence” where causal powers which lie within the social structures can be either “activated or remain dormant” (Pawson & Tilley; 12).

Programs and the health problems they address are thus understood as manifestations of these underlying social processes, and as such, our ability to control programs and predict their relationship to health problems is fallible. Instead, the manifestations of these social processes are studied through praxis which is “both work, that is, conscious production, and (normally unconscious) reproduction of the conditions of production, that is society (Bhaskar, 1998, pp. 34-35) . Praxis refers to human action in the natural and social worlds and emphasizes the transformative nature of action. Praxis captures the relational or dualistic dimension of society and human agency whereby human action manifests itself through dialogue between the self and the other. Similar descriptions of the health promotion program are found in the literature whereby internal mechanisms are recognized to develop *in situ* as a result of “naturally occurring events and influences in the setting or environment” whereby the program theory emerges from the “dynamic contexts of practice” (Hawe et al., 2004, p. 789). These interpretations lend support to the appropriateness of the critical realist ontology to inform an evaluation framework for health promotion.

Finally, based upon a predominant belief that health promotion programs, like health technologies, are unquestionably the latest or best solution to a health problem, health promotion programs are commonly assumed to have a self-evident value (Lehoux, 2006). Resistance or poor compliance to such technological change is interpreted as resulting from a ‘deficit’ within the user system, often related to a community’s (lack of) ‘readiness’ or (poor) organizational ‘capacity’. This assumption that health promotion technologies or innovations are value free or neutral is challenged when technology is understood to be the product of social

practices, operating within normative frameworks where certain values are privileged (Lehoux, 2006). Health promotion programs are laden with overlapping and possibly competing perspectives on ‘the good society’ and how this can be achieved (Shaw & Crompton, 2003). Understanding the effectiveness of health technologies in general, and health promotion programs in particular, needs to go beyond a piecemeal assessment based upon quantitative measures and “consider how technology is used, perceived, and valued” (Lehoux, 2006, p. 42).

## 12. Theoretical Framework

The theoretical framework proposed by this thesis is elaborated from a conceptualization of a health promotion program as a type of health technology or innovation (Lehoux, 2006). In contrast to a conceptualization of an innovation which becomes implemented through the ‘trajectory-type’ approach advanced by the diffusion model, (E. Rogers, 2002) a health promotion program is not perceived as having a ‘life’ of its own (Chen, 1990), with ‘movement’ independent of the actions which become enacted by actors. In other words a health promotion program is not conceived as a collection of services and resources which are ‘automatically’ placed into action by a group of actors who follow an innate and invisible wisdom embodied within a program. Following from the work of Lehoux (2006) the premise of this thesis is that a health promotion program, like a health technology, is ascribed meaning through use, whereby its use (or lack thereof) contributes to its form. Thus, health promotion programs exist only insofar as there are people creating meaning around them. That being said, a health promotion program is not conceived as an entirely socially constructed entity; non human entities such as planning models or the physical layout of a setting inform the social construction of a health promotion program. In other words, the actions taken by people (in relation to the program) are facilitated or impeded by the material and objective entities that comprise the physical environment (i.e. non-human entities).

This conceptualisation of a health promotion program is not counter to empirical descriptions found in the literature. People involved with programs may be described by the nature of their disease risk, age, gender, professionalism, expertise, or experience. Similarly, things, through representations of state-of-the-art

knowledge or usability, are often identified in relation to people in terms of providing access to a certain target group, or being accessible based upon a group's intellectual capacity or financial abilities. However, the frameworks used in health promotion do not organize these 'entities' such that their associations or connections to one another can be identified and understood. In other words, we lack a theoretical framework to understand what makes a group of human and non-human entities work together. We thus turn to the empirical and theoretical work of a discipline devoted to studying the constitution of technology (or innovation): the Social Studies of Technology (SST). This theoretical framework is suitable to expand our analysis of a health promotion program beyond a normative dichotomy which leaves little room to account for the role of people's actions vis-à-vis the implementation of a health promotion program. Such an expanded framework is particularly relevant to the field of health promotion given health promotion's core values focused on people and their interaction with a program.

Following our contention that non-human entities also form the program and interact with human activities, we select a theoretical framework which is unique within the SST discipline and accounts for the dual composition of health promotion programs. Namely, the Actor-Network Theory (ANT) proposes the socio-technical network as a concept to explain the constitution of innovation or technology where the network is conceptualized as a set of coordinated movements or negotiations between both human and non-human entities (Akrich, Callon, & Latour, 2002; Callon, 1986; Latour, 1987).

The Actor-Network Theory (ANT) directs the study of social phenomena to the formation of 'the social' and argues that too often sociologists assign identities to social groups rather than allowing them to define themselves (Latour, 2005). In this respect, ANT asserts that identities or the defining qualities of a group do not appear by an unseen force of nature or society, nor do they 'reside' within the social groups themselves. Instead, social identities take form through the 'work' (i.e. interpretations, translations, negotiations) of forming networks of relationships which arise for different objectives. Social identity is thus viewed as a result of the networks to which an actor becomes associated, where identities are as fixed (or as dynamic) as the networks to which the actor belongs. Networks are thus described

as emergent when identities are dynamic and relatively unstable, and as stabilized when the identities are relatively certain and relatively fixed. Individual actors thus participate in a multitude of different networks, and networks are not defined by the presence or absence of any individual actor. Thus, while an empirical study guided by ANT may focus upon one network, an actor's identity in relation to it may be more or less defined by their existence outside and prior to their engagement with this network.

The network approach is described as providing a suitable conceptual apparatus to study society as 'becoming' rather than 'being' (Cooper & Law, 1995, p. 238). To the extent that implementation means creating a social reality of programs through organized action, the ANT is proposed as an appropriate theoretical framework to study the process of program implementation. By adopting this perspective, our approach moves beyond an assessment of implementation based on the performance of pre-defined roles, and instead focuses upon the 'becoming' of roles and identities during the implementation (or practice) of the program. In this light, the performance of roles which support the goals of the program can be thought of as "something that emerges from and is sustained by a network of personal relationships and activities" (Cheetham, 2001, p. 5). We propose program implementation as a process of expanding and stabilizing a socio-technical network.

An analysis of the implementation process guided by the ANT theoretical framework is also appropriate as it offers an explanation of why human and non-human entities might come together (and stay together) such that an innovation becomes operative. Studying the constitution of technology or "innovation in the making" focuses our attention to the "mechanisms of failure and success (making them) intelligible, and ultimately, more manageable" (Akrich et al., 2002; pp. 191). By following interactions and their immediate results, the implementation process is not limited to *doctus post factum* accounts, or to a retrospective explanations where the story is told through the bias of how it ended (Akrich et al., 2002).

Human and non-human entities become intimately connected within the network where their roles and positioning within it are co-dependent; one cannot be discussed without reference to the other. Incorporating this co-dependence into our

analysis of program implementation is particularly interesting for its potential to expand our understanding of what constitutes a context and how it interacts with the program. In contrast to an analysis of implementation based upon diffusion, an ANT analysis would not distinguish the ‘contextual’ entities from the ‘program’ entities; an innovation becomes the associations between these human and non-human entities. An ANT analysis can however pay particular attention to the decisions made by the user system to adapt an innovation (Akrich et al., 2002). Addressing this issue of context responds to a need to better describe implementation processes which correspond to the settings approach. In this respect, health promotion evaluation is struggling to identify the object(s) of evaluation and legitimate actions which capture health promotion principles (Rootman et al., 2001). Our analytic framework thus considers ‘entities’ from both the physical and social environments similarly, or as symmetrical, as opposed to dichotomized as objects and subjects.<sup>1</sup>

Networks like innovations are built out of a need to resolve or improve a practical situation. The success of the innovation depends upon how well the human and non-human entities come together and work as ‘allies’. ‘Allies’ or ‘intermediaries’ behave in a way which stabilizes the network, thus permitting its operation. Both human and non-human entities are referred to in ANT terminology as ‘actants’. Networks are thus defined by the establishment of connections among human entities, as well as between non-human and human entities. Both types of relations occur “in the context of social acts in which persons relate to all kinds of objects as vehicles or as producers of signs, which the person interprets and responds to out of habit at one extreme, or in some original, reflexive or creative way at the other” (Cohen, 1989, p. 192).

By using the same vocabulary for human and non-human entities (i.e. ‘actants’), ANT identifies actants as having the potential to influence the actions of each other and as contributing to the stabilization of a network. An ‘actant’

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<sup>1</sup> In contrast to a practice which dichotomizes object and subject as asymmetrical, ANT describes non-human and human actors using the same vocabulary in order to emphasize their symmetry. Symmetry is a fundamental principle in ANT, where human and non-human entities are mutually constitutive and thus can only be explained in relation with one another.



becomes enrolled as an ally in the network, and in so doing is 'interested' in taking on the role to which it has been attributed. In so doing he, she or it contributes to stabilizing the network where the larger the network of allied 'actants', the more stable a network becomes. An example often given where a human actor supports a 'fact', is the referencing system (Risan, 1997), whereby, the author enrolls another author to support a statement. Enrolling empirical data to claim or disclaim a hypothesis is an example of enrolling a non-human entity. Just as a network can describe the inner 'workings' of an innovation, technology or program, it can similarly describe a fact (such as a new idea) or an artefact (such as a tool). The importance is that the power of influence or durability of any fact, artefact, innovation or technology lies in the stability of the connections between its constitutive human and non-human entities; its network. According to ANT, no artefact operates independently, and no fact stands alone: truth and utility emerge through the stability of a network.

Both a network as a whole, as well as the human and non-human entities of which it is comprised, are described in terms of their ability to 'behave' in ways which are expected. When an entity does not take on the role assigned by the network a 'controversy' occurs, and this results in the emergence of an otherwise 'silent' entity from the network. An entity that emerges as a controversy behaves like a 'mediator', where a 'mediator' does not behave in a way that is expected or anticipated. For example, in the program providing the context for this study, parents acted as volunteers during the nutrition workshops and helped the nutritionist with the basic functioning of the activity. Parents as volunteers are no more than assistants, and as long as they conform to this role, we do not necessarily pay a lot of attention to them. However if a parent acts in a way that is not in conformity to the anticipated role, we are obliged to pay more attention. A parent may exercise her motherly role with a child or a friendly role with other parents. Mothers may not simply assist an older child through a task, but rather, take control of a challenging task and in so doing, reduce the child's autonomy (and perhaps pride of accomplishment). When focused on being friendly or developing social affinities, parents may inadvertently forget about their role as assistants and disrupt lessons by chatting amongst themselves. Non-human entities similarly stand out when they do not play the role given to them. For example, a portion of the food prepared by the

class was given to children to take home and share with their families. The take-home food sample may, however, become an object of trade, get eaten before it goes home, be forgotten or accidentally (or purposefully) thrown away.

In ANT terminology, when human or non-human entities play their anticipated roles, they act as ‘intermediaries’ and when they do not, they act as ‘mediators’. The intermediary’s role becomes fixed when this role conforms to their own interests as well as to the interests of the network. Entities have innate properties determining, to a certain extent, what they can or cannot, will or will not, do. Human entities have innate properties referring to their capacities, goals or objectives and their interests can be explicit or implicit. By conforming to the interests of the network, an entity’s own interests correspond with the interests of the network, which is working to resolve a particular issue. Human and non-human entities can likewise be connected together in manners that respond to the interests of some entities but excludes others. A network can be understood to have interests in reference to its operation toward the resolution or improvement of a problem, whereby a network operates through the interests of the enrolled entities. For example, when parents reveal their interest to develop social affinities or to act in ‘motherly’ or protective ways they act as mediators and introduce a controversy. However, as long as parents are interested in restricting their roles as assistants and do not interfere with the functioning of the workshop (and thus challenge its capacity to reach a goal) they are identified as ‘intermediaries’. As long as the recipe interests the students, where the majority appreciate its taste and are capable of interpreting and carrying out its procedure, the recipe acts as a mediator.

As revealed in the above example, an entity’s role as ‘intermediary’ or ‘mediator’ is not fixed. Entities thought of as ‘intermediaries’ (i.e. as playing a fixed role) can reveal themselves as ‘mediators’ (i.e. as in the case of parents revealing themselves as mothers and friends). Likewise, ‘intermediaries’ can become ‘mediators’. In fact, this ‘movement’ from having a role which is not fixed, in terms of contributing to the goals of a network, to one which is fixed, lies at the very heart of ANT. By becoming a ‘intermediary’ an entity becomes ‘enrolled’ in a network and in so doing, plays a contributory role to the overarching goal of the network. This is also referred to in ANT as the act of ‘interessement’ or ‘translation’

whereby an entity can become persuaded to play a role in conformity with the goals of the network or alternatively, the network can adapt or modify itself in a way that it adapts to the new entity. For example, perhaps by talking to the parents, and reminding them of their ‘hands-off’ role during the workshop and how, by playing this role, they are building their children’s sense of capacity and self esteem (which is ultimately their own goal as well) the parents may begin to behave more like ‘intermediaries’. Likewise, by personally distributing the take-home samples at the end of the day to the children, the nutritionists might subvert other ‘competing’ interests of students which would prevent the sample from reaching their homes. Also by using recipes that have been extensively tested with children with consistently available and accessible ingredients, nutritionists increase the chances that the recipe will perform as expected during the nutrition workshop (i.e. it will behave as an ‘intermediary’).

An entity can in fact be ‘dissected’ into smaller properties whereby it can be analysed as a network. Likewise, a network could simply be an entity. As long as an entity behaves as an intermediary, dissecting it into a network of entities has little utility. An entity or a network which functions as expected is referred to as a ‘black box’. A ‘black box’ refers to a system with an inner functioning which is of little importance. In other words, we do not need to pay any attention to it because it behaves in a predictable and consistent way. We need simply be aware of what goes into a black box and to anticipate the result: we lift the lever of a switch, and the room becomes illuminated; we turn the key of our car ignition and the engine starts; we don’t pay a parking ticket and we get a letter from the city. The functioning of the ‘black box’ is a result of the connections which characterize its socio-technical network. The more a network is composed of stable connections, the more it becomes consolidated, and thus has a ‘black-box’ type of functioning. According to Latour, black boxes are extremely uncommon (Latour, 1987). Within the field of health promotion program evaluation, it is generally agreed that programs are not black boxes in that they do not function in unison as one entity whereby implementation evaluation aims to identify variations in the program by ‘unpacking’ the black box.

According to the interpretations provided by Latour however, health promotion program evaluations have limited their ‘unpacking’ to definitions of the social and technical entities as intermediates (i.e. smaller black boxes). In this respect, inputs specific to either the setting (e.g. the size of a school) or the program (e.g. the gender of participants; years of experience of health practitioners), are considered to be sufficient to define or understand the nature of implementation outputs such as the comprehensiveness, duration or participation. This analysis proposes to further unpack the black box of program implementation and in so doing defines the human and non-human entities as mediators and thus as complex entities with multiple implicit and explicit interests.

In contrast to a consolidated network (i.e. black-box type functioning), a health promotion program corresponds most accurately to what has been identified by ANT as an ‘emerging socio-technical network’. The ANT analytical framework focuses on the processes through which an emerging network may become consolidated. The process of becoming consolidated is captured in the formation of connections between human and non-human entities that become ‘enrolled’, that is, entities that can become ‘interested’ in playing ‘mediatory’ roles which conform to the goals of the network. The ‘movement’ by which entities become ‘enrolled’ and thus contribute towards the stabilization of a socio-technical network is referred to as an act of ‘translation’ or ‘interessement’. The term ‘translation’ refers to the process of ‘interesting the otherwise uninterested’. Namely, forming connections between the various human and non-human entities’ interests and capacities underlies a fundamental *modus operandi* of socio-technical network creation and expansion. Callon (1986) identifies this over-riding process as the sociology of translation, whereby a translation represents “a shared desire to arrive at the same result...creating convergences and homologies by relating things that were previously different” (Callon, 1999, p. 187).

Both human and non-human entities participate in acts of ‘translation’. They can both become ‘interested’ in and ‘enrol’ in the goals of a socio-technical network. In terms of the scenario outlined above, as nutritionists described the role they hoped the parents would assume, they described this role in terms of something that parents want for their children (i.e. an increase in their child’s self esteem). Similarly, by

testing recipes using different combinations of ingredients before deciding upon a final recipe, nutritionists are ‘enrolling’ food items to combine with one another in a manner which is most agreeable to a child’s palate. The more nutritionists succeed in ‘enrolling’ both human and non-human entities to form connections which are aligned with their aims to peak an interest among children in food, nutrition or healthy eating, the more the connections within this network are stabilized and the network consolidated. The nutritionists essentially try to persuade as many entities as possible to behave as black boxes.

When a health promotion program is created outside or independent of the setting, the challenges of program implementation can be understood in terms of the destabilization of otherwise relatively stable networks. For example, operating in the confines of an office, a nutrition intervention (such as the one providing the context for this study) successfully enrolls nutrition and food information, educational materials, food items, cooking materials and professional savvy, to achieve a clear healthy eating message, a tasty recipe and an interactive, fun educational game within a one hour and a half. The classroom also functions based upon a clear set of relationships which become destabilized with the introduction of a new socio-technical network. When this network is enacted in the classroom, it introduces a new set of relationships between human and non-human entities. For example, the use of time, availability of materials, the authoritative role of teacher or the input (or interruptions) from teachers, parents and students, can introduce new restrictions and opportunities regarding how the entities relate to one another. During program implementation, previously unknown entities reveal themselves and known entities reveal themselves in new ways.

Implementing a health promotion program therefore suggests that practitioners accept to destabilize previously defined relationships between the entities of their program and rebuild anew. Likewise, people who receive a program are open to develop new or redefine old relationships. Practitioners responsible for the implementation of a health promotion program (i.e., the nutritionists) are therefore in a precarious position whereby according to ANT, the success of their innovation (i.e., the nutrition education program) lies in the alignment of interests with entities whose need for the innovation is uncertain (in this case teachers,

students, parents). It follows from this theory, that practitioners who act as good negotiators, that is, make strategic compromises and effectively convince other human and non-human entities to become interested in the program, are more likely to effectively implement a health promotion program. In such circumstances, through time, some entities may become black boxes.

Program implementation is then, the displacement of program entities (social and technical) by program interventionists with the aim of establishing connections in the formation of a socio-technical network. The 'displacement of entities' implies that the form of the entity and its role is not fixed (i.e. mediators). That is, the identity of the actors in the network has not been agreed upon by all the entities and goals can be negotiated. Mediators' actions in the network are thus unpredictable. Mediators can engage in the work of negotiating their place or role through acts of translation or dissociate from the network all together. While the program interventionists may aim to establish connections and form alliances in order to build a network, the entities with whom they aim to forge alliances may not have an interest in contributing to this network. The sociology of translation as developed by Callon (1986) outlines the strategic movements through which innovations hold together, or form a collection of entities whose interests are aligned. In this respect, translation describes the compromises and negotiations which take place in order to enrol and maintain an alignment of interests among the social and technical entities.

### 13. Limitations of Social Studies of Technology and the Actor-Network Theory

Using the Actor-Network Theory (ANT) as a theoretical framework for implementation evaluation opens it to the criticisms which have been directed at the Social Studies of Technology (SST) as a whole (Winner, 1993) and ANT in particular (Collins and Yearley, 1992). Interestingly, one of the principal critiques aimed at ANT is associated with the role attributed to non-human entities, where ANT has been critiqued as ascribing non-human entities conversely too little (Winner, 1993) and too much (Collins and Yearley, 1992) of a role in its analytic accounts of technological developments. Readings on this subject divulge a

longstanding debate concerning the role attributed to Nature and Society, subject and object, human and non-human, to understand and explain technological events, discoveries and change. This dichotomy is played out in SST with respect to the attribution allotted to non-human entities or objects to influence the actions of human entities. On the one hand, falling within the discipline of SST, ANT is associated with an analytic tradition which adopts a social constructivist stance, and is criticized as having “little concern for the ways technologies transform personal experience and social relations” (pg. 369). Here, social constructivists are criticised as viewing technology simply as a means to apply knowledge, whereby acknowledging the ways non-human entities come together to influence human thought and activities is high-browed as a kind of “intellectual slumming” (pg. 365) (Winner, 1993).

On the other hand ANT is criticized for attributing non-human entities agency. That is, for ANT the non-separation of the Subject and the Object, Society and Nature, humans and things is an important part of sociology. The major criticism of ANT is that it has introduced symmetry between humans and non-humans, by anthropomorphizing things, and by objectifying humans. Introducing the same language to describe humans and non-humans (i.e. referring to both as ‘actants’) thus giving agency to nature, is criticized as a misconceived extension of symmetry, whereby humans are taken out of their pivotal role. Sociologists thus prefer to reject any differentiation between social and natural explanations of natural phenomena, maintaining that all claims (independent of whether they turn out to be true or false) are social. Here, Nature is recognized as playing no role in outcomes, but is the consequence of social agreement, not its cause. This is held as an important principle among sociologists as a means to undermine the privileged authority of natural scientists to say what things really are.

In essence, the ANT theoretical framework responds to critiques targeted toward the social constructivist stance of the SST by rejecting the dualism between the role of humans and non-human in forming society, but in so doing, is open to a critique from within the SST discipline, regarding its anthropomorphizing analytic practice. The ‘middle ground’ stance offered by the ANT in considering both human and non-human entities in the implementation of a health promotion program was

found to be highly relevant and appropriate. First, a social constructivist perspective is appropriate to studying health promotion programs due to the relatively little attention attributed to practice, which goes beyond an instrumental description. In SST terminology, our knowledge of practice has been overwhelmingly derived from a technological determinism stance toward health promotion programs (i.e. human action as determined from or structured by technological advancement). That is, programs are perceived as being predominantly knowledge and expert driven, whereas practice, or the operations which describe the operation of a programs protocol, are understood predominantly in terms of compliance. The appropriateness of integrating a social constructivist view of the program is supported by empirical evidence on fidelity and integrity demonstrating that human actors are unlikely to comply with program protocol.

Second, a theoretical framework which concomitantly integrates non-human entities is highly relevant for a theoretical framework to guide the study of program implementation. We cannot ignore that programs are composed of non-human entities with roles that should not be taken for granted. By considering non-human entities in this way, we recognize that non-human entities constrain or facilitate human activities unexpectedly, and also, that these entities are products of social interests. Moreover, leaving room for non-human entities to exert an influence on the implementation process, acknowledges the potential of influence from mechanisms beyond the awareness and/or control of those who are directly involved with the program.

Epistemological concerns aside, studies subsumed under SST have also received methodological and teleological criticisms. By basing analysis of a given technological device uniquely upon the 'relevant social groups', SST risks selecting key social groups which have been excluded (deliberately or not) during the construction of technology. In this light, it has been suggested that SST suffers from the problem of elitism, whereby the range of technical possibilities is skewed to favour certain social interests. Along similar lines, in understanding the role of actants in the formation of a technology, ANT does not render explicit how the proposed analytic tools allow power differentials between actants to be identified and accounted for during negotiations for inclusion or exclusion in the network.



Both SST and ANT, are thus criticized for a general disregard of how, through processes which are innate to the social constitution of technology, social hierarchies, injustices, and exclusions are maintained. In this respect, while the SST may offer to describe the construction of technology, it does not offer judgement or concern for the consequences of such development.

On the one hand, we concur with these arguments, and recognize the value of producing knowledge about how, through their constitution, health promotion programs could potentially maintain or re-produce social inequalities in health. We agree with this argument and note that health promotion researchers, like social scientists of technology, spend seemingly little time pondering the full spectrum of the consequences of their innovations. Further, by incorporating this sociological perspective, we risk offering limited advancement to health promotion goals in this respect. On the other hand, we find potential with the lack of a normative framework as offering advantages to the study of program implementation. When normative frameworks are applied to health promotion programs, they typically assess human actions in relation to objectives which are 'innate' to a program created *a priori*, leaving little room for the inclusion of practical or less formalized theories of change. Perhaps, by incorporating ANT we give credence to a practice within health promotion program implementation which seeks to expand participation such that the program can represent a wide range of interests and incorporate local knowledge and know-how.

While building an argument for the conceptual relevance of ANT is not without its challenges, the challenge of using the concepts presented by ANT and building an operational framework is almost insurmountable. The terminology found within the ANT literature not only lacks precision but can arguably at times, be found as contradictory between authors. That is, the boundaries between its terminology are not necessarily clear. Case studies using ANT do not provide detail on their analytic work and thus they provide little guidance as to how the key concepts can be clearly identified in the collected data through analytical procedures (i.e. operationalized). Finally, a methodological account of how the authors came to their interpretations does not appear in the empirical work supporting this theory.

#### 14. Parallels between ANT and other applicable social theories

Alternatives to the ANT theoretical framework may also have provided informative interpretations of program implementation. Within health promotion evaluation, Hawe & Riley (2005) apply the Ecological Theory framework with the aim of expanding knowledge of the interactions which occur at the intervention-context 'interface' (Kelly, 1979; Trickett & Birman, 1989). Similar to ANT, Ecological Theory takes a systems perspective whereby people and things connect to one another, and aim to reach an equilibrium. An intervention thus implemented into a new system needs to make a contribution to the functioning of that system and adapt to its social (i.e. norms and values) and technical characteristics (i.e. language and technology).

The discipline of community psychology or social psychology also offer a large range of theoretical alternatives to ANT which, like ANT are rooted within semiotics. Symbolic Interactionism, for example, looks at the process of interaction in the formation of meanings for individuals (Blumer, 1986; Goffman, 1959) and thus may have guided an interesting study on how nutritionists variously assigned meanings and roles to teachers, communicated these meanings which were derived from their expectations of how teachers can and should behave in relation to the nutrition intervention. Further, Watzlawick (1967) offers a theoretical perspective explaining how communication patterns can be effective or ineffective change mechanisms. Program implementation then might have centred more upon how, through interactions with teachers, nutritionists succeed or failed to create shared meaning of the nutrition intervention within and across schools.

From within the discipline of Social Studies of Technology, alternatives to ANT could also have served suitable toward the study of program implementation. Theorists including Bijker (1987) and Pinch (1984), similar to Callon, Latour and Akrich, offer a methodological framework through which the constitution of technology can be studied through an analysis of sociotechnical systems. Similar to ANT, facts and artefacts are understood to have different meanings and interpretations across different social actors. However, this perspective, identified

as adopting a social constructivist view of technology, focuses upon the social context(s) within which a technology is embedded. Here, the meaning of the technology is uniquely interpreted based upon the characteristics of the social actors. How social actors' defining characteristics are themselves consequent to technical systems is not addressed. Thus, the ANT theoretical framework also considers that meanings attributed to facts and artefacts are concomitantly defining the social actors who attribute this meaning in the first place, and in this respect, the relationship between technical and social systems is inter-dependent.

#### 15. Operationalization of ANT to our case study on program implementation

Within this expansive field of SST and ANT we have aimed to extract a small, manageable and useful vocabulary suited to an insightful understanding of the process of program implementation. The reader is referred to Table One, found after the conclusion of this section, for a list of twenty-three concepts from ANT which were found to have relevance for an analysis of program implementation. This table provides conceptual definitions which were extracted directly from the ANT literature, along with an interpretation of that definition as it relates to program implementation. Prior to presenting this table, we discuss a limited set of concepts which simplify and concentrate the aspects of ANT which were found to be directly useful for our case study. This relatively precise terminology has been used by Callon (1986) in his empirical application ANT.

Following our definition of “innovation” as a network of human and non-human entities whose interests are continuously becoming aligned with one another, and our understanding of these entities as mediators, we will describe the micro-processes by which a group of practitioners aimed to build a network of alliances with human and non-human entities around a particular health problematic. We thus propose the sociology of translation as outlined by Callon (1986) as an appropriate theoretical lens for analyzing the implementation of a health promotion program. The sociology of translation involves four discernible yet overlapping ‘moments’ known as (a) *problematization*; (b) *interessement*; (c) *enrolment/controversy*; (d) *mobilization/controversy*. While each of these moments

will be briefly outlined, our analysis will concentrate upon the first two moments, namely (a) *problematization* and (b) *interessement*.

*Problematization* refers to how the problem is constructed and how the focal actors in the group position themselves within it. It is identified by Callon as a process involving a ‘double movement’ where a set of entities is determined and then defined such that the focal actor group is able to constitute itself as indispensable in the network of relationships the actors are building. *Problematization* also describes the efforts made by the focal actor group to engage others in the conceptualization of the problem as the actors themselves have defined it. *Interessement* is the group of actions or strategies by which the primary actor group attempts to impose and stabilize the identity, motivations or interests of the entities they have defined through its *problematization*. For example, in the research undertaken here, nutritionists used strategies to interest those entities to entertain their goals, in favor of those of their competitors. When an entity has accepted the role and/or goal assigned to it by another entity, it has become enrolled. A controversy appears when an entity does not accept the role or goal which has been assigned to it. When an entity is displaced or has a defined role within the network, it has been mobilized and assigned a role for the contribution to the achievement of a particular goal. A controversy can also occur when the mobilized entity does not act as a legitimate spokesperson for the entity it represents.

We have found certain notions from the ANT analytic framework to be of particular use. Namely, by looking at inter-play and co-dependence between the social and technical actors, we give particular attention to the stability of connections and the role of a *primum movens* to build new connections in order to stabilize a network into a new setting. Connections are thus analyzed in terms of their strength and how through translation, a program begins by weakening its connections in order to build stronger ones with new networks. By looking at this translation, this thesis used notions of *problematization*, *interessement* and *controversy*. The notion of controversy was particularly useful as it applied to the legitimacy of a spokesperson to speak on behalf of an actor group.

Please refer to Appendices A and B for a detailed description of the program at the time of this study. The article found in Appendix A “Assessing the impact of the primary school based nutrition intervention *Petits cuistots – parents en réseaux*”. is a published article (Bisset, Potvin, Daniel, & Paquette, 2008). The article found in Appendix B “Introducing *Petits cuistot – parents en reseau* (Little Cooks – Parental Networks) a multi-faceted nutrition intervention for primary school children” is being revised for submission to the Canadian Journal of Dietetics.

## 16. Conclusions

Health promotion programs are characterized as the organized actions of a diverse set of actors who come together with the aim of improving the conditions in which they live, work or learn. These collective actions lie at the heart of building health promoting environments and local capacity. Although the goals of this approach are admittedly different from those of disease prevention, which targets individual knowledge, attitude or behavior, the legitimacy of health promotion action is often judged from the same standpoint. Health promotion maintains that while they are important predictors of health, these healthy lifestyle indicators are mediated through complex social processes which are created and maintained within and across settings. Health promotion program evaluation is thus challenged to identify the presence of these health promoting social processes. Due to a complete absence of an evaluation framework which can describe these health promoting social processes in a manner which generates knowledge, the tendency in health promotion program evaluation has been to fall back upon methodological frameworks which are unable to describe these programmed social processes.

Empirical evidence finds that programs that adapt to local conditions through a collaborative whole school approach are associated with positive health related outcomes among students. However, what these approaches look like in practice is not known. We suggest that this unknown is due in part to the lack of a suitable implementation framework which captures the social processes by which health promotion programs can become integrated into a setting. In other words, while the notion of adaptation is extensive in the literature on program implementation and it is identified as being either directly or indirectly part of program implementation

models, the models used in health promotion do not expand upon the dualistic nature of adaptation. Adaptation does not play a central role within these models and thus its essential role in program implementation often becomes overlooked. For example, Scheirer's implementation model is premised upon the systems theory where the introduction of new operations into settings such as schools, inevitably causes some degree of disruption to established routines and relationships. The diffusion model similarly describes an active user system, observing, trying out or even adapting a new innovation. However, neither of these approaches expands upon this interface where adaptations occur.

Instead, the implementation frameworks upon which health promotion relies respond to the conditions which are built from theory-driven evaluation approaches. Theories are ideal type plans whereby program operations are hypothesized to lead to a set of outcomes. Implementation then provides a framework through which these planned operations are measured, along with the conditions which may have facilitated or impeded their realization. Using the results from systematic reviews, it has been argued that this approach to implementation evaluation has provided a narrow view of program action and how it may relate to positive healthy lifestyle indicators.

The social studies of technology is then proposed as having potential to frame implementation as a social practice. Using one approach from within SST, the Actor-Network Theory (ANT), a health promotion 'technology' can be studied as consisting of both social and technical entities, and as such might prove useful to study the actions which comprise a health promotion program. The interest of using this social studies of technology to study program implementation is also justified as it provides an epistemological framework which neither holds objects or their regularities as something completely distinct or separate from human perception nor as something entirely created by human perceptions.

Table One. Actor-Network Theory (ANT) terminology as applied to a case study of health promotion program implementation

ANT Term	Definition of ANT term as found in various literatures	Application of the ANT term as applied to program implementation
Entity	<p>Are called upon by human actors by way of accounting for the how's and why's of any course of action. An entity can be either human or non-human.</p> <p>Entities can behave as either mediators or intermediaries and as such are the major source of uncertainty in an actor- network.</p> <p>Latour, 2005 (pp. 39)</p>	<p>In terms of program implementation, the entities that are referred to when accounts are given as to why a program was implemented in one way and not another. Examples of non-human entities might be financial support, material resources, or time, whereas human entities are staff, target audience, stakeholders and others</p>
Actor-Network	<p>An <u>actor</u> is an entity which can act where the source of the action is not located within the actor.</p> <p><i>"The 'actor' in the hyphenated expression actor-network is not the source of action"</i> - pp. 46 Latour, 2005 (pp. 46 – 55).</p> <p>A <u>network</u> consists of entities which are connected. It is defined by its <i>relational materiality</i> and its <i>performativity</i>. <i>Relational materiality</i> describes entities as taking form and acquiring attributes as a result of their relations with other entities. <i>Performativity</i> describes how entities get performed (and perform themselves) into relations that are relatively stable and stay in place.</p> <p>Law, 1999 (pp. 3 – 5)</p> <p>The <u>hyphen</u> defines the monistic account of the source of action which does not distinguish between sources which are human or non human.</p> <p>Latour, 2005 (pp. 46 – 55).</p> <p>Consists of three key features; - a point-to-point connection is being established which is physically traceable and thus can be recorded empirically - connections leave empty most of</p>	<p>For program implementation, the 'work' refers to practices which occur in relation to a multitude of 'actors' (human and non-human entities). The behaviour of actors is uncertain. A health promotion program, with its own set of actors, 'confronts' a new set of actors each time it is implemented in a new setting. Also, since conditions do not stay the same this work of building a network is not limited to an 'early phase' of implementation. Actors may, as any time, appear unexpectedly or behave in ways which are unanticipated. By practicing, program practitioners confront both planned and unplanned events, and for the latter, try to device solutions for using them to their advantage.</p>

	<p>what is not connected - this connection is not made for free, it is based upon labour</p> <p>Latour, 2005 (pp. 131 – 133)</p>	
Action / Act	<p>By definition, action is dislocated. If an actor is said to be an actor-network it is to underline that it represents the major source of uncertainty about the origin of the action.</p> <p>Action is attributed to agency. <u>Agency</u> is what drives an actor to act, it is the source of the action. An actor may or may not have control over the agency which drives an action.</p> <p>Agencies are identified through figures. Figures can be either human or non-human.</p> <p>Latour, 2005 (pp. 46 – 55).</p>	<p>Represents the ‘uncontrollable’ aspect which is an integral part of program implementation. In this respect, ‘action’ highlights that programs, as forms of social innovations, are complex systems. Action gives a program its form. By understanding this action as dislocated, when it does not follow what was originally planned, we may be less inclined to interpret this as a lack of integrity or fidelity. Rather, this understanding of action may drive an inquiry to understand what the program has become through this action, instead of what it was supposed to be.</p>
Socio-technical network	<p>Is an analytic tool to help describe something. Often, in ANT this tool is used to describe the success or failure of innovations. However, ANT uses the concept of the network and presence of social and technical actors as a way of explaining sociological phenomena which do not have any particular restriction.</p>	<p>Refers to the overall process by which a program becomes implemented into a setting.</p>
Emerging socio-technical network	<p>A network characterized by many weak or unstable connections whereby the durability of established connections is uncertain and the strategy by which potential allies’ interests’ can be translated is still being negotiated.</p> <p>Latour, 1987 (pp. 121-132) Akrich et al., 2002 (pp.210-211)</p>	<p>Refers to the overall processes of implementation which work simultaneously to sustain the program in a setting.</p>
Consolidated socio-technical network	<p>A network in equilibrium characterised by stabilized connections. A stable connection occurs when human and non-human entities have become enrolled and behave in a predictable way.</p> <p>Latour 1987 (pp. 121-132) Akrich et al., 2002 (pp.210-211)</p>	<p>Refers to a program which is no longer being implemented but is a fixed part of a setting. It is taken for granted, it functions like a routine. In rejecting evaluations which assume that a program functions as a ‘black box’ researchers are stating that programs are not consolidated, but rather emerging. That is, knowing what goes in, is not enough to predict what may come out.</p>



Invention	<p>Ideas, projects, plans, prototypes which have not yet met the judgement of a user.</p> <p>Akrich et al., 2002 (pp.187)</p>	<p>For program implementation this term refers to the program theory or the logical model of the program.</p>
Innovation	<p>An entity made up of human and non-human entities created by instability and unpredictability. An entity which progresses by means of decisions. Innovations are thus contrary to 'paragons of logic', order and rationality.</p> <p>Is continually transforming itself to reach new equilibriums where the feasibility of the imaged compromise is continuously tested.</p> <p>Moves via the reactions of it provokes from negotiation to negotiation and from redefinition to redefinition, everything depends of the identity of the allies who are mobilised.</p> <p>Akrich et al., 2002 (187 – 191)</p>	<p>For program implementation this refers to the process of program implementation and the adaptation of the program theory or the logical model as it is being practiced.</p>
Interests	<p>Defined as an inter-esse and as what lies between actors and their goals, thus creating a tension that will make actors select only what, in their own eyes, helps them reach these goals among the many possibilities.</p> <p>Latour, 1987 (pp. 108)</p>	<p>Refers to what an entity wants or needs, and what they are willing or able to do, in order to accomplish what it is they have in mind to accomplish.</p> <p>Refers to the range of possible accommodations that the materials or objects, and the program stakeholders can make to use or adapt the interests of other entities. We can take the perspective of either the 'user' system or the 'program' system to see how the entities from either system accommodates the interests from the other.</p>
Translator	<p>An entity bringing together two universes with distinct logics and horizons, two separate worlds, each of which would not know-how to survive without the other.</p> <p>Akrich et al., 2002 (pp. 187 – 191)</p>	<p>For program implementation the translator is an entity which is positioned between the 'user' system and the 'program' system. It is an entity with characteristics which permit it to be understood and relevant to both systems. Due to this positioning, the translator can facilitate the integration of the two systems.</p>
Translate /	The strategies by which an entity	For program implementation this

<p>Translation</p>	<p>attempts to enrol another entity where interests are used as a currency of enrolment.</p> <p>Latour, 1987 (pp. 108-121)</p> <p>The act of re-interpreting, re-presenting or appropriating others' interests to one's own.</p> <p>Has two meanings: linguistic; relating version in one language to version in another one) and geometric; moving from one place to another.</p> <p>Translation thus is the movement of distancing an entity from an original interest through the process of slowly providing new interpretations for those interests.</p> <p>Latour, 1987 (pp. 117)</p> <p>Allows the empirical examination of how an actor constructs – deconstructs Nature and Society. The 'moments' which describe the acts through which a <i>primum movens</i> attempt to enrol a set of human and non-human entities into a network.</p> <p><i>"Translation is a process during which the identity of actors, the possibility of interaction and the margins of manoeuvre are negotiated and delimited."</i></p> <p style="text-align: right;">- pp. 203</p> <p>Callon, 1986 (pp. 203)</p>	<p>refers to the processes through which the practitioners who are responsible for the implementation of a program interact with other entities in a way that these entities participate in the realization of the program goals.</p>
<p><i>primum movens</i></p>	<p>The group of actors providing the account of the socio-technical network. This group is referred to the "Focal actor group" by Callon (1986) and to "Fact builders" by Latour (1989).</p>	<p>This would be the group of human actors from whose perspective the implementation story is told. They would often be the practitioners responsible for the implementation of a program into a setting. But they could also be another group of human actors who are trying to gain support for a program.</p>
<p>Problematization</p>	<p>The moment of translation during which the <i>primum movens</i> inter-defines a selected range of entities. Inter-definitions define the identity in a manner consistent which is consistent with the interests of the <i>primum movens</i>, establishing itself as an obligatory passage point (OPP) thus "rendering itself indispensable"</p>	<p>For program implementation, this refers to the implicit strategic nature of the practice of program implementation. It directs analytic attention to the manner in which practitioners are identifying and defining people and things in terms of how the program can be of interest to them.</p>

	Callon, 1986 (pp. 203 – 211)	
Interessement	<p>The moment of translation which involves a process of convincing others through strategic acts, to accept the definition they were attributed by the focal actor.</p> <p>Callon, 1986 (pp. 203 – 214)</p>	<p>For program implementation this refers to actions taken by the program practitioner in order to maintain the interest of an existing entity or to gain the interest of a new entity in the program.</p>
Enrol / Enrolment	<p>A moment of translation whereby an entity has been successfully enlisted, interested or persuaded to participate in the construction of a socio-technical network.</p> <p>“It designates the device by which a set of interrelated roles is defined and attributed to actors who accept them. <i>Interessement</i> achieves enrolment if it is successful.”</p> <p>“Enrolment is described by the acts of negotiations, trials of strengths and tricks that accompany the <i>interessements</i> and allow them to succeed.”</p> <p>Callon, 1986 (pp. 211)</p>	<p>For program implementation a human actor becomes enrolled when they use a non-human entity from the program as part of a routine. A non-human entity becomes enrolled when it serves the program in a way which is conducive to the program meeting its goals.</p>
Controversy	<p>A moment of translation where the entities have to be re-defined, associations or connections re-negotiated.</p> <p>Callon, 1986 (pp. 214 - 220)</p> <p>What occurs when entities cannot be grouped together under seemingly coherent categories. Things that occur in the social which cannot be easily explained. The counter-intuitive nature by which an actor justifies their position.</p> <p>Latour, 2005 (pp. 1-31)</p> <p>By paying attention to these controversies, ANT claims that;  <i>“ it is possible to trace more sturdy relations and discover more revealing patterns by find a way to register the links between unstable and shifting frames of reference”</i>  - pp. 24</p> <p><i>“Controversy is all the manifestations by which the representativity of the spokesman is questioned, discussed,</i></p>	<p>For program implementation this refers to an event which did not work out as planned. Either a human entity did not behave as was expected (i.e. did not participate in an activity) or a non-human entity did not serve the anticipated purpose (i.e. understanding of what to do was not made clear by the instructions).</p>

	<p><i>negotiated, rejected etc.”</i> - pp. 219</p> <p>Controversy is an unsuccessful translation.</p> <p>Callon, 1986 (pp. 219 – 221)</p>	
Allies	<p>Are effective spokespersons. A group of human or non-human entity which interacts with the innovation in a supportive way.</p> <p>A human or non-human entity which adds weight, power or force to an innovation. An ally acts as expected, it stabilizes network. An ally links in something that is identified as being desirable, such as another group of actors.</p> <p>A group of entities who share the same cause. A group of entities making their interests known.</p> <p>Akrich et al., 2002 (pp. 215 – 219)</p>	<p>For program implementation an ally is either a person or an object that behaves in a manner which increases the programs penetration, level of acceptance or adoption in a setting. It can be a person who thinks the program is essential to the setting and talks about the program in this way. An ally can also be a non-human entity such as a mandate, whereby the mandate of the organization can be referred to as a means of supporting or legitimating the presence of the program in that setting.</p>
Negotiation	<p>The tactics used by an entity to select potential alliances in order to limit compromise or alternatively, to make as many compromises as possible.</p> <p>A strategy to widen the margin for manoeuvre to enrol alliances and control their behaviour.</p> <p>Latour, 1987 (pp. 114 - 119)</p> <p>Is an interaction of influences. Such interactions include the process of resolving disputes, agreeing upon courses of action, bargaining for advantage, or crafting outcomes to satisfy various interests.</p> <p>Callon, 1986 (pp. 203 – 211)</p>	<p>The process by which a practitioner actively creates a favourable context for an appropriate adaptation of the program.</p> <p>Implies that adjustments can be made in either the human or non-human entities.</p> <p>Refers to compromises in the operation of the program, or effective arguments which can be made to engage support or participation from other entities.</p>
Socio-technical analysis	<p>Aims to follow the innovations characteristics which become transformed into as many properties as necessary.</p>	<p>For program implementation this refers to the analytic detail characterising the human and non-human entities. In reference to describing these properties or characteristics to a level which is necessary, we understand that a socio-technical analysis provides the same level of description as that which is provided by the informant.</p>

	<p>An analysis of the building on an innovation through choices which are made and pays particular attention at how, through these choices, potential allies are either cut off or become linked together.</p> <p>Combines two categories which we are prone to separating: the technical analysis which limits itself to a description of the objects per se and their intrinsic qualities; the sociological analysis of the object i.e. the environments within which it spreads and effects. This analysis combines these two analyses into one.</p> <p>Akrich et al., 2002 (pp. 204)</p>	<p>For program implementation this refers the analyst or evaluator to the decisions which are taken by the practitioners and how through these decisions the practitioner is forming the program.</p>
Obligatory Passage Point	<p>When a black box is used as an ally to stabilize a network it becomes an obligatory passage point to interest another potential ally. The black box services as a tool through which other entities interests become translated. By serving as an OPP, the black box is identified by other potential allies as necessary for them to achieve their goals.</p> <p>Latour, 1987 (pp. 132 – 144) Callon, 1986 (pp. 203 – 211)</p>	<p>For program implementation this refers the fact that actors from a setting can be convinced that the program is in fact important for them, as it will help them to achieve their own objectives. It refers to the strategies by which a program may become sustainable in a setting.</p>
Black box	<p>A black box is a system of alliances comprised of a sociogram and a technogram. The connections between the sociogram and technogram are stable. Translations and the selection of alliances have successfully made connections durable and resistant to competing translations.</p> <p>Latour, 1987 (pp. 132 – 144)</p>	<p>For program implementation this refers to an entity which is stable and acts in a predictable way. This entity will operate according to the goals of a program in a way which was anticipated.</p>
Mediator	<p><i>“A mediator, no matter how apparently simple (it) may look, it may become complex; it may lead in multiple directions which will modify all the contradictor accounts attributed to its role”</i></p> <p>- pp. 39</p>	<p>For program implementation this refers to entities which are complicated and whose behaviour with respect to the goals of the program cannot be anticipated nor controlled.</p>

	<p>A mediator does not behave in a predictable way. Mediators transform, translate, distort, and modify the meaning or the elements they are supposed to carry. A mediator is a sheer translator.</p> <p>Latour, 2005 (pp. 37 – 42)</p>	
<b>Intermediary</b>	<p><i>“Is what transports meaning or force without transformation: defining its inputs is enough to define its outputs”</i> - pg. 39</p> <p>It is essentially a black box, whereby even if it is composed of many entities, they all behave in such a consolidated way as to render the black box as a single entity.</p> <p>Latour, 2005 (pp. 37 – 42)</p>	<p>For program implementation this refers to an entity which is stable and acts in a predictable way. This entity will operate according to the goals of a program in a way which was anticipated.</p>

## METHODOLOGY

## 1 Research Design and Study Aims

The aim of this study is to explore program implementation through a theoretical lens that is alternative to those currently dominating health promotion program evaluation. This aim will be achieved through an *instrumental case study* (Stake, 1994) that explores program implementation as a socio-technical networking process. According to Stake (1994) a study of this nature examines a particular case to provide insight into an issue or refinement of theory, where the case “plays a supportive role, facilitating our understanding of something else” (p. 237). The school-based nutrition program “*Petits cuistots-Parents en reseaux*” (PC-PR) provides the case for this study into the social processes which describe how programs become implemented into a setting and why programs may transform over time and across settings. In accordance with the case study research design described by Yin (2003) this study poses one over-riding research question with several specific study propositions. The over-riding research question asks how PC-PR transformed over time and between settings, and why such transformations occurred. Three empirical propositions follow from this question. The first posits that the emergence of the nutrition intervention will be characterized by many transformations in the over-riding goals of the program (as well as among the people and things associated with it), whereby transformations reflect a need to remain or become a recognized solution to a community/school problem. The second and third propositions suggest that even as program goals become less dispersed, program transformations are still occurring in terms of how the program becomes represented and operates in relation to the conditions across the various schools. More specifically, according to the second empirical proposition, program practitioners will represent the program activities as being an indispensable response to the needs within a particular school. Finally, the third empirical proposition posits that nutritionists will differentially represent school contexts and that the operation of program activities will occur in relation to this representation. Thus, as the represented needs differ between schools, so too will the nutritionists representations and operation of program activities.



This study is an *instrumental case study* (Stake, 1994) and thus the empirical propositions have each been developed according to a theoretical framework. Namely the empirical propositions for this case study of a nutrition intervention correspond to formulations from the Actor-Network Theory (ANT) where data collection and analysis follow from its methodological approach to ‘follow the actor’ (Callon, 1986a, 1986b; Latour, 1999). The underlying premise of this theory is that actors know what they are doing and as investigators we have to learn from their actions without imposing our ‘expert’ presumptions and thus avoid limiting explanations of actions according to orthodox explanations. This empirical analysis thus ‘follows’ the interactions between human and non-human entities in order to divulge the social process which describe how programs become implemented into settings.

Each of the three empirical propositions given above were formulated according to theoretical propositions advanced by ANT. The first of three theoretical propositions, is that between 1989 and 2001 the program is characterized as an emerging socio-technical network where its successive translations reveal the movement in the program due to the inter-dependence of the human and non-human entities (i.e. socio-gram and techno-gram) (paper number one in the results section). The second theoretical proposition is that even as the socio-technical network becomes more consolidated, the focal actor group remains actively involved in building new connections and stabilizing existing ones by making compromises and negotiating the use and utility of non-human actors. The final theoretical proposition is that the work of building connections is a continuous negotiation and re-assessment of entities whose behavior as mediators or intermediaries is often uncertain.

## 2 Ethical review

Ethical approval was obtained from the Université de Montréal “Comité d’éthique de la recherche de la faculté de médecine” (CERFM 59(04) 4#139) in addition to “Alliance des professeures et professeurs de Montréal”, the “Commission scolaire de Montréal” (CSDM), and the “Comité central des parents de la CSDM”. All consenting

letters can be found in Appendix C. Approval was also sought and obtained from the educational regional directors (i.e. “*directions des regroupements*”) responsible for each of the two geographical areas where the participating schools were located, as well as the direction and the teachers from the grades five and six classrooms of the seven participating schools. Teachers and nutritionists gave their consent for observations and audio recordings of the nutrition workshops. Teachers and nutritionists further gave their consent for interviews: however, teacher interviews are not included as these interviews did not respond to the research questions of this thesis which focused upon the representations and operations of the program from the point of view of the primary actor group (i.e. nutritionists). Consent forms are found in Appendix C.

### 3 Data Collection

Three sets of data collection were completed according to each of the three empirical propositions. The first set of data was derived from two key informant interviews and three historical documents with the objective of describing the evolution of the program. Key informants included the individual credited for founding the program in 1989 – a mother, school volunteer and active member in the local community. The second key informant was the first dietitian to be hired for classroom ‘brown-bag’ lunch instruction around 1996 and was also the program director from 1998 to 2007. Historical documents included an independent research report on the early formulation of the program as a grass-roots community organization and two early promotional materials describing the program’s aims and activities. The next set of data collection involved semi-structured interviews completed with the program practitioners (i.e., nutritionists) in the spring of 2005. Interviews were completed to build an overall collective representation of the program and implementation theories and also to describe the strategies used by the nutritionists to adapt and stabilize the program across the various school conditions. The interview guide can be found in Appendix D. The third data set consisted of observations and audio-recordings of the actual delivery of the program during the nutrition workshops. Observation accompanied note taking which systematically described the facilities, layout of the classroom, placement of apparatus,

the number of students, the use of time and the overall behavior of students. Additionally, the interactions among the actors present in the workshop were also noted in a general sense. For example, the respective behaviors of the teacher and the parent(s) were recorded according to their involvement during the workshop in terms of assisting, controlling or contributing to the form of information, use of apparatus or engagement of students. The nutritionists' behavior was similarly recorded in terms of their general instructive style and organization, control or flexibility. A field log also kept a record of the observer's general impressions of the operation of the workshop and the particularities in the school.

In addition to these formal data, the researcher spent approximately 100 half days of participant observation with the host community organization *Les ateliers cinq épices*. During a period of one year she used a desk in the organization's office and participated in the monthly meetings of program staff and had informal discussions about the planning, implementation and evaluation of the workshops. As the only evaluator collecting field data, expectations as to the form an evaluation would take and what it may reveal were shared. During this time she maintained a field log in which she noted the various expectations that nutritionists entertained regarding her activities in the school. Discussions of this nature between the evaluator and the interventionists and program direction, resulted in the creation of a tool to evaluate the effects of the program on student's knowledge, attitude and capacity. During the creation of this tool, some of the differences between the nutritionists' operation and expectations for the program became key issues of discussion. Also, during observations of the nutrition workshops themselves, the evaluator was present in the classroom where the activity took place, both prior to and following the completion of the workshop, to set up and clean up. Informal conversations were also collected into a field log which noted how nutritionists perceived their role in the school, their actual and planned adaptations and impressions of how the workshop activity unfolded (i.e., satisfaction with the performance of students, teachers, and herself).

#### 4 Sampling

A total of eight schools located in two disadvantaged Montreal neighborhoods participated in the PC-PR nutrition intervention during the year of this study (2004/2005). Six out of the eight schools are located in the southwest and two are located in the northern part of the island of Montreal. All schools are part of the Montreal school board and serve the most (i.e. top 20%) disadvantaged primary school aged children living in Montreal (Anonymous, 2007). In addition, schools located in the north are characterized by a high proportion (about two thirds) of students whose mother tongue is not French. Schools in the southwest were recruited based upon their involvement with a community-initiated program serving lunchtime meals. Schools in the north were recruited through the active recruitment of the host community organization *Les ateliers cinq épices*. During the 2004/05 school year the program was implemented in kindergarten through grade five classrooms, involving a total of 113 classrooms and 2156 students. The number of students participating in the program per school ranged from 126 to 435 and the number of classes per school ranged from 12 to 22.

Interviews were completed between March and April, 2005 with six of seven nutritionists who were, at the time of the study, full time employees with *Les ateliers cinq épices*, the community organization responsible for the creation, financing and dissemination of the program into schools. One interview could not be completed due to sudden and unexpected budget cuts in the community organization, whereby a recently-hired nutritionist was let go before data could be collected. At the time of the interviews, two nutritionists had been employed by the program since its inception in 2000/2001, for three to four years, and one nutritionist had been employed for just one year. Two of the six nutritionists implemented nutrition workshops in two schools, whereas the others were assigned to one school each. The semi-directive standard interview queried the nutritionists' interpretation of the underlying premises of the program, and their interactions with school personnel, students, parents and other school interventionists regarding if and how these interactions influenced their actions, and

their expectations with respect to program operations and potential outcomes. The interview guide can be found in Appendix D. Each interview lasted from between sixty and ninety minutes. Interviews were recorded and transcribed verbatim.

Observational data were collected from grades four and five classrooms across seven of the eight participating schools. One of the eight participating schools did not serve students in grades four or five and was therefore not included in this study. The program was originally implemented at the kindergarten level and followed that cohort over the years while adding each subsequent kindergarten class. This meant that the grades four and five classes were involved in the program since kindergarten, whereas their teachers were likely to be in their first or second year with the program. Observations were limited to the grades four and five classes based upon the more advanced level of operational detail and variation which had been presumably introduced among these higher grades. Namely, due to the maturity and experience of older students, and a presumably higher level of interest among teachers to use the workshop for curricular demands, nutritionists were more likely to experiment with new practices and introduce new functioning with grade four and five classes. Mixed classes such as cycle two (combining grades three and four) and cycle three (combining grades five and six) were not included as younger students and those who had not participated in the program the previous year may have changed the dynamic among students and consequently the practices of the nutritionist. Observations and audio-recordings were completed for each of the nineteen classes which met the study's criteria. All teachers were asked for and gave their consent. The intention was to include in the observations the final four workshops of the year (i.e. a total of seventy-six workshops), however due to budget cuts the final workshop was eliminated. Based upon this constraint as well as others (i.e., workshop occurring at the same time, in different locations), a total of thirty-one workshop observations with audio recordings (n=31) were completed. Observational notes recorded the facilities and general layout of the workshops (i.e., placement of food items, utensils, tables and chairs) and the general behavior of the students, teachers and participating parents. Observational notes also included informal comments from the nutritionist regarding her intentions or impressions during workshop

set-up and clean-up. Audio-recordings were obtained through a dictation device worn by the nutritionist during the entire duration of the workshop. Dictations were not transcribed but rather were analyzed by an analyst who listened to the recordings, took notes and organized the findings from these notes into an analytic grid. The structure of the analytic grid was built from the results of study two. The descriptive detail of this structure was informed by this note taking process and from the observation notes.

## 5 Data analysis

Data analysis followed from an overall conceptualization of a program as an innovation where the innovation itself was conceptualized as a socio-technical network. The data analysis led to the selection and operationalization of concepts that described and explained program implementation as a socio-technical network. Three separate ANT-informed analyses were performed using the data collected from the PC-PR program. The first analysis traced the overall inter-dependence and dynamic of the program's socio-technical network over time by following the changes in its socio-gram and technogram. The second analysis focused more closely on the micro-processes of the program's socio-technical network to describe program implementation in terms of connections between the human (i.e. social) and non-human (i.e. technical) entities. Finally, the third analysis further described these connections as they were operated across the various school settings (i.e. *in situ*).

### 5.1 First data analysis

The first analysis constructed a story of the PC-PR over a thirteen year period (i.e. from its conception in 1989 to 2002) with the objective of identifying and explaining the various iterations (i.e. movements or shifts) in the program's form over time. This analysis was the subject of the first paper for this thesis. This study has been published in *Health Education Research Theory & Practice* and is entitled "Expanding our conceptualization of program implementation: Lessons from the genealogy of a school-based nutrition program" (Bisset & Potvin, 2007). Analysis of key informant

interviews and historical documents were guided by two concepts: the socio-gram and the techno-gram. The socio-gram depicted social actors whose interests aligned with a particular innovation. The techno-gram depicted the material objects, services or procedures (e.g. knowledge, know-how) which become 'activated' (or 'enrolled' according to ANT terminology) in order to resolve a problem.

Analysis began with the historical documents in order to build the program's timeline. Here, the major events in the program's history were recorded in chronological order. Major events were considered to be the appearance or disappearance of a techno-gram (e.g. collective kitchen, continuing education, food service) or a socio-gram (i.e. a community organization, nutritionists, mothers, or governmental agency financial support). From this juxtaposition of the social and the technical movements over time, the analyst asked 'how' and 'why' questions regarding their interplay. Questions included, for example, whose problem(s) did the techno-gram aim to resolve, how did the formulation of a particular problem differ between groups of actors, how did a techno-gram emerge or change form in consequence to the appearance of a new group of actors, or what can be understood about the actors (e.g. pre-occupations, professionalism) by the observed shifts in the techno-gram? Responses to questions regarding the motivations and consequences of changes in the techno-gram were cross referenced and validated against the key informant interviews and historical documents.

## 5.2 Second data analysis

Next, nutritionist interviews were analyzed in order to identify the micro-processes of the program's socio-technical network in terms of connections between the human (i.e. social) and non-human (i.e. technical) entities. This analysis was the subject of the second paper of the thesis. This paper is entitled "Exploring the intervention-context interface : A case from a school-based nutrition intervention". This paper is in preparation to be submitted to the American Journal of Evaluation. The analytic approach in that article followed from the general approach of the first analysis in that it

aimed to describe the innovation in terms of an ongoing interplay between the socio-gram and techno-gram components. This analysis however, provided a richer description of this interplay by describing the connections which hold together the socio-gram and techno-gram components. At the time of the interviews, nutritionists were active in the formation of connections, which, according to ANT, legitimated the existence of a network. That is, the greater the number of stable connections which characterized a network, the more it is recognized to have a utility for other human and non-human entities. It was thus expected that because nutritionists were preoccupied with making the nutrition program an essential solution to a health issue among children, they would reveal these connections in their experiences and expectations related to implementation of the program.

The analytic approach taken to identify and describe the connections which form the PC-PR program was inspired by an empirical work applying some of the methodological principles from ANT (Callon, 1986b). This work describes the social processes through which a focal actor group (i.e. *primum movens*) builds a network of alliances in order to advance their own interests. According to this empirical work, the *primum movens* forms a network with an 'inter-definition' of a group of social actors and non-human entities who are in one way or another, connected or concerned with the problem at hand. The human and non-human entities in the network are 'inter-defined' by the focal actor group to highlight their inter-dependence toward the resolution of a problematic situation (i.e. *problematization*). Although the problem is principally defined according to the pre-occupation a focal actor group (i.e. *primum movens*), this definition is 'negotiated' in order to capture and maintain the 'interests' of these human and non-human entities. The act of 'negotiating' is referred to as a 'double-movement' because the focal actor group reframes the problem such that its resolution brings them together with these humans and non-humans in that they become dependent upon one another. This movement of setting up a strategic resolution in a way which creates a connection between two previously disconnected entities is referred to as *interessement*. The strength of the network relies on the focal actor's ability to comprehensively and accurately describe and identify the interests of the entities with whom they aim to



connect into a network. However, this ability is inevitably fallible due to the complex and uncertain nature of the actor-network whereby entities behave like mediators more often than as intermediaries.

Although Callon's (1986) empirical work goes further in the illustration of strategies taken toward the establishment of successful (*enrolment* and *mobilization*) and unsuccessful (*controversy*) alliances, the analysis undertaken for this case study has focused upon the nutritionists' attempts to define their interests in relation to other actors and entities, and the strategies taken in order to interest and enrol human and non-human entities (i.e. build connections in the form of a socio-technical network). Definitions of the ANT terms used for this study, their reference to program implementation and empirical examples can be found in Table Two, found at the conclusion of this section (i.e. 2.5.2 Second data analysis).

Identifying connections and describing their formation from the nutritionists' interview data was achieved through both a deductive and inductive approach to coding and categorization. First, the data were coded deductively according to the presence of concepts in the nutritionists' discourse which corresponded to a relatively precise terminology described by Callon (1986) in his empirical application ANT. Namely, the interviews were coded deductively for *problematization* and *interessement*. However, since *problematization* captures two distinct features of the entity, it was coded according to Identity and Goal codes. Identity codes tagged places in the data which described an entity in terms of who, or what, the entity was (i.e. role, qualities, qualifications, capacities, expertise, identity). Goal codes tagged places in the data that described what the entity wanted (i.e. pre-occupation, goal, interests). Again in reference to ANT, it is by this *problematization* that the focal actor group defines its own identity and goals (i.e. of whom the group is comprised and what the group wants) and in so doing, situates itself as essential for the *problematized* actors to overcome their limitations in order to get what they want (i.e. reach their goals). Interviews were thus also coded for the definitions the nutritionists gave of themselves and their own goals and preoccupations. Please refer to Appendix E for an example of the 'moments of

translation' coding scheme as it was used to code data in reference to Teachers from one of the Nutritionist's interviews.

Coding began by finding places in the transcribed text from the interviews where the nutritionist *problematized* a group of entities (including a group to which the nutritionist belonged) or a single entity (including herself). A code was tagged to this segment of data. The name given to the code identified this segment of data according to four characteristics: 1) whether the entity described was a human or non-human entity (appearing in the code as "SOCIO" or "TECHNO"); 2) the name given to the entity (e.g. Teacher, Student, Nutritionist, Table, Recipe, Lesson); 3) reference to a goal or an identity (appearing in the code as "Goal" or "Identity"); 4) a descriptive statement. These Goal codes and Identity codes captured what ANT would describe as *problematization* whereby the nutritionists identified a group of entities with whom she wished to build connections, and defined these entities in terms of how they need the program to reach their goals. As shown in Table Two, while students were identified in terms of their health status and disease risk, in ANT terminology they were further *problematized* in terms of how the program could provide them with what they actually want, namely to be recognized for accomplishments, demonstrate knowledge and know-how, participate in privileged activities and be 'in the know' with current up to date information.

Following the same procedure as the coding scheme for *problematization*, the interviews were also coded deductively for the concept *interessement*. In ANT terminology an act of *interessement* is defined as 'negotiation' and refers to any action which reduces an obstacle or increases an opportunity for an entity to become connected or maintain their connection with the program. In the analysis of program implementation, acts of *interessement* were defined as either compromises which may have been less favourable in the short term (but possibly advantageous in the long run), or as negotiation where a program component becomes modified or placed into a new situation. The coded segments of data where the nutritionist described herself as employing a concrete action whereby she compromised or modified some component of

the workshop activity were coded as *interessement*. The name given to the code identified this data according to four characteristics: 1) whether the entity with whom the nutritionist negotiated was a human or non-human entity (appearing in the code as “SOCIO” or “TECHNO”); 2) the name given to the entity the nutritionist was ‘interesting’ (e.g. Teacher, Student, Nutritionist, Recipe, Classroom, Food); 3) an act of *interessement* (appearing in the code as “Interessement”); 4) a descriptive statement.

As shown in Table Two, nutritionists put class work on display (thus demonstrating which classes had, and which classes had not, completed the preparatory activity) and circulated exemplary practices (i.e. telling teachers how others had used the program materials in novel ways). These strategies were described as a means to motivate teachers to ‘keep-up’ with their co-workers, and in so doing, appealed to a sense of competition among the teachers (i.e. teachers were identified as being in competition with one another). Another example found the nutritionists altering the use of the recipe by using it to teach the class about math or as a method to practice collaboration work methods. These strategies were described as means to interest teachers in the workshop as ‘time saving devices’ through the use of which they could accomplish several of their curricular requirements (i.e. teachers were identified as being overburdened and lacking time).

According to ANT, the connection with a specific entity is being ‘worked out’ or negotiated when this entity is perceived as having a relevant role toward the achievement of a particular goal. Thus, all of the entities identified by the nutritionists could be considered in the analysis. A non-human entity could be something tangible such as food or a cooking utensil, or it could be intangible, such as knowledge or an ability. It could also lie somewhere in between, as something which is used to organize human activity (i.e. meetings, a lesson plan, a work method, timetable). Coding followed two strategies in order to avoid coding for each and every *thing* (i.e. non-human entity) referred to in the data. First, coding began with a focus upon the human entities and next the data was coded for non-human entities which were identified as posing a problem, having or causing an unexpected effect. However, during analysis of

the *interessement* strategies, non-human entities were found to be playing an important role in mediating the negotiating process between nutritionists and other human entities. Thus, non-human entities were considered in the analytic process for their role as *interessement* devices. Please see Appendix F for some examples of memos describing how non-human entities were identified as *interessement* devices. This approach is consistent with propositions of ANT where negotiations with entities which “pass” between actors in the course of a relatively stable transaction” (Callon, 1986a, p.25). Thus, non-human entities have the potential to allow the connections in the socio-technical network to stabilize. The non-human entities described in the data as posing a problem, having or causing an unexpected effect were then revisited in order to determine if and how these interpretations may have contributed to or against the formation of a stable connection.

Once the data was deductively coded for *problematization* and *interessement*, inductive analysis grouped the descriptive codes (found after the “Identity”, “Goals” and “*Interessement*” headings) into categories for each of the human entities. This grouping proceeded in two steps. First, the codes were organized according to *problematization* and *interessement* for each of the human-entities. For example, all the *problematization* codes that referred to Teachers (i.e. “Identity” and “Goals”) were grouped together that referred to Teachers. Next, based upon the descriptive part of this code, codes were compared and contrasted for grouping into higher order categories. For example, text referring to Teachers “Identity” included descriptive codes such as *lacking opportunities to evaluate social competencies*, *lacking health education expertise*, *lacking time* and as *overburdened*. Together, these descriptive codes created a sub-category under the Teacher Identity category called *Being Challenged to Complete the Educational Program*. Alternatively, text referring to Students’ “Goals” included descriptive codes such as *wanting to participate in privileged activities*, *wanting to be ‘in the know’* and *wanting to obtain usable information*. Together, these descriptive codes created a sub-category under the Student Goals category called *Wanting to Play a Larger Role at Home*.

The inductive procedure permitted a thorough description of the ways nutritionists *problematized* themselves along with other human entities in the school. Organizing these categories and their descriptive dimensions separately for each of the nutritionists also revealed the similarities and differences among the nutritionists. For example, some nutritionists described teachers as pre-occupied uniquely with the delivery of their core curriculum and the evaluation of new curriculum, whereas other nutritionists described teachers as having pre-occupations that included health education. Further, while all nutritionists identified teachers as lacking resources and being part of a larger network that values pedagogic expertise and professionalism, only some nutritionists identified teachers as role models and having personal interests in nutrition. From these results narratives were written for each of the actors who were *problematized* by the nutritionists, and highlighted commonalities and differences between nutritionists (please see Appendix G for an example of narratives and *problematization* codes for nutritionists and students). These narratives were used to build a description of the nutritionists' collective *problematization* of the actors with whom they aimed to build a socio-technical network and as well, to describe areas of contrast between nutritionists.

A similar inductive procedure was also pursued for the *interessement* codes that grouped similar types of *interessement* strategies together and attributed these groupings descriptive labels. Data were then analyzed for the relationships between the *problematization* codes and the *interessement* codes. These relationships were identified through two strategies. First, the non-human entities that were coded as posing a problem or having or causing an unexpected effect, were considered in a role as an *interessement* device between the goals of the nutritionist and the goals of another human entity. Second, during the drafting of the *problematization* narratives, the analyst referred to the *interessement* codes and wrote memos hypothesizing about the relationship between these *interessement* codes and the *problematization* narratives, and then verified through the data, the presence of these strategies to resolve the issue (please see Appendix H for an example of a tables illustrating strategies aimed at linking nutritionists' goals with those of teachers, students and parents).

This reflexive process advanced through the completion of tables, writing of narratives and memos, organization of the nutritionists' strategic actions to align her interests with those of the other groups of actors, and by verifying these associations back against the raw interview data. By beginning with the overarching goals which were common among all nutritionists, the *problematizations* and the *interessement* strategies which followed were sufficiently abstract that they could capture a broad representation of the socio-technical network shared among all nutritionists.

Table Two. Actor-Network Theory (ANT) terminology applied to data analysis in a case study of health promotion program implementation

ANT Term	Definition of ANT term as found in various literatures	Application of the ANT term as applied to program implementation	Empirical demonstration of concept from case study
Problematization	The moment of translation during which the <i>primum movens</i> inter-defines a selected range of entities. Inter-definitions define the identity in a manner consistent with the interests of the <i>primum movens</i> , establishing itself as an obligatory passage point (OPP) thus "rendering itself indispensable"  Callon, 1986 (pp. 203 – 211)	For program implementation, this refers to the implicit strategic nature of the practice of program implementation. It directs analytic attention to the manner in which practitioners are identifying and defining people and things in terms of how the program can be of interest to them.	<b>SOCIO:Student:Goal:</b> - be recognized for accomplishments - demonstrate knowledge and know-how - participate in privileged activities - be 'in the know'  <b>SOCIO:Student:Identity:</b> - high risk for obesity - exposed to high risk environment - often receives negative feedback from school - experiences disconnect between home and school
Interessement	The moment of translation which involves a process of convincing others through strategic acts, to accept the definition they were attributed by the focal actor.  Callon, 1986 (pp. 203 – 214)	For program implementation this refers to actions taken by the program practitioner in order to maintain the interest of an existing entity or to gain the interest of a new entity in the program.	<b>SOCIO:Teachers:Interessement:</b> - displaying class work - circulating exemplary teacher practices among teachers and between schools  <b>SOCIO:Teachers:Interessement:</b> - using recipe to teach fractions - using recipe as a collaboration method

### 5.3 Third data analysis

The third and final data analysis aimed to identify the relationship between the specific conditions in the school and the negotiations nutritionists employed in order to operate the program. Similar to the second study, this third study details the micro-

processes by which the nutritionists built connections to stabilize a socio-technical network in the school. The objective of this study was to describe the formation of these connections in relation to the specific conditions across the schools. This third study was based upon an analysis of the nutritionist interviews for variation in *interessement* strategies together with observations of the nutrition workshops and the creation of an analytic grid. This paper is entitled “The strategic nature of health promotion practice: An exemplary of the interventionists mediating role during program implementation”. This paper is in preparation to be submitted to Health Promotion Practice.

Data analysis for this third article built upon the results of the second data analysis. Results from the second data analysis identified the overriding connections nutritionists were building with the students and the school. These results also suggested that nutritionists differed with respect to which connections they privileged and how *interessement* strategies were employed to build them. This analysis continues this study of the connections (or alliances) with a detailed attention to the conditions in the school which influenced their establishment. That is, this study aimed to identify how the nutritionists differentially operated the program’s techno-gram according to the conditions in the school.

Analysis of the workshops was specific to each school and began with the observation notes to describe the general composition the workshops in terms of people (i.e. class size, presence of teachers, parents), the overall functioning (i.e. total duration, sequence and duration of the workshop components) and the layout or set-up of the workshop (i.e. characteristics of room, number of tables, placement of food and cooking utensils). A more detailed analysis then followed based upon the workshop audio recordings. Since the workshop was composed of several components, the analysis of the workshop audio-recordings advanced one component at a time, and these components were compared and contrasted between the nutritionists. For example, all nutritionists consistently provided instructions prior to beginning the food preparation activity, thus, this instructional component of the workshop was compared among the nutritionists.

A series of templates describing the practices as they corresponded to each of the *interessement* strategies to build alliances with students and teachers, specific for each of the workgroup components, was built incrementally by analyzing notes taken while listening to the audio recordings and comparing these notes to the over-arching *interessement* strategies. Notes were fairly unstructured and aimed to describe how nutritionists instructed and involved students, referred to the workshop tools and food items, and addressed other adults who were present. This procedure revealed variations in practice among nutritionists. For example, descriptive details of food may or may not have included an experiential component such as taste, smell or feel, and a working procedure may have offered students different degrees of opportunity to involve themselves in the completion of a recipe or the formation of knowledge.

The template consisted of a comprehensive list of all practices across all nutritionists where descriptions become revised or new actions were added as they occurred. Examples of the final template or 'master lists' for three workshop components: the food preparation, demo/instructive component prior to the food preparation and the theory or formal lesson can be found in Appendix I. Upon the completion of this template workshops were listened to anew and practices associated with each of the workshop components across all schools (i.e. A through F-ii) were copied into the *analytic grid*. The analytic grid can be found in Appendix J.

Each nutritionist was assigned to one school, so her practices during the workshop relate uniquely to the conditions of one school. For example, nutritionist 'A' implemented the program only in school 'A', nutritionist 'B', uniquely in school 'B', and so on. The only exception was with nutritionist 'F' who implemented the program among grades 4 and 5 in two schools. To distinguish the practices as they occurred within these different schools, this nutritionist is referred to as nutritionist 'F-i' and 'F-ii', where 'i' and 'ii' refer to two different schools.



The analytic grid features three dimensions. First, it contains the over arching strategies identified from the second analysis whereby nutritionists built connections with students and the school (y-axis, labeled in first column of grid). Second, it features the various components of the workshop (x-axis, labeled in the fifth column of the grid). The third dimension refers to the nutritionists' practices as they occurred within a particular school during the nutrition workshop. Where a practice occurred during one workshop but not another (i.e., with one teacher or class, but not another) the descriptive activity was preceded with "var" to indicate that this practice was variable. Where a practice occurred consistently during all of the observed workshops, the descriptive activity was preceded with "con". Once the analytic grid was completed, the number of constant and variable practices for each strategy was counted to compare the emphasis nutritionists placed on the different *interessement* strategies.

Comparisons across nutritionists were informed by the *interessement* strategies and aimed at identifying and describing each nutritionist' practices in terms of the operation of these strategies during the workshop in relation to the conditions of the school. The analytic grid thus describes the practices as identified through analysis of the workshop audio-recordings according to each of the strategic actions which were used to build alliances with students, as well as those strategies used to build alliances with teachers. The audio recordings were analyzed for the ways in which nutritionists operated the techno-gram entities and the role attributed to the actors in this operation.

In summary, the purpose of this grid was: 1) to identify nutritionists' practices as they occurred in a particular school during the operation of the nutrition workshop; 2) to relate these practices to an overarching strategy as previously identified from the second data analysis; 3) to determine if and how nutritionists variously implemented strategies which privileged the formation of some connections over others and; 4) to relate this variation to the conditions in the school.

## 6 Research Quality Criteria

The value of research findings is often based upon the capacity of the researcher to demonstrate that the presented results were not driven by the researchers own subjectivity, were not confounded by unaccounted context or due to a unique characteristic of the sample (Laperrière, 1997). In this sense, the study design, data collection and analytic procedures aim to reduce the effects of human subjectivity and context on the research findings. Qualitative research however tends to be associated with an epistemological repositioning of these value judgments. Instead of being incorporated into study design, analytic and data collection procedures aim to reveal the role of subjectivity and context in relation to the study findings (Laperrière, 1997). Opinions vary on the role of criteria and the tolerance for subjectivity in qualitative research. At one end of the spectrum we find quality criteria that parallel quantitative and experimental research criteria and at the other, we find arguments against the appropriateness of criteria altogether (Steinke, 2004).

The study design, data collection and analytic procedures used for this case study aim to identify subjectivity and its relationship with context during program implementation. The theoretical principles of ANT orient analytic procedures to identify this interaction. In this respect, the research criteria used for this study are based upon a belief that the way we learn and what we learn about the social world passes through an activity of selection and interpretation linked to our values (Laperrère, 1997). The way we see objects is intimately connected to these values and therefore the objective and subjective cannot be dissociated. Therefore, our knowledge is inescapably connected to our participation in the world. It follows that the subjectivity of the researcher influenced the results of this study. At one level, interpretations of the data as they relate to the ANT framework are dependent upon the researcher's understanding of this framework. At another level, what was privileged in the observations and interpretations of the researcher, and the representations and practices of the study subjects and study documents, reflects her values and judgment of why and how specific

educational practices and a nutrition intervention in particular relate to childhood development and health.

This position does not however preclude the utility of quality criteria which can assist researchers in arguing the value and quality of the investigation and results (Guba and Lincoln, 1985), whereby others can judge the different decisions and constructions within the research process (Steinke, 2004). The basis upon which this study defends the quality of its finding rests, in part, upon the typology presented by Yin (2003) as it refers to the case study. The over-riding principle upon which research quality is judged within the case study is captured by Laperrière (1997) who identifies the articulation between the aims of the research, empirical data and theoretical orientations as building the rigor of the study. The typology presented by Yin (2003) identifies a set of tactics to be used during the creation of research design, data collection and data analysis to build construct validity, internal validity, external validity and reliability.

Construct validity refers to the development of a “sufficiently operational set of data” (pp. 35) where the significant, operational events have been specified *a priori* in order to avoid collecting data haphazardly based upon subjective judgments. This case study addressing the process of program implementation could have collected data from a variety of sources where implementation could be seen as having occurred at many program-context ‘interfaces’. For example, the study could have interviewed teachers on their use of program materials, students on the transfer of program material to the home or parents on their involvement with the workshop or program outings. However, the data collection followed from a theoretical premise that as the focal actor group, the program practitioners would act as ‘translators’. In this respect, it was appropriate for evidence of this theoretical proposition to be derived from the representations and practices of the program practitioners.

Other tactics identified by Yin (2003) to build construct validity include the use of multiple sources of evidence, establishment of a chain of evidence, and the need for key informants to review draft case study reports. Construct validity has also been

strengthened in this study through the use of multiple data sources (i.e., program documentation, interviews and observations) each of which provided a distinctive methodological approach to addressing how and why the nutrition intervention transformed over time and between settings. This triangulation procedure also offered the potential of leading the study to a deeper understanding of the issue under investigation (Flick, 2004). In this case study, the second method examined the general experience of the nutritionist about the conditions encountered and strategies used to implement the program, whereas the third method revealed how these ideas were operated.

Providing key informants with draft reports is a form of member checking (Miles & Huberman, 1994). Member checking is a validation procedure by which the analyst verifies their interpretations of the data against those of the participants. Unfortunately, due to sudden and unexpected budget cuts at *Les ateliers cinq épices*, all except two of the nutritionists interviewed left the organization prior to the commencement of formal data analysis. Furthermore additional demands were placed upon these two nutritionists to create new nutrition workshops for the following year and assist with the training of new nutritionists once additional funding was secured. Placing additional demands upon these nutritionists was judged to be inappropriate. However, the researcher's informal interpretations and the various representations of the program and its interactions with the school context were tested. Opportunity for such discussions occurred as a result of the creation of an evaluative survey tool (Bisset et al., 2008). The creation of this tool was a collaboration between the practitioners and the researcher, thus creating many opportunities to discuss the occurrence and rationale for program transformation among the practitioners.

The internal validity of case study results can be achieved through four tactics, including pattern matching, explanation-building, addressing rival explanations and the use of logic models. Pattern matching seeks to “compare an empirically-based pattern with a predicted one” (Yen, 2003; pp. 116). When patterns coincide, the internal validity of the case study is strengthened. Explanation-building is a form of pattern

building but on a much deeper level whereby explaining a phenomena stipulates presumed causal links about it. High quality case studies are those where explanations reflect a theoretical proposition. Logic models are defined as another form of pattern matching and explanation-building which is based upon a sequence of events which are anticipated to occur over time. For the purposes of this study, patterns are predicted on the basis of the Actor-Network Theory analytic approach but are not sequence based. Therefore, the tactics identified as appropriate for this case study include pattern matching, explanation-building and addressing rival explanations. Guided by the ANT conceptual framework the study design incorporates pattern matching and explanation-building into its analytic procedures. Internal validity is therefore strengthened by specifying *a priori* the theoretical propositions in terms of empirical expectations.

Beyond these case study tactics, several strategies to improve the research quality were also employed to build the internal validity of this study. Peer debriefing is a procedure by which impartial colleagues provide an external check on the inquiry process (Lincoln & Guba, 1985). This process was an ongoing part of this case study. For a period of approximately two years, a group of doctorate and post-doctorate students (i.e. Qualitative Research Discussion Group) met bi-monthly (i.e. every two months) to discuss the evolution of the analytic approaches which they were developing in relation to their qualitative research endeavors. While the members of this group were not familiar with the ANT framework they were each struggling with the challenges of operationalizing social theory concepts into their own empirical studies. Discussing this theory and its use in the case study allowed the methodological activities of this study to benefit from their feedback. In particular, this process contributed to the sense making of the methodological approaches and the coding procedures.

The analysis also incorporated procedures described as making constant comparisons and asking questions of the data (Strauss & Corbin, 1998). Constant comparisons was incorporated into the analytic procedures by inductively forming the descriptive codes into abstract categories, and describing these categories and properties by dimensions which varied according to different circumstances. This procedures

added to the quality of the research by “looking at something somewhat objectively rather than naming or classifying without a thorough examination of the object at the property and dimensional levels” (Strauss & Corbin, 1998; pp. 80). Field and reflexive notes supplement data collection and add rigor to this study by questioning the data and the patterns which emerge. During analysis, questions regarding the relationship between the identified entity and the informant, what the informant identified the entity as wanting or needing, and how they used non-human entities to respond to these needs, are samples of questions which were posed during the analysis of the informant interviews.

To some extent, rival explanations were also incorporated into data analysis. For example, according to ANT, a nutritionist who represented herself as encountering more resistance among the teachers vis-à-vis the use of the program timetable for the workshop activity, would either make compromises in the use of the program or negotiate with the teacher with the aim of demonstrating to the teacher, they, he or she would acquire gains through participation. Alternatively, nutritionists might have made changes in the program for reasons which did not relate to the school actors. Identifying and describing these rival explanations thus provided an opportunity for propositions to be revisited and perhaps reformulated to respond more precisely to the phenomena under study.

External validity in the case study distinguishes between statistical and analytic generalization, where the latter is a relevant part of the case study but the former is not. The results derived from this case study are not intended to be generalized to a larger universe of school-based nutrition interventions. As an instrumental case study, the research objective was to generate knowledge as to the suitability and utility of applying an ANT analytic approach to program implementation and perhaps to offer an interpretation of this theory for further research into health promotion program implementation. Thus generalization can only be gained through future research which applies the ANT framework to another case of health promotion program

implementation. It is only through replication that the support for the suitability and utility of an ANT analysis can be determined.

Reliability refers to the use and documentation of study procedures in a way that would enable another investigator to follow the same procedures and arrive at the same findings. Data analysis used a computer software to keep track of codes and ongoing memos, incorporated tables to classify and organize codes, produced narratives and tables to establish relationships between categories in a manner that could be audited. A process was also set up to ensure that interpretations of ANT by the investigator and the occurrence of ANT processes were accurate. That is, a validation procedure was established to test the interpretations of key concepts as coded in the data by investigator against an external coder. However, while the external coder ascertained that the collection of these codes into sub-categories made sense, the exact replication of the sub-categories created by the investigator was not a goal of this process. A qualifying check by an external coder with sound knowledge of the sociology of translation and the PC-PR nutrition intervention was provided in order to assure the framework guided data analysis in an accurate and consistent manner. However, as sub-categories provided more detailed descriptions of these over-riding ANT categories, the review simply ascertained the trustworthiness of the coding.

More precisely, the coding of one interview was reviewed in its entirety by an external reviewer and discussions between the analyst and the reviewer on the appropriateness of the codes were pursued. Discussions influenced the organization of the coding scheme and its consistency. Further, this process directed the analysis and coding procedure to focus upon one group of social actors at a time. The analyst also checked her understanding of the moments of translation and its practical application to the data during a qualitative research discussion group, which took place on a monthly basis.

Validation procedures did not revisit the analyst's interpretations of the workshop audio-recordings. These interpretations thus risk being driven by the

analysts' subjective impressions. However, two levels of data collection were used to ensure that the practices recorded on the analytic grid provided a reasonable resemblance to those practices which took place during the workshop. Namely, by being present during the workshop, taking detailed observation notes during and following the actual workshop, and revisiting and expanding upon those notes while listening to the audio-recordings, a subsequent investigator could test the reliability of the analytic grid.



## RESULTS

Results are found in the form of three articles;

The first study is;

Bisset, S., & Potvin, L. (2007) Expanding our conceptualization of program implementation: Lessons from the genealogy of a school-based nutrition program. *Health Education Research Theory & Practice*, 22(5), 737-746.

The second study is entitled; “Exploring the intervention-context interface : A case from a school-based nutrition intervention”. This paper is in preparation to be submitted to the American Journal of Evaluation.

The third study is entitled; “The strategic nature of health promotion practice : An exemplar of the interventionists mediating role during program implementation”. This paper is in preparation to be submitted to Health Promotion Practice.

### ARTICLE ONE

Bisset, S., & Potvin, L. (2007) Expanding our conceptualization of program implementation: Lessons from the genealogy of a school-based nutrition program. *Health Education Research Theory & Practice*, 22(5), 737-746.

# Expanding our conceptualization of program implementation: lessons from the genealogy of a school-based nutrition program

Sherri Bisset\* and Louise Potvin

## Abstract

This work presents a theoretical framework in which health promotion and health education program implementation can be conceived as an open dynamic system. By tracing the evolution of an elementary school-based nutrition program from its conception to its recent form, we construct a program genealogy. Data were derived from two interviews and three historical documents from which historical events were identified and reconstructed in the form of a tree analogy. Data analysis ensued using concepts from the actor-network theory about social innovation. These concepts identified social and technical program attributes and situated them within a process which evolved over time, thus permitting the program's genealogy to appear. The genealogy was found to be influenced by the ways in which the involved actors interpreted the issue of food security, namely, as a professional issue, with a nutrition education response and as a social issue, with a community-building response. The interaction between the interests of the actors and the technical components of the program resulted in three temporal program iterations. The results highlight the important role played by the involved

actors during program implementation and suggest the need to take these interests into consideration during all phases of program planning.

## Introduction

Programs have life cycles [1, 2] and history [3], with components which can be redirected as they evolve [4]. Recent work suggests that a program sustainability process essentially begins during its planning and implementation [5] and is dependent upon program modifications over time [6]. Program implementation literature, however, typically portrays programs as static entities which are more dependent upon decisions made during planning than what seems to happen in real life. In this sense, program implementation is judged against 'model program' standards for program delivery in order to determine its potential for effectiveness [7, 8]. Results from a wide range of health promotion programs implemented in the school setting suggest that programs are rarely implemented as planned [9–12]. In this regard, there is a need for 'a body of knowledge based upon practical experience of program delivery on the ground' [9] (p. 30) in order to advance understanding regarding the circumstances that enhance program implementation. The present work responds to this need by analyzing the evolution of a school-based nutrition program as a dynamic system, taking account of the program's technical features as they change in interaction with the interests of relevant actors.

Health promotion programs are commonly identified by their technical attributes, which include

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a statistical definition of the problem, a program theory represented by a logic model, products and services [13]. These relatively fixed attributes contrast with other parts of the program which are less stable, amenable to control, and predictable, namely the people behind program planning or implementation. While such social attributes are not typically considered within health promotion or education programs, they have been found to have important influences on the development and perceived value (and use) of community [14] and school-based [15] health promotion. Social attributes described as learning processes among the implicated actors have also been described as interrelated to changes in program design and activities over time [16]. Within the health service literature, the values, interests and power distributions of concerned actors are presented as being directly implicated in the adoption of innovations [17, 18], where innovations refer to entities such as new technology or a new idea, product or program [19].

We argue that the current literature on health promotion and education program planning and implementation has been overwhelmingly centered upon the technical program attributes. The social processes inherent to the intersectoral and collaborative partnerships called upon by the Ottawa Charter [20] are understudied and their impact on program planning and implementation still inadequately theorized [21]. Adopting the view that health promotion programs are ‘negotiated spaces’ resulting in a ‘constant evolution of program contours’ [14] (p. 1296), we further suggest that the implicated actors and their interests are essential components in the development of a program’s model and to understanding the features which contribute to a program’s success. A program genealogy would reveal those interests and negotiations that critically oriented program implementation. Diverging from the commonly held interpretation of genealogy as a map that uncovers an origin through sequential descent, genealogy is understood here in the Foucauldian sense where history is understood as sporadic and contingent, lacking the continuity and predictability often associated with ancestry [22].

Within the ‘social innovation process’, innovations are developed through a continual interplay between both social and technical processes [23, 24]. Taking conceptual guidance from the actor-network theory, the aim of this article is to construct the genealogy of a school nutrition program. This analysis will identify both the social and the technical attributes of the program and analyze how they interacted to change the form of the program from its conception up until 2002. In particular, we will demonstrate that program form is associated with the interests of social actors and that these interests change over time as a result of new opportunities and challenges.

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### The program

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The program *Petits cuistots–parents en réseaux* (Little Cooks–Parental Networks) (hereafter referred to as PC-PR) aims to build culinary abilities and nutritional knowledge among children and their families living in disadvantaged Montreal neighborhoods. The title of this program ‘Little Cooks–Parental Networks’ captures its two components. ‘Little Cooks’ is aimed at primary school children and is animated by nutritionists with the assistance of the classroom teacher and volunteer parents. This classroom component is composed of a series of interactive hands-on nutrition workshops introducing a range of nutritional, culinary, cultural and agricultural concepts, along with integrative exercises that teachers can use as illustrative material in regular curricular activities. The second program component ‘Parental Networks’ is run by community development workers and aims to support the development of mutual support networks through parents’ active involvement in the program. This component joins the first through invitations given to all parents to participate in the nutrition workshop and also to join their children in at least two annual events. The ultimate objective of the PC-PR initiative is to promote healthy behaviors and attitudes through an increased capacity to transform raw foods into nutritious meals and also to promote citizenship and a sense of social conscience among young school children and their families.

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## Methodology

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The objective of this paper is to construct the genealogy of PC-PR as a school nutrition program evolving from other nutrition-related community initiatives. The genealogy metaphor follows from the work of Foucault [22] who conceived of genealogy as a historical inquiry that does not attempt to establish linear continuity between events and that demonstrates the origin of things only in relation to and in contest with their socio-historical context. The social innovation process as modeled by the actor-network theory primarily developed by Callon [23, 24] provides the conceptual tools which were used to create the genealogy of the PC-PR program. From within this framework, the 'socio-gram' refers to all the actor networks which interact with each other and with the innovation. The grouping of actors into networks arises from the collective interest held by a group toward the innovation and anticipation of the innovation's response to a particular issue (i.e. the problematization). The 'problematization' thus refers to the manner in which the issue, as well as all actors' roles and identities are defined. Actions surrounding the advancement of innovations are described by the interests and values of a 'network of actors', along with the power differentials between them. The 'techno-gram' refers to the program's activities, services and resources, along with the theoretical or 'logical' framework or mechanisms. 'Controversy' refers to an obstacle or conflict which forces the network of actors to reorient or expand the problematization.

This analysis was developed through interviews with two individuals credited with the elaboration of the program, along with three program documents [25–27]. A parent who created a collective kitchen in the early 1990s, and who was at the origin of the program was first interviewed. This information was validated against a program document [25] and was used to construct a tree illustration of the program's evolution. A second interview was completed with the current program director. Using the tree illustration as a guide, the primary objective of this interview was to validate the tree

model, fill in incomplete information and expand upon details. These data were validated against two program documents [26, 27]. The genealogy was recirculated to three additional informants having a longstanding interest and/or involvement with the program (i.e. school board coordinator, community activist/worker). This process of exchange between interested actors and the paper's authors continued until the constructed genealogy was judged to accurately reflect the development of the program.

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## Results

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### The genealogy of PC-PR

The evolution of a school-based nutrition program from 1989 to 2003 has been illustrated with the use of a tree analogy (Fig. 1). While food security remained the key issue associated with the program, its characteristics varied according to the interests and underlying values associated with appropriate responses to the issue of food insecurity. Analysis of the program evolution revealed three distinct temporal program iterations that are clearly related to one another but correspond with transformations of the functional interplay between the socio- and techno-grams resulting from iterative problematizations and controversies.

### Program foundation: expanding program with community networks

The first iteration ranged from 1989 to 1993. In 1989, two distinct networks of actors came together to initiate a collective kitchen in a poor neighborhood of Montreal. The first network was composed of mothers volunteering at their children's school as lunchtime monitors. The second actor network consisted of nutritionists who were mandated through public health interests to initiate collective kitchens in disadvantaged Montreal communities. From a health professional perspective, the collective kitchen represented a solution to food security which valued actions to build family capacity to eat well-balanced meals at reduced costs. However, for the mothers, the collective kitchen corresponded

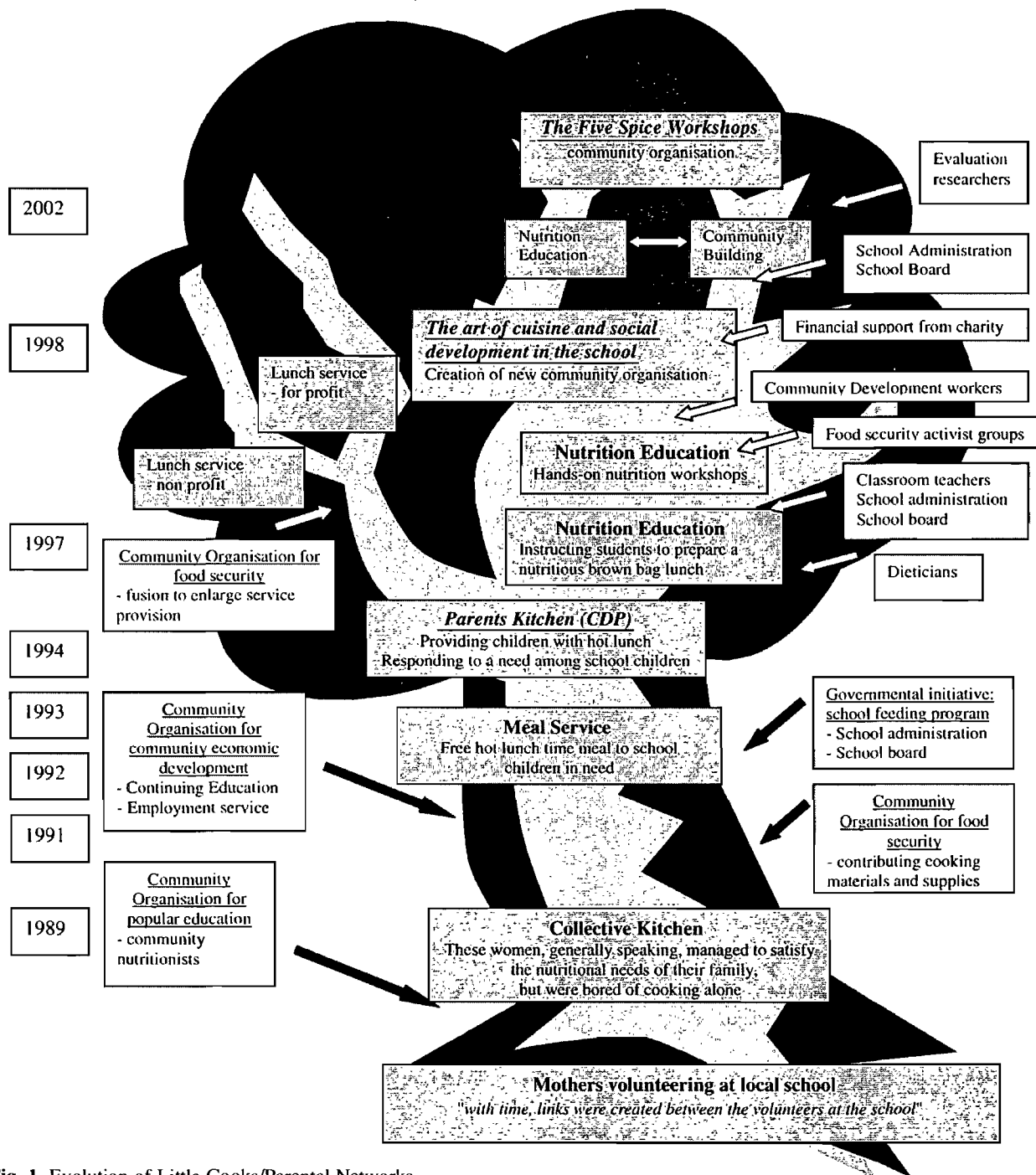


Fig. 1. Evolution of Little Cooks/Parental Networks.

to a value of togetherness and represented an activity to break the monotony and solitude of preparing family meals alone. Thus, the collective kitchen began in 1989 with a group of mothers whose pri-

mary interest was neither financial nor nutritional, but rather social. In time, mutual support, affection and encouragement permitted a less self-serving value to appear within this collective and a pre-occupation

with the school children and the quality of their lunches. The fruition of this interest into a concrete response was facilitated by the professional credibility of the community nutritionist who provided access to a school-feeding program offered through the government. Fueled by a concern for the community's children on the one hand and by the public health value of feeding underprivileged children on the other, the mothers expanded the techno-gram to include a free hot lunch service.

Controversy eventually arose as a result of this expansion. Eligibility for the government-feeding program required certain conformity in program deliverables, including food safety and participation. Such requirements assured the inclusion of health professionals such as nutritionists. While the growth in the program revealed an important need from within the school community, the existent resources were not able to meet the large increased demand for lunch services. Due to the mothers' strong presence in their community and the professionalism associated with the collective kitchen and food service techno-grams, this initiating actor network attracted the interest of established local community organizations willing to support the need for resources. This contribution increased the number of actor networks associated with the program, inevitably resulting in the negotiation and inclusion of new and varied interests. Two seemingly divergent techno-grams appear during this iteration: continuing adult education and employment service. This period can be described by an expansion of the definition of food security from being centered uniquely upon food acquisition, preparation and quality, toward a more encompassing conceptualization associated with community-building values such as self-betterment and collective support (i.e. continuing education and employment). This common underlying value drove the program and permitted it to evolve as one unified program.

This program iteration is also characterized by the expansion of community partnerships, where the newly associated actor networks representing local community organizations did not have professional or institutional interests. Although the pro-

gram was initiated upon a community-professional partnership (i.e. between mothers and nutritionists), the identity of the initiating actor network was associated with its composition of community members. It was through this identity that the initiating actor network had a legitimate community voice and could continue to represent an expanded problematization of food security through the introduction of new actor networks. The professionalism associated with the presence of the nutritionist facilitated this legitimacy but did not define it. The actor networks associated with the education sector likely recognized the importance of good nutrition in general and perhaps to learning in particular, however, at that point they did not have a distinct interest in the program apart from supporting the minister's food service program. As suggested in the next section, this may have been due to a perceived distinctiveness between food service and educational mandates.

### **The second iteration: interest divergence and program rupture**

The second program iteration, from 1994 to 1998, is marked by a continued growth of the hot lunch service techno-gram together with a reinsertion of the educational and nutritional actor networks. While food security remained the focal point of the program, controversy arose during this period due to a divergence in problematization. The initiating actor network increased its level of expertise, expanded the lunch program and formalized itself into a community organization 'Cuisine des parents' ('Parents Kitchen' hereafter referred to as CDP). Meanwhile, children who participated in the food service program were advancing into their final years in elementary school. This triggered the initiating actor network to reflect upon the need to prepare these children to fix their own lunches. This new interest revealed a shift in values from serving those in need, to building self-serving capacities. Consequently, the initiating actor network attracted the interest of educational and nutrition actors, which resulted in the appearance of a new techno-gram. In 1995, the community organization hired a community nutritionist to teach Grade 6 children



how to prepare healthy brown bag lunches. This nutrition education lesson was given during class time, and represented an important shift in the program. By literally moving from the school cafeteria to inside the classroom, the techno-gram inadvertently captured the interest of the educational actor network, which would inadvertently result in changes to the techno-gram's form.

This phase is distinguished by the development of a new professional partnership between actors from the health and education sectors. The appearance of the expanded problematization of food security to include a role in education captured the interest of several schoolteachers who were willing to open their classrooms to the proposed nutrition education lesson. This joint interest and joint professionalism between educators and nutritionists resulted in financial assistance contributed by the school. The presence of these actors influenced the form of the techno-gram where professionalism and standardization became one of its key features. When a new initiative from the Minister of Education to increase support to health education was presented, other schools were enticed into acquiring this nutrition education techno-gram. The techno-gram was introduced into several new schools as a standard program which educated students on nutrition principles through a hands-on cooking activity teaching children to prepare a range of nutritious meals.

Two distinct problematizations associated with food security were seen during this phase. One actor network focused its approach on a food service and community-building perspective and the other on an educational and behavior change perspective. In addition, part of the momentum of the growing nutrition education techno-gram was attributed to its professional identity. Consequently, the initiating actor network, composed principally of parents and community members was no longer a legitimate representation for the program which now included a nutrition education techno-gram. Together, the divergence in the problematization and the distinctiveness between the two actor networks were associated with the corresponding techno-grams, forcing program rupture. This rupture was characterized by the appearance of two distinct programs,

each with a distinct actor network, legitimately representing the program. One actor network was from the initiating parent actor network and the other from the nutrition actor network.

### **Third iteration: expanding a new program and meeting a new controversy**

The credibility of the nutrition education techno-gram was associated with its uniqueness and high level of expertise and professionalism. In this sense, the techno-gram was advanced or 'sold' as a complete package, somewhat closed to the input and influence from actors outside the nutrition actor network. While this feature of the program facilitated its creation as a distinct identity during its initiation, in order to survive the program needed to capture the interest of other actors, thus requiring an expansion in its associated problematization. The food service techno-gram became a routine service within several local schools. Due to the efficiency with which it operated, the program was extended into schools outside the original community, with the provision of lunches for profit. This enterprise fused with another community organization with a similar mission, and left behind its identity as CDP, along with several of its community-building techno-grams. While staff was principally composed of community members, the continuing education and employment services did not continue as an integrated component in the program. This specialization, stability and routine may have facilitated the institutionalization of food service techno-gram in the schools.

The nutrition education techno-gram continued to be identified as a high quality nutrition education program. While partial support for this program was provided through a governmental initiative and participating schools, in order to advance the quality of the techno-gram and its expansion into the school timetable, additional support was required. The program became associated with a provincial 'activist' group for food security and with a local food security community group. While these affiliations provided the program with the recognition it needed to solicit the financial support

of local charities, this expanded network also brought in new agendas, mainly based upon an expanded problematization associated with food security. A new program title 'Projet d'apprentissage à l'art culinaire et à la responsabilisation sociale en milieu scolaire' (The Art of Cuisine and Social Development in the School) captured this larger community focus which reintroduced community-building principles targeted at parents into the program. A private charity provided financial support for the program to advance into successive grade levels and new schools. This phase also saw changing interests on behalf of the schools subsequent to educational reforms stressing the need for schools to establish links with the community [28]. With a greater presence in the school and financial support from a private charity, pressures on the program to demonstrate effects were inserted, resulting in the introduction of an evaluation research actor network from a local university.

During this period, the name of the community organization changed to 'Ateliers cinq épices' (Five Spices Workshops) to represent its new and distinct identity. Likewise, the techno-gram was formalized and named 'Petits cuistot-Parents en réseaux' (Little Cooks-Parental Networks) to represent both the nutrition education and the community-building components. Although social development workers were mandated to create and implement community-linking techno-grams, the nutritionist representation significantly outnumbered and outweighed representation from social development. Controversy regarding the appropriateness and effectiveness of social development techno-grams ensued. While the nutrition education techno-gram was well developed with a clear and understandable objective among the nutritionist and educational networks, the techno-grams which would allow the program to create and/or link to parent and community networks were not clearly defined nor agreed upon. Indeed, controversy increased during this phase due to the inability of the nutrition actor network to act as a legitimate spokesperson for the new program which included a social development component.

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## Discussion

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We present a model representing the evolution of a school-based nutrition intervention in the form of a genealogy. This model highlights the role of the actors' interests and values as unavoidable and desirable parts of program implementation and transformations. In this respect, the actors became engaged during the various iterations and differentially defined food security based upon their professional and non-professional interests and values. These problematizations gave form to program services and activities which evolved over time in interaction with shifts in the actor networks, their interests and values. Program rupture occurred when the actor network representing the program was not accepted as a legitimate representative of the interests of the involved actors. Findings also revealed a role of ancestry. As in the first program iteration, the third one describes food security as a social issue, whereby the techno-gram included a collective cooking activity aiming to build dietary capacity and facilitate the creation of associated parental networks.

Knowledge about program implementation in health promotion and health education has primarily been derived from theory of diffusion models [29]. These models have been criticized for their technical-rational perspective [15] where, for example, the adopting system is oversimplified as a group of unified rational actors [18]. While political and organizational structures of the adopting user system were added to these models and exposed an added level of complexity to implementation theory [1], their application often portrays implementation as a linear movement which is more or less facilitated by the nature of the organizational climate [30].

Notions of rationality or linearity have diminished considerably over the past few decades in the public policy implementation literature [31]. Current literature builds upon a conceptualization of the implementation process as a complex and lengthy chain of 'decision points' [32] involving actors with competing values, conflicting interests

and power differentials resulting in inevitable transformations from policy intention to practical reality [33]. In education, implementation of innovation considers the organizational learning culture in the schools [34], where for example, research into educational change asks how beliefs about teaching, learning and change are formed and reinforced, and how these beliefs influence the interacting roles which guide behavior as it relates to change [35].

The concepts problematization and controversy elaborated upon within the actor-network theory explain how compromise is negotiated between conflicting interests. This theory has been used in the field of health care management [18], where the process of implementation is shown to be dynamic, consisting of a coevolution between the network of supporting actors and the innovation. The analysis presented here is situated in the actor-network theory and thus provides empirical evidence supporting the conceptualization of implementation as a dynamic process involving the interests and values of supporting actors in interaction with the innovation. This perspective joins those approaches within the larger literature of implementation by recognizing that change is played out among people in interaction with institutional, organizational or cultural structures.

The degree to which a program adapts to local context has been referred to as a 'fidelity versus fit' tension [36]. For some, high fidelity to the critical elements of the program is essential, while for others, programs need to be reinvented or adapted to the needs of the various program actors [10]. A certain level of adaptation appears to be inevitable to preventive interventions [37]. Perhaps the dichotomization of debate into 'for' or 'against' adaptation, preclude advancing understanding of how actors interpret and interact with the program and the influence this may have on the program. As exemplified here, it is possible that when the program adapts to the interests of various actors the critical elements, in terms of sustainability and/or effectiveness, emerge or are inserted into the program. It could be argued, that despite attempts to narrow the problematization of food security to either food service or nutritional education, by virtue of its

openness, the critical elements associated with community building were inserted into the program. Restricting access to the program based upon a fixed definition of program contours may lessen the program's chances to effect change.

Despite debate over the appropriateness of fidelity to program planning, practical experience indicates that school-based programs are rarely implemented as planned [9–12]. While poor program implementation is often explained as a disjuncture between program and organizational goals [9], the reality likely reveals that with some flexibility, program implementation can evolve through a reconciliation among the values and goals unique to the implicated actor networks [15]. Models have been created to help program planners document changes in program plans and design over time [16] and may stimulate discussion to help planners widen their field of perception and consider how actors' spoken (and unspoken) interests may have been implicated in these changes. Planning also provides the opportunity for the contours of the program to be openly negotiated and thus may be most effective when interests, values and various power differentials among the actors interact with the innovation over time.

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## Conclusion

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Programs, like innovations are progressive. Tracing the successive transformations of a nutrition program as a social innovation process exposed a movement which is implicit to a program. This movement is based within the range of possible definitions and responses which can be given to a health problematic by the people involved. Over time, these definitions, and the ability of the services and activities to respond to them are successively reinterpreted. The evidence presented for the PC-PR program demonstrates this process, suggesting that health promotion programs may be most effectively utilized and effect change when permitted to develop new responses to health issues over time based upon the changing needs and interests of the people involved.

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## Conflict of interest statement

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None declared.

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## **ARTICLE TWO**

Bisset, S., Daniel, M., Potvin, L. Exploring the intervention-context interface : A case from a school-based nutrition intervention. This paper is in preparation to be submitted to the American Journal of Evaluation.

## ABSTRACT

The appearance of anomalies among the findings of large scale systematic reviews together with opposing viewpoints on the appropriateness of guiding theoretical frameworks for program implementation strongly suggests the need for an alternative theoretical framework to study health promotion programs. We propose a conceptual apparatus from the Actor-Network Theory as suitable to advance knowledge on program implementation. This is a instrumental case study of a nutrition intervention delivered by community nutritionists to elementary school children living in some of Montreal's most disadvantaged neighborhoods. Data collection and analysis were guided by a set of concepts from the Actor-Network Theory. Data are derived from semi-structured interviews completed with the six program interventionists (i.e. nutritionists). Analysis describes the community nutrition interventionists' collective representation of the micro-processes by which they aimed to build a socio-technical network of alliances with the educational stakeholders. Findings identified nutritionists as pre-occupied with three overarching goals during the implementation of the nutrition workshop whereby goals were found to take form interactively with the interests of the program participants (primarily students) and stakeholders (primarily teachers). Additionally, nutritionists were found to translate the program's techno-gram such that it provided a legitimate response to participants and stakeholder needs (or goals). These findings expand our conceptualization of what a program is, and how it becomes 'enacted'. Namely, in contrast with conceptualizations of program implementation as an instrumental process which conforms more or less 'automatically' to program theory, findings reveal program implementation as essentially a social process whereby interventionists translate program operations as a means of negotiating with program stakeholders.

## INTRODUCTION

Systematic reviews on school based interventions to prevent obesity suggest a need for a new conceptualization of what is happening during program implementation in order to effectively link program events to outcomes (Doak, Visscher, Renders, & Seidell, 2006; Knai, Pomerleau, Lock, & McKee, 2006; Sharma, 2006; Summerbell, Waters, Edmunds, Kelly, Brown, & Campbell, 2007). In particular, findings and recommendations from these reviews suggest that implementing programs with high fidelity to a program theory may not increase the program's chances of imparting positive impacts. In particular, the Cochrane review on obesity prevention recommended that interventions with "stakeholders in the decision making regarding the potential strategies to be implemented" (Summerbell et al., 2007; pp.34) are more likely to create a supportive environment for sustained action and positive impact than are interventions that met 'gold' standard criteria necessary to determine the program's causal links to outcomes.

Program implementation theory recognizes that a program's technical components are placed into operation by actors with a variety of styles, experiences, interests and perspectives on the program's underlying premises and how they operate *in situ* (Scheirer, 1987; Weiss, 1998). Recent discussions on the conceptual frameworks guiding dissemination research describe innovations as 'entities' that are translated among stakeholders as they adopt roles and means of communications in response to the innovation (Sussman, Valente, Rohrbach, Skara, & Pentz, 2006). However, the identification of these diverse orientations and interpretations, that emerge from people's interaction with an innovation, are utilized for the purpose of reconciling various viewpoints to 'speed up' dissemination or control for effect modifications (Guba & Lincoln, 1989; Scheirer, 1987). Thus, on the one hand, implementation theory describes program implementation as an ongoing interactive dynamic process, but on the other, it suggests program implementation performance can be measured and judged against pre-determined standards. The appearance of anomalies among the findings of large scale systematic reviews together with contrasting viewpoints on the applicability of the dominating theoretical frameworks for program implementation strongly suggests the need for an alternative to traditional theoretical frameworks guiding conceptualization of program



implementation. This study aims to explore program implementation through an alternate theoretical lens to those currently dominating health promotion program evaluation.

Public health intervention research has begun to dispute the role assigned to implementation evaluation as tracing an idealized efficacy-to-effectiveness diffusion model (Glasgow, Lichtenstein, & Marcus, 2003; Hawe & Riley, 2005). Newer approaches aim to “embrace and study the complexity of the world” (Glasgow et al., 2003; pp. 1264) where complexity refers to the nature of interventions (i.e., client characteristics, preferences, and behaviors, staff training and expertise), the social contexts (i.e., settings) in which they are implemented and their “inherent interactivity” (Glasgow et al., 2003; pp. 1263). However, by revisiting the concept of generalization and advocating for efficacy studies to collaborate with stakeholders and account for moderating variables (e.g., participant, interventionists and setting characteristics), implementation frameworks arguably do little to advance understanding of the “inherent interactivity” which occurs at the intervention-context interface. The limitation of capturing the complexity with descriptive characteristics of stakeholders is acknowledged whereby intervention theory is understood to emerge from the dynamic contexts where interventionists “interpret, translate, subvert, or deploy” (Hawe, Shiell, Riley, & Gold, 2004; pp. 790) the official project rhetoric with the socioenvironmental contexts of their practices.

Exploring the interface between people and innovation is at the heart of social studies of technology. Public health interventions can be studied using the conceptual tools of social studies of science and technology, recognizing that health interventions are themselves a form of health technology (Lehoux, 2006). The underlying premise of such research is that through their interests and values, people are intimately connected with the formation and manner of use of innovative technologies, and that these interactions take place over time and in settings often different from those in which the innovations were originally evaluated. Through knowledge and fact-building, innovative technologies are constructed through interactions with people, where fact-builders (or practitioners) develop strategies to make sense of these interactions. The presence of such complex interactions between public health interventions and contexts has been acknowledged (Sussman

et al., 2006) and demonstrated by empirical evidence showing that interventions are dynamic social systems built upon iterative social processes (Bisset, Cargo, Delormier, Macauley, & Potvin, 2004; Pluye, Potvin, & Denis, 2004; Potvin, Cargo, McComber, Delormier, & Macaulay, 2003) that interact with technical components leading them to be transformed or change form over time (Bisset & Potvin, 2006).

Social studies of technology has a rich intellectual dialogue exploring the translation of technological innovation. This dialogue dovetails with current preoccupations in public health intervention research. While recognizing the complex and interpretive nature of program implementation, knowledge generation paradigms are either geared to the application of best-practice normative standards (Glasgow et al., 2003; Sussman et al., 2006) or lack explicit theoretical propositions such that knowledge of the underlying social process inherent to innovations can be recognized, whereby understanding of intervention implementation can grow (Guba & Lincoln, 1989). Taking inspiration from theoretical propositions from the sociology of translation by Callon (1986b), Latour (1987, 2005) and Law (1999) we will explore the implementation of a school-based nutrition intervention. We do so with the aim of describing the expansion and stabilizing of a socio-technical network in relation to negotiations between actors whose goals become aligned with the program. In a previous work, we used these tools to analyze the transformation of a program through time (Bisset & Potvin, 2006). In this paper we produce an analysis of the micro-processes of the actions undertaken by program operators (i.e. practitioners) in their collective efforts to implement a nutrition intervention in the elementary school setting.

#### CASE STUDY OF A SCHOOL-BASED NUTRITION EDUCATION INTERVENTION

The nutrition education intervention *Petits cuistots – Parents en réseau* (PC-PR) (translated as *Little Cooks – Parental Networks*) is a school-based initiative promoting nutritional and culinary education for primary school children and their families' participation in school activities. The program was initiated in 1989 by mothers who were active in their children's school through lunch-time supervision roles. Based upon their own need for active involvement with their community and

their recognition of widespread poor quality lunches among school children, this small group of women initiated a nutrition intervention which became increasingly professionalized over time (Bisset & Potvin, 2006). Despite several iterations, the program resembles its ancestry through continued parental participation (i.e. Parental Networks) and students' active involvement in food preparation (i.e. Little Cooks). As a community initiative, the program is not based exclusively upon research knowledge of health behavior change theory but rather incorporates lay, health practitioner, and education specialists' knowledge.

A total of eight schools participated in the PC-PR nutrition intervention during the year of this study (2004/2005). All schools are part of the Montreal school board and serve the top 20% of disadvantaged primary school aged children living in Montreal (Anonymous, 2007). Schools were recruited through their involvement with a community initiated program serving lunchtime meals or through the active recruitment of the hosting community organization *Les ateliers cinq épices*. During the 2004/05 school year the program was implemented in kindergarten through grade five classrooms, which included a total of 113 classrooms and 2156 students. The number of students participating in the program per school ranged from 126 to 435 and the number of classes per school ranged from 12 to 22.

The program component "Little cooks" is a nutrition workshop facilitated by community dietitians hired full time by the administrating community organization *Les ateliers cinq épices* (see [www.cinqepices.org](http://www.cinqepices.org) and [www.cacis.umontreal.ca](http://www.cacis.umontreal.ca) for activity reports). Each of the eight annual workshops was specifically designed for each of the 6 grades that form primary schooling in Quebec. Workshops feature an instructive component on a food item and theme, along with a practical component with a recipe guiding students in small groups through the preparation of the featured food, finishing with a tasting experience. While the nutritionist leads the nutrition workshop, the classroom teacher is present to provide classroom management and program support. Teachers are also asked for support prior to the workshop by way of a preparatory exercise. The content of the workshop includes instruction on food preparation, food types, nutrition content and health benefits of food, alternative or uncommon foods, cooking procedures and techniques. In

addition, preparatory and reinforcement activities are proposed to teachers to integrate notions related to food, nutrition and recipes into regular curriculum such as mathematics (use of fractions) language, social studies or biology. The recipe and a tasting sample are provided to students as take home examples of their cooking experience, which provides a link to the “Parental Networks” component of the program. Parents are also invited to volunteer and assist with the nutrition workshop. Parent volunteers may also be met by a community development worker, working full time for the PC-PR program. In this respect, the families of participating students are invited to take part in extra-curricular activities which touch upon the food and nutrition themes introduced in the nutrition workshops (e.g. evening dinners, visits to local food producers).

#### GUIDING PRINCIPLES FROM THE SOCIOLOGY OF TRANSLATION

Although stakeholders are recognized to be interpreting interventions which are translated during implementation, implementation models do not facilitate inquiry to uncover these social processes. According to the sociology of translation one factor that limits the ability of diffusion models to consider how and why innovations are interpreted is the passive role attributed to social groups. Here, people are described in terms of their role as ‘transmitters’ whereby they either take-up or resist an innovation but do not transform it. The sociology of translation advanced by Callon (1986b), Latour (1987, 2005) attributes a rationality as to why innovations may be taken up (or dropped) and how this decision-making inevitably transforms the innovation.

The sociology of translation or Actor Network Theory (ANT) conceptualizes an innovation as a network built from a need to correct or improve a practical situation. The innovation becomes established through alliances formed from the interests and capacities of human and non-human entities. Alliances are dynamic, fluid, and unstable in an emerging network whereby the entities are defining their relationships with one another. The innovation is described as taking form through the ‘work’ (i.e., interpretations, translations, negotiations) of building these

relationships, where relationships occur from a mutual recognition that the other can help with the achievement of their goal.

Implementing a health promotion program into a setting such as a school usually requires the participation of actors whose pre-occupations are not centered upon health, and whose interest to participate in the resolution of a health problem may be low. The actors who are primarily responsible for implementing the program in the school setting (i.e. the nutritionists) are not school employees and therefore in a precarious position whereby, according to theory of translation, the success of their innovation (i.e. the nutrition education program) lies in the alignment of interests with actors whose need for the innovation is uncertain (i.e. teachers, students, parents). The theory of translation describes this process of ‘interesting the otherwise uninterested’ and aligning interests that were previously unrelated as a basic social translation process. In this light, ANT was identified as being relevant for our study of program implementation in the school setting.

## METHODS

Within this expansive field of ANT we have aimed to extract a small, manageable and useful vocabulary suited to an insightful understanding of the process of program implementation. In this respect, we test the theoretical proposition that the focal actor group actively builds new connections and stabilizes existing ones by making compromises and negotiating the use and utility of non-human actors. Applied to an empirical case of program implementation, this proposition posits that program practitioners will represent the program activities as being an indispensable response to the needs within a particular school.

We present a case study centered upon the representations of program interventionists with respect to their collective actions, work and intentions, implementing the PC-PR program. In this respect, we refer to the program-classroom interface where the program interventionist meets the school personnel, the parents, and the students. Cross sectional data were used for the purposes of the current study and were obtained through interviews with all six project nutritionists of their experiences working with one hundred and thirteen classes (kindergarten to

grade 5) across eight participating elementary schools. Interviews were performed between March and April, 2005 and lasted from sixty to ninety minutes. Interviews were recorded and transcribed verbatim.

Data collection and analysis took conceptual guidance from ANT and its proposed methodological approach to ‘follow the actor’ (Callon, 1986b; Latour, 2005). The underlying premise of this approach is that actors know what they do and as investigators we have to learn from them not only what they do, but how and why they do it. Using this analytical framework, we describe the implementation of the PC-PR program through the accounts given by a focal actor group, (i.e. nutritionists). The semi-directive standard interview queried nutritionists’ interpretation of the underlying premises of the program, their work with school personnel, students, parents and other intervention workers, and their impressions of how this work interacted with the program operations, and their expectations regarding potential outcomes.

Following from the definition of an innovation as a network of social and technical entities whose interests and capacities become aligned with one another through the work of actors, we analyzed the nutritionists’ accounts of their work to build connections and align program’s interests with those of the education stakeholders. The analytic approach taken to identify and describe the connections which form the PC-PR program was inspired by an empirical work applying the sociology of translation (Callon, 1986b). This work describes the social processes through which a focal actor group (i.e., *primum movens*) builds a network of alliances between social and technical entities in order to advance their own interests. Social entities constitute a *socio-gram*, and technical entities constitute a *techno-gram*, and together they form the ‘stronghold’, a network through their capacity to respond to the other’s limitation(s). The sociology of translation uses four discernible yet overlapping ‘moments’ of translation to outline the processes through which the socio-gram and the techno-gram each contribute to the formation of a network. The present analysis, however, focuses upon two of the four ‘moments’ of translation, namely, the nutritionists’ attempts to define their interests in relation to other actors’ and entities’ interests and become indispensable (i.e. *problematization*), and the strategies taken towards this effect (i.e. *interessement*).

In this respect, nutritionists can be understood to ‘strengthen’ the network by negotiating goals and compromising roles among the social actors (i.e. socio-gram) in relation to the operation of program and educational non-human entities (i.e. techno-gram).

Coding began by identifying the human actors to whom the nutritionists referred. In accordance with sociology of translation, human actors are individuals or collectives whose role within a network becomes mobilized through a *problematization*. *Problematization* was recognized when nutritionists described their own as well as others’ goals (i.e., who they are and what they want), and in so doing, identified a role for themselves in order for the *problematized* actors to overcome a limitation and get what they wanted. Interviews were thus deductively coded for *problematization*. *Problematization* was operationalized by coding interviews with the name of the actor (e.g. Teachers, Students, Parent, Nutritionist, Educational Director), followed by an Identity code of who they are (i.e., qualities, qualifications, capacities, expertise, role and identity) and a Goal code of what their interests were (i.e., interests, goals, pre-occupation). Once all the interviews were coded for *problematization*, ‘higher order’ or more abstract Identity and Goal categories were induced from the descriptive codes. Identity and Goal categories with their descriptive codes were then sorted according to the interview to identify how Nutritionists collectively *problematized* the actor network and the role they attributed to themselves in this respect.

Next, following the same process outlined for *problematization*, interviews were coded for *interressement*. *Interressement* codes were grouped into higher order categories and the content of categories was compared and contrasted across Nutritionists. *Interressement* was operationalized by coding for instances where the nutritionist took strategic action to reduce an obstacle or increase an opportunity toward the resolution of an issue. In accordance with the sociology of translation, reducing obstacles and increasing opportunities occurs through negotiation whereby the focal actor group weighs the risks and benefits of compromising her role and goals in order to respond to the explicit interests or pre-occupations within the network. The substance of these negotiations takes form through mediators which are described as anything that “passes between actors in the course of a relatively

stable transaction” (Latour, 1999; pp.25). Negotiations are understood as transactions where non-human entities take on value through their capacity to respond to the interests of the actor(s) in the network. Thus, non-human entities and their collective functioning in the form of a techno-gram were analyzed for their role as devices of *interessement*. Non-human entities could be tangible such as food or a cooking utensil, or it could be non-tangible, such as knowledge or ability. Non-human entities could also be used to organize human activity (i.e., meetings, a lesson plan, a work method, timetable).

Analysis proceeded through an iterative process of abstracting and connecting the collective *problematizations* to the *interessement* strategies, and by verifying these associations back against the raw interview data. By beginning with the overarching goals, which were common across all nutritionists, the *problematizations* and the strategies that followed were sufficiently abstract that they could capture a broad representation of the socio-technical network as it was shared across nutritionists. While the analysis of the interviews also identified variations in these formulations between the nutritionists, this presentation of the analysis, however, does not explore the inter-nutritionist variation in the operation of the socio-technical connections.

A validation process was set up to ensure that the coding of the interviews captured the underlying conceptual framework and that the collection of codes into higher order categories was trustworthy. A qualifying check by an external coder with good knowledge of the sociology of translation and the PC-PR nutrition intervention was used to assure the framework guided data analysis in an accurate and consistent manner. Namely, the coding of the interview was reviewed by an external reviewer and discussions between the analyst and the reviewer on the appropriateness of the codes pursued. Additionally, the analyst checked her understanding of the moments of translation and its practical application to the data during a qualitative research discussion group, which took place on a monthly basis.

Findings present strategies taken by the nutritionists as a collective during the assembly of pertinent connections expanding and stabilizing the PC-PR socio-technical network through classrooms and participating schools. **Bold text**



illustrates the connection the nutritionist aims to establish, *italic text* refers to the identity and problematization attributed to an entity, with respect to who they are (qualities, qualifications, capacities, expertise, role and identity) and what they want (interests, goals, pre-occupations, aims). Underlined text refers to the strategy used by the nutritionist in order to respond to the interests of the entity that she has defined.

## RESULTS

The findings indicated that nutritionists were pre-occupied with three overarching goals during the implementation of the nutrition workshop. These were, respectively; i) connecting students to their future health; ii) optimizing the nutrition workshop functioning; iii) assuring the long term stability of the intervention in the school. In addition to justifying these goals based upon what was in the ‘best interests’ of students and the responsibility of the school as a public institution, nutritionists appealed to the interests of the program participants (primarily students) and stakeholders (primarily teachers) to connect their goals with those of the program (Figure 1). By identifying this diversity of interests and explaining how they became inserted into the program, the findings revealed program implementation as a process of translation. Here, nutritionists translated her role and the operation of the non-human entities of the intervention such that they provided a legitimate response to participants and stakeholder needs (or goals) and in so doing, aimed to expand and stabilize the connections of an emerging socio-technical network. Two overarching coupled processes were found to underpin nutritionists’ strategic actions to build alliances between student, educational and health interests. The first process describes the nutritionists’ negotiations between their health professional pre-occupation to **connect students to their future health as adults** and students’ pre-occupations and needs to experience success and enjoyment at school. The second process describes the nutritionists’ negotiations between their goal to **connect nutrition education with the education institution** and those of the education stakeholders to make efficient use of the timetable, deliver a comprehensive education program and build links to the community. By following the assembly of these connections we capture the ‘movement’ of the program

through the dynamic interplay and co-formation of the program's socio- and technogram.

### Building alliances between students, education and health

Through their primary role as *animators of the nutrition workshop*, nutritionists aimed to connect **students and their future health as adults** through the prevention of adult onset disease associated with poor diet. In this respect, students were identified by nutritionists as being *at risk for preventable diseases associated with poor diet* due to trends in modern society where youth are increasingly *disconnected with food* through the *loss of culinary traditions* and *reduced diversity in food choice* and a *proliferation of misinformed consumers*. Nutritionists further described parents as having the potential to add to student risk through *lacking the knowledge, know-how* or the *time to role model* healthy eating practices. In this respect, nutritionists built a clear connection between themselves, as health professionals and the future health of students. By creating interest in food and cooking, the nutrition workshop was identified as *providing students with essential tools* to take care of their health.

*“If they (students) have interest in food and in cooking, an interest in health will follow”*

Given that healthy children are generally uninterested in their health, nutritionists devised strategies to make food and cooking interesting to students in ways that extended beyond health, for example;

*“...we create interest and motivation in relation to school. Students are motivated to go to school...”*

Three approaches were found to describe how nutritionists built aligned interests with students; **reinforcing familiar connections with food** and **creating new connections with food** and **expanding students' interpersonal connections** with fellow students and family members.

According to the Nutritionists, the educational institution has a *responsibility to protect students* against chronic disease by providing them with the tools they need to develop healthy dietary practices. However, for the Nutritionists, schools could not assume this responsibility as they *lacked nutrition education expertise, time and resources*. In this light, Nutritionists further established themselves as having an essential role within schools. Schools assumed this responsibility by providing Nutritionists with a place on the curricular timetable. However, nutritionists identified this placement as precarious due to the *unstable and unpredictable environment* in schools that *do not provide dependability*. Moreover, as *the spokesperson for teachers*, the director of the school often *accepted the nutrition program on behalf of the entire school*. In some schools, this legitimacy to speak on behalf of teachers was questioned, and in these circumstances Nutritionists described teachers as being *obligated to forfeit space from their timetable*.

Nutritionists defined themselves as having a dual role in the school, namely, to animate the workshops and to work in collaboration with the school personnel;

*“my tasks...well, concretely speaking, this would be to animate the workshops, but you know, this is also to work in collaboration with the team at the Cinq Epices, but also with the particular setting of the school, with teachers, directions...we, the nutritionists are the link between the school and the program”*

Linking the school and the program was also described as wanting *“to be integrated in the sense of becoming part of the furniture”*, where becoming integrated meant that *“the program becomes necessary, that it makes up a part of the school lessons”*. In this way, nutritionists identified the need to become essential for the educational institution and the associated stakeholders in ways which were not uniquely connected to health. In this respect, nutritionists were aiming to build a network which included both the school’s social (i.e., teachers and students) and non-human (i.e. school lessons, educational program) entities. Two over-riding approaches were found to describe how nutritionists worked to align interests with the school; **connecting the educational institution with nutrition education and the nutrition workshop into the teacher’s timetable.**

## Building Alliances with Students

### **Reinforcing familiar connections with food**

By reinforcing familiar connections with food, nutritionists emphasized the value of food as a means to good health which was available and accessible to students. Here, health was conceptualized as *'happening' in the future with absence of disease* and food was identified as *having protective value* against adult onset disease. The strategy by which this connection was established was described as building healthy eating knowledge and know-how. The non-human entities, knowledge about food and cooking tools, were respectively enacted in order to bring out the *nutritive value of food* and the *technical meaning of food*. In this respect, nutrition knowledge transmitted the *nutritive value of food* and illuminated the nutritional composition of food which gathered food into groups, and associated food groups and food properties with healthy physiological functioning. Nutrition knowledge also contributed to the formation of the socio-gram by *defining the nutritionist's professional identity*, which was clearly recognized by Nutritionists as building their credibility among school personnel.

Manipulation (i.e., utensils) and instructive (i.e., recipe) cooking tools were associated with the *technical meaning of food* by prescribing the manipulation of food according to *standardized procedures*. Students interacted with the manipulation utensils (e.g. knife, measuring spoons) using the recipe's *prescribed procedure* (e.g. cooking methods) in order to build cooking abilities (i.e. dexterity, coordination and comprehension). The technical entities were enacted in a *controlled synchronized process* where the process *needed to be carefully observed and controlled* in order to build cooking skills such that the recipe could be repeated at home;

*"... By doing your job with everyone watching, then after you watch what the others do, this means that (the student) will be more capable if he wants to redo it at home"*

Problematizations of students which identified a need for strategies to build healthy eating knowledge and know-how were associated with a socio-gram which valued health education as a means to achieving health. Here, Teachers were identified as having health and wellbeing goals for themselves and for their students, whereby their interests were in alignment with Nutritionists who enacted food as having nutritional value and technical meaning. In contrast, the enactment of nutrition knowledge and cooking tools would be less in line with this strategy when the socio-gram did not place value in health education as a means to achieve health. In these circumstances Teachers were identified as *modeling poor dietary practices to students* and as describing the nutrition workshop as “*just a cooking class*”.

### **Creating new connections with food**

By creating new connections with food, nutritionists identified food as a *multi-dimensional complex* entity which was *commonly misunderstood* and *oversimplified*. Here, food was something to be explored and experienced with open mindedness and freedom. This strategy, described as guiding students toward discovering food in new ways, was associated with a problematization of students as needing school experiences where they could *learn by doing* and *experience success*. This strategy describes a negotiation in the enactment of nutrition knowledge and cooking tools to respond to what students themselves wanted and needed as opposed to what was in their ‘best interests’;

“...I can see, you know, they (students) have a need to discover things...with food, we can do this in a way that is different from school...I really see that they have an interest for this.”

“...there are children who are always getting put down, made to feel (they) are not good. By cooking, they can see that they can be good, that they are capable, and that they are OK. Each child who participates in the workshops experiences a success with school.”

Accordingly, the non-human entities, knowledge about food and cooking tools were enacted in order to bring forth the *explorative and experiential value of food*. Information about food was not exclusively grounded in the professional expertise but rather revealed how food connected students *to people and places both near and distant* through people's lived experiences. By collecting information about food from students' experiences and observations, traditional and religious practices, this strategy aimed to engage students by building shared knowledge about food. The cooking tools were associated with the *experiential value of food* and the *self-achievement value of food* whereby students were given freedom for trial and error. Students interacted with the cooking tools in order to build an experience whereby their participation in the process of preparing food was associated with success. Here the cooking tools became enacted with a *chaotic rhythm* where the process *needed to be sufficiently loose and challenge students* and in so doing, this techno-gram responded to students need to *participate in a decision making process* in order to *build autonomy* and a *sense of accomplishment*. Experiencing new tastes and textures also identified a *taste value of food* as something that could be *discovered and determined by the student*, and, by presenting food as having a *potential to be liked or disliked*, food *validated individual preferences* and *attributed students with the reward* of venturing into the unknown, to further reinforce the *self-achievement value* of food.

When non-human entities were expected to emphasize the experiential value and self achievement value of food, expectations regarding the role students and nutritionists would assume changed accordingly;

*"... the students were not autonomous...there were many things that they took for granted, because we placed the measure with the ingredient at the right place. It was us (the nutritionists) who directed everything all the time."*

### **Expanding students' interpersonal connections**

Nutritionists also aimed to build aligned interests with students by **expanding the students' interpersonal connections** with fellow students and with family members. Students were identified as wanting to “...*have the feeling that they are a part of something*” at school with other students and in response, nutritionists devised a strategy described by highlighting collective success and identities. Students were also identified as wanting to *play a larger role in the home* in terms of showing off capacities, informing and influencing family practices. In this respect, the nutritionists' were providing usable and applicable information and sending student's accomplishments home. In contrast with strategies seen up until now, this strategy was not centered upon food, but when enacted, it used food as a medium to build interpersonal relationships. A new non-human entity, the student workgroup, appears whereby the enactment of cooking tools is situated within a cooperative learning techno-gram.

Cooking tools were distributed among students in small groups such that they had *collective ownership among the group members*. In this way, the student workgroup *imposed co-dependence* among students for the production of a final product, and *provided the opportunity for co-operation* among them during the interpretation and completion of the instructive recipe. The non-human entities focused the groups' actions upon one collective process aiming towards the completion of one collective objective, where both the process and the outcome *provided opportunity for a collective achievement*.

The completed food sample and the recipe were used to connect students to their parents first by *demonstrating a school accomplishment* and *providing a child-parent activity*. Practical information about food could further link students to members of their family by providing students with knowledge that other members of their family did not necessarily have, and in this way students were expected to be *informing family food purchasing* and *transmitting healthy messages*. Younger students and newly immigrated students were described as wanting to *bring parents into school* to facilitate their transition from the home into the school. The completed food sample, cooking instructions and official invitations also aimed to link parental participation with the school.

This strategy was found to interact with the socio-gram in two ways. First, the likelihood that a food sample would arrive in students' homes was influenced by the students and their home environment;

*“At one point, I really saw the reality, “Who wants mine?”, “You want to give me yours?” ... It was like a traffic! It was nothing like, you know, we say, “Oh, the child is proud to bring this home...”*

In this respect, the food sample took on a distinct role, which was unanticipated by the nutritionists. In addition, the possibility that students would transmit information about food or demonstrate their own accomplishments, could be interrupted by the students experience with their home environment, where *“...it doesn't do anything to bring that at home because the parent will not taste it or will not like it”*.

### Building Alliances with the School

#### **Connecting the nutrition workshop into the teachers timetable**

Nutritionists described their potential to build alliances with students as interacting with teacher *engagement with nutrition workshop*. Teacher engagement with the nutrition workshop was needed in order to optimize its functioning due to nutritionists' *lack of pedagogic knowledge and experience*. In particular, when teachers *offered pedagogic input*, they influenced the form of the nutrition knowledge (content and means for communication) by *advising on developmental learning capacities, preparing the class, suggesting how to improve learning potential, contributing antidotes and controlling class behavior*. This input could increase students' *readiness to learn* which concomitantly influenced the nutritionists' *motivation to share knowledge*. Advising on appropriate developmental challenges provided the opportunity to translate the techno-gram in alignment with teacher and student interest:

*“...the teacher found our functioning a little babyish. Students were disinterested...I received suggestions that perhaps we could change our ways of functioning to bring them (the students) more autonomous”*



Teachers were identified as having an *overburdened workload* or *resource deficit* resulting in *being challenged to complete the educational program*. To avoid adding ‘stress’ to an already ‘stressed’ timetable, nutritionists *avoided imposing upon teachers* by *making light of incomplete work* and *changing or reducing the time allotment for nutrition workshop*. However, reducing the level of imposition upon teachers did not provide the conditions for teacher engagement, where “*teachers embark because they really see that the program shows more than just what to and what not to eat*”. Nutritionists thus aimed to convince teachers that the nutrition workshop was a *valuable and indispensable curricular resource for the efficient use of their timetable* by providing the nutrition workshop as a pedagogic tool;

*“...if we can integrate the project, if the teachers can pass their pedagogic material or their teaching through the workshops, they might not see them as a waste of time”*

For example, information about food was identified as useful to teachers as it reinforced or provided new educational material for geography, social studies, and science and technology lessons. The instructive recipe was also identified in relation to math and reading whereby “*measuring, in a recipe, it is mathematics. Read a recipe, it is French*”. The student workgroup provided a key resource for teachers to deliver and evaluate the ‘reform’ components of the QEP, where;

*“The teachers, this gives them a tool, essentially, that permits them to evaluate the students in contexts that might be difficult to produce in class”*

Nutritionists further aimed at acquiring teacher engagement by building a trusting relationship and professional credibility. Trust was built over time and was associated with the nutritionist going places which extended beyond the time and space of the classroom where she animated the workshop. By *maximizing presence in the school* nutritionists took on a greater role in the school whereby they would *socialize with teachers* and/or *attend staff meetings*. In this respect, getting to know teachers outside the nutrition workshop created the conditions necessary through

which nutritionists *increased trust and knowledge exchange and mutual respect for professional identity*. These conditions were identified as necessary for teachers to *share their impressions and offer input* (i.e. inform the planning and functioning of the nutrition workshop) and also, to regard the nutrition workshop as a *privileged opportunity*.

### **Connecting the educational institution with nutrition education**

Although health education is part of the Quebec Education Program (QEP), nutritionists primarily aimed to legitimate the presence of nutrition education within the educational institution by connecting it with domains within the Quebec Education Program that are outside health. Broadly speaking, the program was legitimated by responding to new components in the QEP which were collectively referred to as ‘the reform’;

*“With the new reform, learning by project, we can touch many competencies with the nutrition workshop at the same time. Teachers do not have time or the resources to create projects like this that respond to the reform. This is a project that is grounded in the reform”*

More specifically, the PC-PR program is described by nutritionists as falling into broad areas of learning curriculum, which, *“like music and art, develops holistic dimensions of individuals”*. Also, with the introduction of the student workgroup, the PC-PR program *“touches many aspects of the reform, like cooperation and collaboration”* thus responding to transversal competency curriculum. In addition, nutritionists identify the approach to learning assumed by the PC-PR program to correspond to the newer approaches identified by ‘the reform’. Namely, food and cooking tools provides opportunity for *“students (to be) working at a technical level, touching, smelling, discovering”* and also for students to be learning in action *“...to do that which (they) learn, while they learnt it”*.

Another strategy used by nutritionists to build alliances between nutrition education and the educational institution was appealing to the educational values

which were part of the school. In particular, while parental participation may have been *enriching for the school*, schools were challenged to obtain parental participation due to parents who were described as *having had poor experiences with school, having negative perceptions of school and being afraid of being judged by school personnel*. Nutritionists identified participation with the PC-PR program of interest to parents *to please their child, find various resources, meet other parents, and get to know the teacher*. For the school, nutritionists identified the PC-PR as being interesting as parents could *see their child having positive experiences at school* and thus ultimately *see the school in a positive light*. Nutritionists also appealed to the teachers own values related to their professional standing among other teachers. They did so by showcasing class's work for all teachers to see and by acting as a messenger, transferring teachers' practices from one teacher to another, nutritionist were appealing to teachers' interest to stay up to date and appealing to an innate sense of competition among teachers.

Appealing to the health values which were part of the school identified the school direction and teachers as *placing value in health education* and permitted nutritionists to align program's interests with that of teachers. In this way, nutritionists presented the program material as attractive for teacher to use towards the fulfillment of their own health goals in relation to themselves and/or their students. Nutritionists might *prepare the recipe exclusively for teachers* which permitted teachers to approach them with personal questions related to nutrition and health. By representing the program as a comprehensive project with a holistic approach to child development, the nutritionist aimed to create aligned interests with teachers whose philosophic interests related to human development went beyond the core educational curriculum:

*“if the teacher sees, if the teacher thinks about the global development of the child, this brings things that the teacher would not have the time to show, it completes the teaching, I find, with health, openness to others...”*

## DISCUSSION

This study aims to explore program implementation through an alternate theoretical lens to those currently dominant in health promotion program evaluation. Based upon ANT, we proposed that program practitioners would represent the program activities as being an indispensable response to the needs present within the school. Empirical results illustrate the implementation of a health promotion program as a process of continual negotiation between interventionists, participants, and stakeholders. This framework, applied to the case of a school-based nutrition intervention, has revealed the strategic nature of negotiations operated by nutritionists aiming to align the goals of the nutrition education intervention with those of the school. This finding contributes to advancing understanding of the intervention-context interaction by bringing forward the substance of this interaction as occurring between human actors and other human and non-human entities whose actions align with one another only in accordance with their ability to respond to one another's interests. It also further disputes the simplistic trajectory image of an innovation by illustrating that the social actors, upon whom the existence of the innovation depends, will inevitably insert new interpretations and use an innovation's technical entities, such that it takes on meaning to them.

According to Callon (1986a) and Latour (1999), the spread or take-up of an innovation occurs only when the associated actors make an investment or contribution to its form. This form can be held relatively constant when contributions are kept in alignment with the interests to which the innovation is responding. Interventionists thus occupy the pivotal position during implementation. Our semi-directed interview schedule did not specifically require nutritionists to identify educational stakeholders, nor to elucidate their needs or interests. However, data analysis not only revealed educational actors and entities to be represented in this way, but found nutritionists to correspondingly negotiate their own goals in relation to these interests. Described in this way, our results support those of others who have described the complex nature of the practices through which practitioners implement interventions (Schwandt, 2005). Contrasted with practice viewed uniquely as an instrumental device for scientific rationality or 'best practices', this perspective views program implementation practice as a hermeneutic reasoning

involving “an interpretation of the situation based on understanding or grasping the relevant features of the case at hand in concert with values, principles, and standing commitments, such that one is able to see an appropriate and effective way of acting” (Schwandt, 2005; pp. 98). Nutritionists did not uniquely rationalize the enactment of the non-human entities of the program in relation to a problematization of students that corresponded to her identity and goals as a health professional. By translating these non-human entities to become aligned with the interests of educational stakeholders and participants, nutritionists were interpreting the intervention based upon the needs of these education actors, while simultaneously staying true to their health promotion goals.

While the PC-PR program does indeed have a formalized structure that is consistently operated, the socio-gram differed across settings, which had an influence upon the ways in which nutritionists enacted the program’s non-human entities. For example, some Nutritionists encountered Teachers whose interest in nutrition education was low and consequently altered the presentation of the technogram such that it corresponded to educational requirements. Other Nutritionists were less pre-occupied with making these adjustments as Teachers tended to value health education. Thus, where adjustments were needed, nutritionists described themselves as having the freedom to make adaptations. The literature has suggested the undesirability of adaptation in favor of fidelity to health promotion intervention in schools (Dusenbury, Brannigan, Falco, & Hansen, 2003). Contrasted with an understanding of adaptation as an option which may or may not be suitable based upon arguments that adjustments weaken program dosage or alter program theory, the findings of this study suggest that adaptation may be an essential strategy, and as such, a rationality to include stakeholders in the formation of the program, in order to impact the program’s functioning, relevance and longevity.

Even when the operation of the non-human entities of the program appeared as relatively stable (i.e. using cooking tools to prepare food) they were rationalized as responding to the needs of the participants and stakeholders and consequently, were differentially characterized by their rhythm, co-dependence, and autonomy. While subtle, adaptations such as these to respond to the needs of the stakeholders and participants likely influences their motivation to integrate the messages. In


general, implementation research has not recognized practitioner strategic actions in this respect. An analytical framework permits the rationality of the practitioner to be ‘followed’ through the construction of connections, responds to a call to revisit an evaluation methodology can capture, not only the occurrence of planned events, but also the appearance of unanticipated events and unplanned goals, which occur as a natural part of a real life intervention (Morell, 2005; Scriven, 1991). In this respect, the ‘follow the actor’ methodology avoids the limits of evaluation methods that focus uniquely on internal monitoring (i.e., events and objectives found within the logic model), neglects external monitoring (i.e., events and objectives that lie outside the logic model), and thus blocks the opportunity to identify and measure unplanned intervention accomplishments (Birkeland, Murphy-Graham, & Weiss, 2005).

Interventions are traditionally described by their composition of human actors and non-human entities, which are playing pre-defined roles. The integrity of the intervention, to a large extent, requires these people and things to maintain these roles. Our results have shown how technical entities can appear (i.e., student workgroup) or disappear (i.e., take home samples) and how the role taken on by actors (i.e., teachers as co-teachers versus teachers as participants) can translate the techno-gram (i.e., a cooperative learning activity) or disassemble it (i.e. food become objective of trade instead of object of pride to show parents). Evidence from other school health promotion interventions also show that by assigning new roles and introducing new entities, interventions can change relationships, resulting in new and unanticipated roles for these entities (Power, Blom-Hoffman, Clarke, Riley-Tillman, Kelleher, & Manz, 2005; Weston, 2004). In one example (Power et al., 2005), the high utility and popularity of stickers given out to students as rewards for a nutrition intervention overloaded interventionist’s ability to maintain their role as true incentives for the desired behavior. In response, interventionists assigned a new role to students by appointing daily helpers. In another example (Weston, 2004), assessing educational technology implementation, the authors argue that the role of an innovation cannot appear until it is in operation within the classroom. Here, the physical (e.g. access, facilities) and social (teacher collegiality, culture for technology use, classroom management) conditions act as moderators between the role the technology has been assigned and the role it takes on.

## CONCLUSION

This study describes program implementation as a process of translation wherein program implementers strategically assemble connections between social and technical entities. By considering the needs and constraints of students, teachers, and the educational institution in general, nutritionists illustrate an intuitive awareness that the realization of their goals is intimately connected to the ability of the intervention to respond to the goals of the education stakeholders and participants. This study adopts a methodology which does not constrain a program's action into a pre-determined model, thus allowing the identification of new and unanticipated roles for program actors and entities during the 'real world happenings' of program implementation.

Figure 1. Strategies identified by nutritionists to connect interests of participants and stakeholders to the program



**Strategies;****Building alliances with students**

Reinforcing familiar connections with food;  
 - building healthy eating knowledge and know-how

Creating new connections with food;  
 - guiding students towards discovering food in new ways

Expanding students interpersonal connections with food;  
 - highlighting collect success and identities  
 - proving usable and applicable information  
 - sending accomplishments home

**Building alliances with the school**

Connecting nutrition workshop to the teacher's timetable;  
 - providing the nutrition workshop as a pedagogic tool  
 - building a trusting relationship  
 - building professional credibility

Connecting education institution with nutrition education;  
 - responding to new components in the QEP  
 - appealing to educational values which are part of schools  
 - appealing to health values which are part of the school

**Goals;****Students;**

To reduce long term health risk  
 To learn by doing  
 To experience successes  
 To participate in decision making  
 To build autonomy  
 To experience collective achievement  
 To enlarge role in home  
 To demonstrate achievement

**Food;**

To inform about healthy eating  
 To be understood for its complexity  
 To connect people together

**Teachers;**

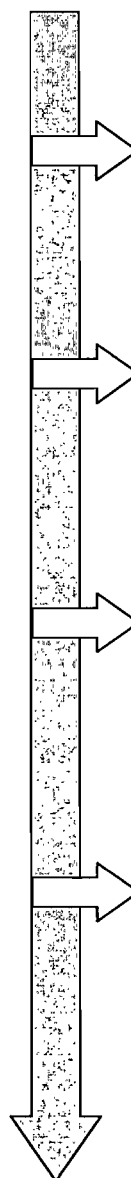
To learn about food and nutrition  
 To complete education program  
 To acquire helpful resources  
 To lighten workload  
 To reinforce professionalism among colleagues

**QEP;**

To be used in its entirety  
 To become validated with evaluations  
 To become validated with projects

**Parents;**

To build positive connections with schools  
 To do more activities with child  
 To build social affiliations

**Nutritionists;**

To connect students to their future health  
 To optimize nutrition workshop functioning  
 To assure the long term stability of the intervention in the school



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**ARTICLE THREE**

Bisset, S., Daniel, M., Potvin, L. The strategic nature of health promotion practice : An exemplary of the interventionists mediating role during program implementation. This paper is in preparation to be submitted to Health Promotion Practice.

## INTRODUCTION

The contextualized nature of health promotion practice has been widely discussed in planning and evaluation models (Green & Kreuter, 1999). Current frameworks reiterate the limitations of intervention research as having paid insufficient attention to how practices translate from one setting to another (Glasgow, Lichtenstein, & Marcus, 2003). In this light, there is a need for “program in context” knowledge (Hawe & Riley, 2005, p. 788) or ‘practice-based evidence’ (Green, 2006) that explicitly addresses local realities and reflects how professional health promotion practices interact with context. While intervention research has revealed many of the facilitators and barriers in organizational contexts (Cho, Zbell, & Nadow, 2004; Payne, Gottfredson, & Gottfredson, 2006; Riley, Taylor, & Elliott, 2001) highlighting the need to adapt plans to local conditions, with some exception (Hawe & Riley, 2005) there has been relatively little incorporation of theory to understand the nature of these adaptive processes. In fact, implementation research seems to suggest that adaptation is limited to a planning ‘phase’ and that once plans have been adapted to improve ‘fit’, the work of practice is simply a function of ‘rolling out’ these plans (Whitelaw, Martin, Kerr, & Wimbush, 2006). The aim of this study is to assess the variation in program practices between implementation settings and to explain these variations according to the theoretical principles advanced by the Actor-Network Theory (Akrich, Callon, & Latour, 2002a; Callon, 1986; Latour, 1987).

We thus present an inquiry into the nature of health promotion practice in response to a current need in intervention research to better understand how practice interacts with context. To this aim, we present a multiple case study of a school-based nutrition intervention focused upon the practices of the nutritionists who implement the intervention in the schools. This case provides an empirical backdrop for our study which seeks to provide theoretical insight into the social processes which explain how programs become implemented into a setting and why programs adapt across settings. By interpreting decisions in terms of what a practitioner encounters in a context, ANT is a suitable framework to build understanding of why and how practitioners adapt programs. Accordingly, the program can be judged in terms of the actions which follow

from these decisions, and not uniquely upon the program 'plan' or 'theory' which is likely to be disjointed from the actual context. Following from ANT, our theoretical proposition posits that the work of adapting programs to context is one of building connections (i.e. practice) and that it is a continuous negotiation and re-assessment of entities whose behavior is often uncertain.

#### Literature Review

Practice, as it relates to health promotion and education, tends to be conceptualized in one of two ways in the program evaluation literature. On the one hand, by espousing values of local engagement and emancipation, health promotion implies that practitioners are in tune with local capacities and in sync with the local values and needs driving people to take action. On the other hand, practice is conceptualized as an extension of scientific knowledge with the logical application of what has been demonstrated to be effective or suspected to 'work' based upon theoretical principles. While the former brings forth the intuitive and interactive nature of practice, the later emphasizes its expert nature, legitimated and valued by scientific knowledge. For researchers who have dealt specifically with the nature of practice, practice is presented as having both these subjective and objective elements. That is, while knowledge in the form of instrumental evidence is an important part of practice, practice is more complex than the application of what is known to be best (Schwandt, 2005). It is in the everyday encounters with specific actors that practitioners decide how and when to draw on such knowledge in combination with their understanding of needs, resources and constraints, and a sense of what it means to be a good practitioner (Schwandt, 2005).

The problematic nature of polarizing practice as either entirely situational and intuitive or standardized and instrumental can be demonstrated with the program evaluation literature in school health. When practice is objectified as a logical extension of what is currently understood to be 'best' or 'evidence-based' the program is represented uniquely through the lens of a program or logic model whereby only the occurrence of pre-planned events tends to be identified as legitimate (Dusenbury, 2005; Dusenbury, Brannigan, Falco, & Hansen, 2003). Evaluation judges practice based upon

the controlled experimental research design, and risks to neglect what makes health promotion in schools effective in the first place. In this respect, it has been argued that high quality practices are more likely to be found in programs that do not easily meet inclusion criteria for systematic reviews as the objects they manipulate and measure respond to negotiations with stakeholders and not rigid research design (Rowling & Jeffreys, 2006). The problematic nature of this approach has been highlighted with anomalous findings from systematic reviews excluding high quality interventions (Bilodeau, Allard, Gendron, & Potvin, 2006).

On the other hand, the evaluation literature has approached practice from a situational and subjective perspective (Greene, 2007; Guba & Lincoln, 1989). While this approach builds on local understanding of the complexities of a setting and guides the incorporation of local particularities and needs into the planning and implementation process (McDonald & Viehbeck, 2007; Nastasi et al., 2000), the information remains specific to the context in which it was derived. Appreciating practice uniquely through a descriptive approach where each situation generates information with application and use only to a specific case is arguably of limited scientific value. Evaluating practice requires the application of a framework upon which program actions and events can be organized where knowledge can be generated from systematic study. Potvin and colleagues (2005) propose integration of social theory as a means by which public health program evaluation can build capacity to theorize 'program-in-use' (Patton, 1997) and thus understand "how an intervention is locally theorized in-situ" (Hawe & Riley, 2005, p. 234).

Program evaluation research has shown that the successful incorporation of health promoting practices into organizations depends upon a shared commitment and interest for health promoting goals along with the capacity to support them (Riley et al., 2001; Scheirer, 1987). Implementation research on school based health promotion confirms that the provision of resources and training from local school districts are important predictors of implementation intensity, and that, within the schools themselves, a shared commitment among direction and personnel which coincides with local program selection is essential for the incorporation of new practices (Cho et al., 2004; Payne et al., 2006). Generating value for health promoting roles into schools has

however been described as a highly challenging endeavor whereby “public health and education systems have different goals, values, and philosophies of practice that may not be easily reconciled” (MacDonald & Green, 2001, p. 763). Despite this, it is possible to integrate health promotion practices in to schools, however what health promoting roles look like in practice may be differ from how they were originally defined or intended by program planners (Cargo, Salsberg, Delormier, Desrosiers, & Macaulay, 2006).

Accordingly, there is a need for knowledge to reveal how programs are actually being practiced; that is, how the various actors interpret or translate their roles to affirm their own identity interactively with others who, with them, define the social context of the setting. Researchers in school health have called for an approach whereby health promotion practices can be evaluated in a manner which legitimates the process of negotiation and the incorporation of stakeholder needs and values (Kam, Greenberg, & Walls, 2003; Rowling & Jeffreys, 2006). This approach has also been identified as a solution which responds to the longstanding ‘fidelity and fit tension’ associated with program implementation evaluation (Blakely et al., 1987; Castro, Marrera, & Martinez, 2004). In this respect, local adaptation of “culturally mismatched” (Castro et al., 2004, p. 42) program practices has been suggested as improving adoption through enhanced local ownership which sustains motivation and participation.

### School Context

#### 1) The Intervention : Nutrition intervention *Petits cuistots - parents en réseaux*

The school-based nutrition intervention *Petits cuistots - parents en réseaux* (translated as *Little Cooks – Parental Networks*) (hereafter referred to as PC-PR) provides the case for this study. First implemented in 1998, the PC-PR program aims to promote healthy eating behaviors through the bias of food preparation capacity and nutrition knowledge, parental participation and citizenship building among young school children and their families. In 2005, PC-PR was implemented in 8 Montreal schools serving the top 20% of disadvantaged primary school aged children living in Montreal (Anonymous, 2007).



The *Little Cooks* component includes teacher and parent assisted monthly nutrition workshops, created and animated by six nutritionists. Eight, ninety minute workshops are planned for each academic year. Workshops feature rotating themes, which expose students to new or alternative foods, ecological issues, international cuisine, food types and health issues. Each workshop includes; 1) didactic knowledge transmission on topics such as food transformation, food types, nutrition and health; 2) hands-on recipe completion using a cooperative learning approach; and 3) tasting of the finished recipe with samples to be taken home. In-class preparatory exercises are proposed to teachers in order to increase the student's level of motivation and implication during the workshop. The second component (*Parental Networks*) is organized by community development workers and aims to support the development of mutual support networks through parents' active involvement in the school. This case study focuses upon the *Little Cooks* classroom-based nutrition workshops.

## 2) Quebec Education Program

The Preschool and Elementary Quebec Education Program (QEP) underwent an important reformulation during the last part of the 20<sup>th</sup> century. Documentation on this subject can be accessed through the Quebec Minister of Education website at ([www.mels.gouv.qc.ca/dfgj/dp/programme\\_de\\_formation/primaire/educprg2001h.htm](http://www.mels.gouv.qc.ca/dfgj/dp/programme_de_formation/primaire/educprg2001h.htm)). The new QEP or 'reform' is identified as a response to recent socio-cultural trends, including: internationalization, globalization, information explosion, rapid technological development and the growing complexity of social life. In response to these new technical and social demands, the QEP identifies the need to build competencies which go beyond core areas of learning. That is, beyond the subject specific focus of the educational program, the reform identifies two new areas of concentration, cross curricular competencies and broad areas of learning. Cross-curricular competencies are generic in nature and refer to intellectual, methodological, personal and social and communication-related competencies used in various subject areas. Broad areas of learning aim to bridge the boundaries between the multiple realities of the child, including the school, home and community. Broad areas of learning aim to enable students to look critically at their personal, social and cultural environment.

### Theoretical Framework : Actor-Network Theory

The Actor-Network Theory (ANT) studies the formation of technology or innovation with the socio-technical network conceptual framework (Akrich et al., 2002a). Here, innovation is defined as an idea, project, plan or prototype which has met the judgment of a potential user system (Akrich et al., 2002a). As the name implies, the socio-technical network is a figurative device which captures the 'work' required to connect groupings of social (i.e. human) and technical (i.e. non-human) entities together. This form of analysis is often used as a method to explain the success or failure of innovation or of an organization's capacity to be innovative (Akrich et al., 2002a; Akrich, Callon, & Latour, 2002b). Premised upon the health promotion program as a type of health technology (Lehoux, 2006) ANT was identified as an appropriate framework to understand how, through practice, the program interventionists (i.e. nutritionists) translate the program according to the conditions which are unique to each school.

The success and failure of innovation is explained by ANT in terms of the actor's ability to enroll a network of alliances, where an 'enrolled alliance' is a human or non-human entity that behaves in a manner which supports the innovation, thus building stable connections. In other words, the more there are enrolled alliances in a school or the more the nutrition intervention is characterized by stable connections, the more the intervention has integrated into a school. According to ANT these connections are built through acts of translations, where translation is a result of the continuous negotiations among the entities who may become, or who are already part of the network. In terms of program implementation, the 'work' of negotiation is continuous because conditions differ across settings and are constantly changing within the same setting.

In ANT terminology, potential allies (or entities) are in constant movement and are rarely going to behave entirely as expected. The uncertainty with which networks are built through connections with entities is captured by two contrasting concepts; 'mediators' and 'intermediaries'. In the vocabulary of Latour (Latour, 2005) an intermediary functions as one and does not transform or distort meaning, it behaves as

expected, whereas a mediator is just the opposite, it changes meanings and behaves in ways which may be unexpected and unpredictable. The nature of an entity as a mediator or an intermediary is what makes building connections and the behavior of a network uncertain. Due to the high degree of uncertainty which is associated with enrolling entities who are largely unfamiliar, nutritionists are continually working out how they can enroll them as allies, where the strategies applied in one context are not necessarily going to work in another. An example of a mediator would be the classroom where the workshop is taking place or the food sample which is to be taken home. While seemingly simple, the classroom could be quite complex depending upon the what is in the classroom (e.g. sink), where it is located, its layout, and whether the room is shared with other school programs. A take home food sample could likewise take on different meanings, from being an item which is exchanged between students, to one which may or may not be recognized and tasted by the child's family.

## METHODS

### Sample

A total of seven out of the eight participating schools were included in this study. The excluded school did not contain grade levels targeted for this study (Grade 4 and 5). During the 2004/05 school year the program was implemented in kindergarten through grade five classrooms, which included a total of 113 classrooms and 2156 students. A total of 19 grades 4 and 5 classes were sampled. The sample represented 31 out of the 133 workshops which took place during the study year in the sampled classes (i.e. 7 workshops per class). Due to sudden and unexpected budget constraints the 8<sup>th</sup> workshop was not given during the year of the study. The sampled workshops are those which occurred at the end of the academic year.

### Study Design

We present a multiple case study of the PC-PR intervention based upon the nutritionists practices as they varied across the schools. Cases are thus the seven schools and units of analysis are the 31 nutrition workshops. With one exception, each nutritionist performed nutrition workshops within one of the seven schools. Practices as

they refer to a workshop thus relate uniquely to the conditions of one school and to the characteristics of one nutritionist. This multiple case study is used to reveal the strategic nature of practice as a continuous negotiation and re-assessment of entities whose behavior as mediators or intermediaries is often uncertain.

### Data Collection

Data collection included semi-directive standard interviews with each of the six nutritionists, in addition to observation and audio-recordings from the classroom-based nutrition workshops. Consent was obtained from the participants for interviews (i.e. nutritionists), observations and audio-recordings (i.e. nutritionist and teachers). Institutional review board approval was provided by the University of Montreal Faculty of Medicine's Ethical Research Review Committee.

Interviews were completed to identify the general over-riding strategies used by the nutritionists to implement the program. Interviews queried nutritionists' interpretation of the underlying premises of the program, along with their interactions with school personnel, students, parents and other school interventionists. Nutritionists responded to questions regarding if and how these interactions may have influenced their actions and their expectations regarding program operations and potential outcomes. Interviews lasted from sixty to ninety minutes. Interviews were recorded and transcribed verbatim.

Workshop observations and audio-recordings followed the nutritionists practices during the delivery of classroom-based nutrition workshop as well as during workshop set up and clean up (i.e. prior to the arrival of the class and after their departure). Observational notes recorded the facilities and general layout of the tools (i.e. placement of food items, utensils, tables and chairs) and the impressions and intentions of the nutritionist along with the general behavior of the students, teachers and participating parents. Audio-recordings were obtained through a dictation device worn by the nutritionist during the entire duration of the workshop.

### Data analysis

Data analysis began with the nutritionist interviews. The analytic procedures and results are detailed in another study (Bisset, Daniel, Potvin, in preparation). Very briefly, following a coding scheme inspired the Actor-Network Theory (ANT) in general and an empirical application of this theory in particular (Callon, 1986) nutritionists' discourse was coded for instances where; 1) she described human and non-human entities in terms of specific identities and goals and; 2) the strategies she used to interest these entities in the nutrition intervention. From this, nutritionists representations of the specific identities, goals and strategies were compared and contrasted between schools. Data analysis thus began by identifying how nutritionists defined the school context in terms of the entities' goals and identities, and the 'translation strategies' nutritionists employed to integrate the program into the school according to these definitions. 'Translation strategies' can thus be understood as representations of the school context and of the negotiations which developed as this context became defined.

Data analysis continued with the observation notes and audio-recordings to identify nutritionists practices as observed and/or recorded during the nutrition workshop. Each nutritionist was located in just one school. For example, nutritionist 'A' implemented the program only in school 'A', nutritionists 'B', uniquely in school 'B', and so on. One exception was with nutritionist 'F' who implemented the workshop among grades 4 and 5 classes in two schools. To distinguish the practices as they occurred within these different schools, this nutritionists is referred to as nutritionist 'F-i' and 'F-ii', where 'i' and 'ii' refer to two different schools.

The workshop audio-recordings were first deductively analyzed for the presence of practices which corresponded to the operation of the over-arching strategies as identified from the interview analysis. Operational definitions of these strategies as derived from this empirical analysis are found in Table One. The 'coding' of workshops for practices which correspond to the operational definitions progressed across all workshops, one workshop component at a time. The resulting list of 'descriptive codes' was reduced and refined into one 'master' list which served as a template to systematically code workshops for the occurrence of specific practices, allowing the practices between workshops to be comparable. Table Two provides some examples of

the 'descriptive codes' identifying practices during the food preparation and theoretical components of the workshop. Observed practices were thus understood to support the occurrence of nutritionists strategies to build alliances with the students and the school.

The practices were next organized into an analytic grid according to; 1) the school (A through F-ii); 2) workshop component and; 3) the over-arching translation strategy. More precisely the purpose of the analytic grid was to; 1) identify nutritionists practices as they occurred in a particular school during the operation of the nutrition workshop; 2) relate these practices to an overarching strategy; 3) to determine if and how nutritionists variously implemented strategies which privileged the formation of some connections over others and; 4) to relate this variation to the conditions in the school. Once the analytic grid was completed the number of practices for each strategy were counted in order to compare nutritionists' implementation practices whereby variation was expected to reveal a differential emphasis between nutritionists upon the formation of some translation strategies over others.

#### Validation Procedures

The credibility of the study findings is first and foremost rooted within the articulation between the aims of the research, empirical data and theoretical orientations. The empirical proposition which guided the collection and analysis of this data was specified *a priori* and derived from the ANT theoretical framework. The trustworthiness of the interpretations which were gleaned from the data developed through ongoing informal member checking with program practitioners and also through peer debriefing with colleagues who were also in the process of integrating social theory into their qualitative research endeavors. Field logs were also used to keep a general record of how nutritionists representations of the program became translated into practice during the delivery of the nutrition workshop. Results derived from the audio-recordings were not validated for reliability, however the analytic procedures and results are traceable through a series of templates and an analytic grid.

## RESULTS

All nutritionists implemented strategies to build alliances which included; building familiar connections with food (i.e. building healthy eating knowledge and know-how) creating new connections with food (i.e. discovery, self-achievement) and expanding interpersonal connections (i.e. cohesiveness among students and connections to family). Differences were found between schools regarding the emphasis nutritionists placed upon the implementation of these strategies. Some but not all nutritionists implemented strategies during the nutrition workshop which were aimed at connecting the nutrition workshop into the teachers timetable and connecting the educational institution with nutrition education. Variation between strategies was described by the degree to which human (i.e. students, teachers, parents) and non-human (i.e. education reform components) entities were allotted (and/or assumed) their place amongst the operations of the nutrition workshop. Findings reveal some of this variation to be accounted for by the structural and social conditions in the school, the individual preferences and past experience of the nutritionist.

Overall, a total of 33, 30 and 31 practices were found, respectively to confirm the occurrence of strategies aimed at building familiar connections with food, creating new connections with food and expanding interpersonal connections. In all 6 practices were found to confirm that nutritionists were building alliances with the school during the nutrition workshop. Practices varied between schools in terms of the emphasis nutritionists place upon building these connections (Table 3). Practices in schools A and F-ii emphasized building familiar connections with food, practices in schools C and F-ii emphasized creating new connections with food, and practices in schools B, E and D emphasized building interpersonal connections. Practices in schools C, D, and E revealed the presence of strategies during the workshop to build alliances with the educational institution.

#### *Variation in the overall structure of the nutrition workshop*

The average duration of the workshop was one hour thirteen minutes (1h 13 min). Within school averages ranged from fifty eight minutes (58 min) to one hour twenty-three minutes (1h 23 min). Important differences were found in the variation in workshop duration, where variation was relatively small in some schools (A,B,C) (no

more than  $\pm 5$  minutes), but quite large in others (at least 15 minutes) (D,E,F-i,F-ii). Space availability also differed between schools, where some provided a classroom for the nutritionists exclusive use (A,B,C,D), whereas others required the nutritionist to share a room with another program (F-i,F-ii) or with the staff of the school (E). (Table 4)

The sequence and duration of these workshop components differed between schools. While nutritionists in some schools (A,B) consistently began the workshop with the lesson plan, and allotted it more time (average 28 and 26 minutes respectively), others (C,D,E,F-i and F-ii) ended the workshop with the lesson plan and shortened its duration (respectively 19, 10, 13,10,13 minutes on average). Leaving the lesson plan to the end of the workshop increased the likelihood that it would be given during the time students tasted their recipe (C,D,E,F-i) or that it would not be delivered at all (E,F-i). (Table 4)

#### *Variation in the social context of schools*

The social context of the school is described by the goals and identities nutritionists attributed to the school entities (i.e. educational direction, teachers and Quebec Education Program) as well as to the identity she attributed to herself (Table 5). Namely, by describing the goals and identities of human and non-human entities of the school, nutritionists identified the context of the school as interacting with the program. Similarly, by associating these interactions with her own qualities, nutritionists practices also have a relationship with her perceived role in the school, as animator of the nutrition workshop and her distinctiveness among other nutritionists in the program team.

Some of these interactions between nutritionists identity and the social context of the school were revealed by the practices observed during the nutrition workshop. Most notably was the relationship found between the (in)consistency of the workshop structure and the nutritionist's representation of her legitimacy (or lack of) in the school. Nutritionists whose workshops had a stable between classroom duration, where variation did not pass five minutes were also those who represented their role as legitimate in the school (A,B,C). On the other hand, nutritionists whose workshop



duration could vary from one workshop to the next were more likely to question their legitimacy (D,E,F-i,F-ii). School facilities in terms of the classroom were also associated with the nutritionists' legitimacy. Namely, while the majority of nutritionists were provided with a classroom for their exclusive use (A,B,C,D), the nutritionists who questioned their legitimate role in the school were more likely to be those who shared a room with another program (F-i,F-ii) or with the staff of the school (E).

The representation nutritionists had of their legitimacy was formed through the nutritionists' current and past experiences with teachers and school administration. Legitimacy was identified among nutritionists by their *professional credibility among teachers* and their *sense of being integrated in the school*. Nutritionists (D,E,F-i,F-ii) recognized a lack of legitimacy particularly with teachers who identified the workshop as *time taken away from regular curricular activity* or as *"just a cooking class"*. The identification of an unstable role in the school could also be informed by past experiences;

*" I think that you should never take it for granted. Having personally lived this, at one moment, everything changes and you are no longer integrated, even worse, you can be put completely on the side "*

- Nutritionist D

Additionally, lacking a comfortable relationship with school administration whereby the school director's *demeanor was perceived as unapproachable*, negatively influenced the nutritionist's perceived legitimacy in the school (F-ii), whereas sensing that the school direction was *supporting the program* contributed positively to perceived legitimacy (C). Positive interactions with school personnel contributed a sense of belonging;

*" ...I feel very much, now, in the school. I don't feel, you know, my salary isn't from the CSDM (Montreal school board) but I feel like an employee of the CSDM "*

- Nutritionist C

*Transforming practices to build alliances with the school*

Compromised legitimacy combined with explicit disinterest on the part of teachers and students created transformative conditions, whereby one nutritionist with relevant past experience was ready and willing to make adjustments;

*“...you must be open and ready to always take advantage of the occasions which present themselves, to really see how you can evolve.”*

- Nutritionist D

Here, disinterest among educational stakeholders had been communicated to a nutritionist through the school direction who spoke on behalf of both teachers' and students' boredom with the program (i.e. a “babyish” approach). Two conditions within the school permitted this controversy to result in a transformation with the functioning of the nutrition workshop (i.e. a de-emphasis placed upon reinforcing familiar connections with food and an emphasis placed upon expanding interpersonal connections between students). First, the nutritionist felt comfortable with her relationship with the school direction whereby the school direction's *demeanor was perceived as approachable* and who was *perceived to be a trusted spokesperson for school personnel*. Second, the school *had resources available* which could be shared with the nutritionist in the form of a pedagogic expertise, and for whom, the nutrition workshop *had value for educational interests*. The pedagogic expert found interest in the program with respect to its potential to respond to a current pre-occupation among education stakeholders to implement activities in the schools which *responded to the newer competencies within the Quebec Education Program's (QEP) reform*.

Transformations thus occurred within certain nutrition workshops in order to engage the interest of teachers by incorporating the QEP into the workshop operations. Most notably, the workshop was transformed into a context which responded to teacher's need to create the conditions where students could work in cooperation and where they could evaluate students' social learning competencies. In this light, the nutrition workshop became an opportunity for teachers to respond to professional requirements. Although the nutrition workshop still involved food and cooking

procedures, the emphasis was placed more upon the workgroup method as a means to develop social competences than upon the acquisition of cooking skills. Consequently, the emphasis upon the technical meaning of food was refocused upon the experiential meaning of food, which highlighted the collective autonomy of students, their co-dependence and need for trial and error.

This transformation co-occurred with the nutritionists' perceived lack of legitimacy and low teacher engagement with the nutrition workshop. However, these were necessary but not sufficient conditions for such a transformation to occur. A minimum engagement of the part of the school personnel to experiment with new practices was necessary in order for the nutrition to implement this kind of change. Additionally, a nutritionist experiencing 'ideal' school conditions (i.e. representations of credibility and integration, regular and stable workshop duration, appropriate facilities) incorporated these new practices based upon the need or enjoyment for experimentation.

#### *Transforming practices to build alliances with students*

In addition to responding to educational interests, nutritionists' practices were also formed according to their representations of students needs, and how, by responding to these needs, their own health promotion goals could be realized. In particular, some nutritionists privileged practices that facilitated and/or obliged students to assume an active and contributory role during the workshop, whereby students' involvement in creating their own successful school experiences was identified as a means to promote health. By deemphasizing the technical meaning of food (i.e. familiar connections with food) and emphasizing the explorative and experiential value of food (i.e. new connections with food) nutritionists aimed to influence students to assume roles with more autonomy and influence on the form of shared knowledge about food. In this respect students became active in the formation of their own connections with food.

As illustrated by this quotation, for some nutritionists, capturing interest in food went beyond healthy eating knowledge and know-how;

*“Health, this is not my goal. I realize that my goal, it is the children. Finally, with this, with this way of functioning, we touch social development, the personal development of the child, a lot, there, (with) the collaboration, it is really the character of each (child), this comes out...some are too leader, so are too shy, it comes out ... we work on this. This is not nutrition, it isn't.”*

- Nutritionist D

However, even when nutritionists identified this goal in their discourse, implementing practices to build new connections between students and food were favored in certain classroom conditions. Classes whose behavior was characterized by interrupting, talking out of turn or conversing on unrelated topics interfered with the ability of the nutritionist to explore the meaning of food with students. While certainly this behavior occurred at times in all workshops, some teachers were found to be more pro-active in reminding students of their noise levels or to stay focused on the activity. Where nutritionists were in the obligation to remind students to be quiet, their engagement with the workshop became compromised whereby they included less detail, asked fewer questions and may have cut out workshop components all together.

In addition to student behavior, the teacher’s engagement during the workshop could also impact nutritionists practices to build new connections between students and food. Some nutritionists (F, E) described their animation as more lively when they sensed a certain degree of ‘co-teaching’ with teachers, and thus as being particularly sensitive teacher input. Thus, in there circumstances where nutritionists enjoyed teacher input and where teachers wanted to learn about diet and nutrition, practices to create new connections with food were particularly high.

Variation between nutritionists was found with respect to the practices they implemented to enhance student autonomy during the food preparation activity. Here some nutritionists facilitated the completion of the recipe for students while others introduced challenge and asked students to problem solve amongst themselves through difficulties. Most notably some nutritionists (D,E,F-ii) set up tools and ingredients purposefully (i.e. separated from the workgroup tables) where others (A,B,C) placed the

required tools and food items in the centre of the workgroup tables. Separating food and tools from the worktables, shifted the rhythm of the workshop from one which was controlled and synchronized to one which was less predictive and chaotic. In classes where behavior was appropriate, nutritionists would also be likely to congratulate workgroups on their work methods and introduced a new workshop component (i.e. ‘a return’ upon the food preparation) which involved students in a positive discussion of their experience (D,E).

Prioritizing the food preparation component of the workshop compromised the establishment of other connections between students and food, particularly those based upon the dissemination of knowledge (i.e. familiar connections with food). Time restrictions resulted in the delivery of “*the essential messages*” (Nutritionist D) and by combining the delivery of the lesson with the tasting experience, students would sit and listen without making commentaries, asking or responding to questions. In addition, delivering the lesson during the tasting component of the workshop compromised opportunities to build new connections between students and food (e.g. personal preferences and tasting experiences).

Variation between nutritionists’ practices during the lesson to engage students as active participants was particularly well articulated between two Nutritionists (A,B). Nutritionists A and B both devoted similar priority to the lesson (i.e. consistently beginning the workshop with the lesson plan), however, nutritionist B applied a strategy to interest students in food by involving them in the formation of the knowledge during the lesson;

*“During the theory, in place of saying it, I ask many questions, and you know, I go from what they (the students) tell me. It is sure that the theory is passed, but, you know, it isn’t necessary exactly the same, or in the same order. It goes really from what they tell me and what they ask me”*

- Nutritionist B

Leaving space for student’s questions and comments resulted in the appearance of new topics, such as vegetarianism, population consumption trends, and the nutritive versus

monetary value of food, and also permitted opportunities for students to be queried upon and share their family food customs and practices. In contrast while Nutritionist (A) asked students questions and paused while they advanced themselves through commentaries and responses toward valid responses, their commentaries rarely took on the form of questions, and their responses did not inform the nutritionists follow-up discourse. This nutritionist represented her practices as approaching a certain level of mastery with knowledge delivery.

## DISCUSSION

Our study shows that the practices implemented by program interventionists followed from the interpretations they held regarding how their actions could effectively engage the actors from a setting with health promotion goals. Additionally, we provide some demonstration that interpretations varied between interventionists according to the school context, their individual preferences and past experiences. This finding contributes to a growing body of knowledge identifying the program-context interface as a dynamic space characterized by negotiation and compromise, resulting in transformations in programs. This study further contributes to evidence challenging a conceptualization of practice which is uniquely viewed relative to best practice recommendations and as purely an instrument to apply evidenced based knowledge. Our results found subtle differences in the attribution of roles between settings which had consequences upon the practices which were implemented. In this respect, interventionists are not simply intermediates or 'instrumental objects' conforming to program models but rather are actively revising plans in accordance with their interpretations of how stakeholders and participants can become (or be maintained) engaged with program goals.

Nutritionists were found to vary in their perceived legitimacy in the school. These perceptions corresponded with objective measures related to workshop duration and the completeness with which the program components were delivered. Measures of this nature (i.e. dose and adherence) are commonly used to determine the degree to which practices comply to program intentions (i.e. implementation fidelity or integrity)

(Dusenbury, 2005). While low fidelity and poor sustainability are oft cited challenges to school-based health promotion, the underlying mechanisms which explain these challenges are given limited attention. One group of researchers has proposed a model to predict implementation fidelity over time to reveal eight general measures of school capacity including a wide range of factors such as resources, leadership and compatibility (Gingiss, Roberts-Gray, & Boerm, 2006). Alternatively, another group has found the quality of inter-personal relationships which positively relate to adaptability to change to predict fidelity to program implementation over time (Gregory, Henry, & Schoeny, 2007; Parcel et al., 2003).

Our results suggest following the actions of the *primum movens* (i.e. the actors responsible for implementing a program) as a means to identify the impeding social and structural conditions in the school, and further, and more usefully, to identify the interplay between these contextual conditions and the program. Namely, our results show that nutritionists were aware of the program's receptivity in the school based upon their perceived legitimacy. Further, consequent to these perceptions, nutritionists engaged in a transformative process in order to build interest among the stakeholders in the school. This finding shows, along with others, that practitioners develop strategic actions to reconcile the activities they were mandated to implement in the school with the demands or needs which are implicitly or explicitly communicated to them from the schools (MacDonald & Green, 2001). Empirical results in this respect correspond to educational theories of change with regard to the adoption of innovation. Theories of social influence show how practitioners would intuitively adjust their practices following the rule of reciprocity or 'give and take' (Cowell et al., 2005). Namely, practitioners who sense that educational stakeholders are providing them with time which has been taken away from other curricular activity, devise a means to 'repay' them with a valued commodity (i.e. incorporating educational material into workshop).

Nutritionists were also found to make various translations in the form of the nutrition workshop. Translations ranged from small changes in the place or role that students or teacher were given or expected to take to inform knowledge dissemination during the lesson plan, to important changes to the functioning and focus of the food preparation activity. While nutritionists for whom obtaining legitimacy was a challenge

were more likely to embark on transformations, other nutritionists also were found to make similar changes. Our results then suggest that interventionists will translate planned activities in response to conditions which are endogenous to a setting and also according to their own values, preferences, goals or experiences. This highlights the interpretive nature of practice and supports literature which poses challenges to expectations that practice will conform to evidence derived from systematic controlled empirical examination (Cowell et al., 2005; McDonald & Viehbeck, 2007). At the same time, results show that practice is not spontaneous or ‘whimsical’ but rather a strategic process of negotiation where risks and benefits of making translations are carefully weighed in what has been referred to as a “dilemma of moderation vs. stringency” to implement program objectives (Cargo et al., 2006, p. 93).

The strength of these findings should consider the quality of the data and the validity of the analysts’ interpretations. Due to unexpected and sudden budget cuts, the final nutrition workshop was cut, impacting the planned sampling of workshop observations. This posed important limitations upon the amount of data which could be collected in this regard. The limited number of workshop observations and the range of within school observations between the nutritionists may have compromised the quality of the data to fairly represent each nutritionist. However, audio-recordings together with participant observations did allow the collection in independent measures of practices during the nutritionist workshops, and interviews with nutritionists also served as sources upon which the quality of data was improved. These unexpected constraints also placed limitations upon opportunities to return and confirm analytic interpretations with the participants. However, informal observations (i.e. without audio-recordings) together with field experience with the community organization where nutritionists met to discuss and plan the workshops and their experiences in the schools lasted the entire academic year. This prolonged engagement with the setting and the relevant actors contributed to the quality of data and validity of data analysis. Further, it is likely that observations captured only a partial view of the transformative practices which occurred during the entity of the academic year.

Observer bias is also well known to be problematic with evaluations of this nature where behaviors of observed actors change in evaluative conditions (Miles &



Huberman, 1994; Patton, 2002). There is no way of ruling out that this bias informed findings. However, as an independent evaluator with no association with the funding agencies, the independence of the researcher in this respect was identified, and it is unlikely that nutritionists perceived the evaluators role as threatening. Further, a certain level of familiarity developed over time between the nutritionists and the researcher who (also trained in nutrition) assisted both prior to and following workshops with set up and clean up duties. However, the practices of the teachers are likely to have adjusted with the presence of the evaluator. In this respect, classroom management and expressed enthusiasm for the program may have been exaggerated (in either direction) due to my presence during the workshops.

### Conclusions and Implications

The development of an evidence base which legitimates the interpretive and strategic nature of practice has important implications for health promotion practice in general, and school-based health promotion in particular. While health practitioners such as nutritionists have typically followed individually-based behavior change theory the need to extend action beyond the classroom to “help create conditions that facilitate more healthful individual choice and more supportive social and physical environments” (Lytle, 2005, p. 92) has been acknowledged. This requires health professionals to engage in relationship building activities in ways which are less centered upon passing health promotion messages and building individual skills, than upon negotiating and compromising their own goals in relation to those of others.

In this light, the practice of implementing a health promotion program is not simply instrumental, rather the role of the practitioner is less concerned with transmitting the objectives from a health promotion program into a setting than it is about translating program objectives to the needs of the actors living, learning or working in that setting. While the results of this study are modest in confirming this interpretive role of practitioners, they are nonetheless important in that they challenge current implementation frameworks based upon integrity to account for this dimension of practice. An implementation framework which guides evaluation to identify the

rationality of practice and follow the program practices as strategic actions is thus proposed in response to this need to account for the dynamic reality of program implementation.

Table 1. Definition of practices to build alliances with students and school

Building Alliances with students;
<p>Reinforcing familiar connections with food;</p> <ul style="list-style-type: none"> <li>- <i>defined by nutritionists actions to build healthy eating knowledge and know-how by referring to the nutritional value of food (i.e. quantity or quality) or the technical meaning of food (i.e. an instructional or manipulation tool)</i></li> </ul>
<p>Creating new connections with food;</p> <ul style="list-style-type: none"> <li>- <i>defined by nutritionists actions to guide students toward discovery of the diverse meanings of food (social, ecological, industrial, or commercial) and its potential to build their sense of self-identity and achievement.</i></li> </ul>
<p>Expanding interpersonal connections</p> <ul style="list-style-type: none"> <li>- <i>defined by nutritionists actions to support students role acquisition among classmates and/or family</i></li> </ul>
Building Alliances with school;
<p>Connecting the nutrition workshop into the teachers timetable</p> <ul style="list-style-type: none"> <li>- <i>defined by the actions taken by the nutritionist to engage the teacher</i></li> </ul>
<p>Connecting the educational institution with nutrition education</p> <ul style="list-style-type: none"> <li>- <i>defined by the actions taken by the nutritionist which suggest that the nutrition workshop is used as a unique and essential part of the educational curriculum; In this respect, the workshop responds to the explicit needs of the school to build social competencies among students, partnerships with parents and a health education curriculum.</i></li> </ul>

Table 2. Examples of practices in response to the strategies employed by nutritionist to build alliances with students and school

Reinforcing familiar connections with food	Creating new connections with food	Expanding interpersonal connections
<b>Workshop component : Food Preparation</b>		
<p>Directs students through the proper interpretation of recipe;</p> <ul style="list-style-type: none"> <li>- Responds to question (measurement, procedure, manipulation) providing direct answer</li> <li>- Redirects students through a procedure by interrupting or by asking a question</li> </ul> <p>Modifies or correct a manipulation procedure</p> <ul style="list-style-type: none"> <li>- showing how to do or how to do better</li> </ul> <p>Directs students to complete food preparation</p> <ul style="list-style-type: none"> <li>- Tells students to get on to the next step, what to do next, to put things away, to sit down, to clean tables, to wait</li> </ul> <p>Facilitates the completion of the food preparation</p> <ul style="list-style-type: none"> <li>- placing food items and tools directly on workgroup table</li> <li>- pre-preparing food items</li> <li>- removing a procedure</li> </ul>	<p>Enlarges the space for recipe completion beyond immediate work tables to other places within the classroom</p> <p>Provides a new food fact</p> <p>Involves students in finding solutions;</p> <ul style="list-style-type: none"> <li>- Responds to question by referring student back to recipe</li> <li>- Refers students to a new smell, texture, taste</li> <li>- Tells students that errors are ok because they are learning</li> </ul>	<p>Involves students in finding solutions;</p> <ul style="list-style-type: none"> <li>- responds by referring question to students</li> </ul> <p>Talks about working together, sharing, taking turns, cooperation</p> <p>Reminds about roles &amp; responsibilities</p> <ul style="list-style-type: none"> <li>- asks students if they are respecting their role</li> <li>- corrects student behaviour based upon their role</li> <li>- asks students to remind one another of their roles</li> </ul> <p>Reminds about autonomy</p> <ul style="list-style-type: none"> <li>-refuses to respond to question</li> </ul> <p>Refers positively to workgroup functioning</p> <p>Providing Usable and applicable information;</p> <ul style="list-style-type: none"> <li>-identifies possible adaptations and alterations which can be tried at home</li> </ul>
<b>Workshop component : Lesson (Theory)</b>		
<p>Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre</p> <p>Identifies nutritional composition of food in terms of; nutrient quantities</p> <p>Relates nutritional value in food to health effects on body; names diseases</p> <p>Identifies nutritional composition of food in terms of Canadian Food Guide</p> <p>Relates the food to common consumption practices</p> <p>Relates the food to individual students' consumption practices</p> <p>Situates the food in terms of cookery – recipes</p>	<p>Relates the food to alternative dietary practices– religion, culture, vegetarianism</p> <p>Relates the food to its use in language and tradition</p> <p>Discusses the sensory experience associated with the food – taste, smell</p> <p>Discusses the food in terms of its plant biology – cultivation, classifications</p> <p>Discusses food in terms of world geography and climate</p> <p>Discusses the food as an consumer product – corporation, marketing strategies</p> <p>Discusses the food in terms of its manufacture – as an industrial product</p>	<p>Involves students by discussing prepared exercise</p> <p>Involves students by asking questions and waiting for their response</p> <p>Uses students responses, commentaries and questions in content of lesson</p> <p>Involves students personal experiences and cultural traditions</p>

Table 3. Number of practices observed between schools confirming operation of strategies to build alliances with students and schools

	School A	School B	School C	School D	School E	School F-i	School F-ii
Reinforcing familiar connections with food	<b>Const.*</b> <b>10</b> <b>Var.*</b> <b>3.</b>	Const. 5 Var. 4.	Const. 10 Var. 5	Const. 4 Var. 2	Const. 6 Var. 8	Const. 10 Var. 5	<b>Const.</b> <b>8</b> <b>Var.</b> <b>5</b>
Creating new connections with food	Const. 8 Var. 7	Const. 9 Var. 12	<b>Const.</b> <b>14</b> <b>Var.</b> <b>11</b>	Const. 6 Var. 6	Const. 7 Var. 9	<b>Const.</b> <b>15</b> <b>Var.</b> <b>5</b>	Const. 1 Var. 9
Expanding interpersonal connections	Const. 6 Var. 1	<b>Const.</b> <b>10</b> <b>Var.</b> <b>1</b>	Const. 8 Var. 3	<b>Const.</b> <b>13</b> <b>Var.</b> <b>2</b>	<b>Const.</b> <b>16</b> <b>Var.</b> <b>2</b>	Const. 3 Var. 8	Const. 4 Var. 5
Connecting the nutrition workshop into the teachers timetable	Const. 0 Var. 0	Const. 0 Var. 0	Const. 2 Var. 0	Const. 0 Var. 0	Const. 1 Var. 1	Const. 0 Var. 1	Const. 0 Var. 0
Connecting the educational institution with nutrition education	Const. 1 Var. 0	Const. 0 Var. 0	<b>Const.</b> <b>2</b> <b>Var.</b> <b>0</b>	<b>Const.</b> <b>2</b> <b>Var.</b> <b>0</b>	<b>Const.</b> <b>3</b> <b>Var.</b> <b>0</b>	Const. 0 Var. 0	Const. 1 Var. 1

Consistently Observed (Const.) between the workshops within the same school

Variously observed (Var.) between the workshops within the same school

Table 4. Between school variation in structural characteristics of workshop

	School A	School B	School C	School D	School E	School F-i	School F-ii
Average duration (var)	75 min (+/- 3)	70 min (+/- 4)	80 min (+/- 5)	75 min (+/- 20)	70 min (+/- 15)	58 min (+/- 20)	85 min (+/- 15)
Space availability	exclusive use of classroom	exclusive use of classroom	exclusive use of classroom	exclusive use of classroom	Shares room with school staff	Shares room with other program	Shares room with other program
Ordering of workshop components	Consistently the same order	Consistently the same order	Order may vary between workshops	Order may vary between workshops	Order may vary between workshops	Order may vary between workshops	Order may vary between workshops
Ordering and duration of workshop components (inter-workshop range)	Theory 25 (21-29) Game 7 (5-14) Instruction 2.6 (1-4) Practice 29 (22-38) Tasting 8 (5-12)	Theory 26 (17-35) Game n/a (0-8) Instruction 5 (2-12) Practice 26 (25-27) Tasting 9 (7-12)	Instruction 8 (4-12) Practice 40 (35-45) Theory 19 (13-25) Game n/a (0-6) Tasting 8 (5-12)	Instruction 10 (8-12) Practice 41 (41-42) Game n/a (0-10) 5. Tasting & Theory 12 (10-14)	Instruction 8 (4-14) Practice 39 (22-52) Return 2 (1-3) Theory 13 (6-16) Game n/a (0-11) Tasting 9 (5-15)	Instruction 13 (6-19) Practice 32 (20-46) Theory n/a (0-15) Tasting (&Theory) 10 (6-15)	Instruction 7 (5-13) Practice 43 (37-48) Return n/a (0-3) Theory 13 (8-19) Tasting 8 (5-10)

Table 5. Social conditions across schools

School A	<p>ED Director is identified as a legitimate spokesperson for teachers.  ED Dir makes decision regarding presence of program in school.  ED Direct wants to implement health curriculum.</p> <p>Teachers are pre-occupied with delivering comprehensive education that includes health.  Teachers have a sense of competition amongst colleagues</p> <p>The Quebec Education Program ‘reform’ is identified as in need of validation in the school with regard to practices which implement and evaluate social competencies.</p> <p>Nutritionist perceives her role in the school as legitimate;  - Perceives teacher as having confidence in her  - Perceives herself as having professional credibility among teachers  - Perceives ED Dir support</p> <p>Nutritionist perceives herself as an animator of the nutrition workshop who is;  - In control of class  - Independent of teacher  - Standardizes her practices  - Masters her practices</p> <p>Nutritionist perceives her practices as a distinct member of the Nutrition team;  - secure, developed and consistent</p>
School B	<p>ED Director is identified as a legitimate spokesperson for teachers.  ED Dir makes decision regarding presence of program in school.  ED Director has been a permanent figure in the school.  ED Direct wants to implement health curriculum.  ED Director wants programs that bridge parental participation in school</p> <p>Teachers are pre-occupied with delivering course material, especially math and language.  Teachers are pre-occupied with developing competencies, especially cooperative learning.  Teachers are part of a professional organisation which shares resources.  Have low turnover in school</p> <p>The Quebec Education Program ‘reform’ is identified as in need of validation in the school with regard to practices which implement social competencies.</p> <p>Nutritionist perceives her role in the school as legitimate;  - Perceives teacher as having confidence in her  - Perceives ED Dir support  - But lacking opportunities for informal interactions with teachers  - But lacking opportunities to collaborate and share resources with teachers</p> <p>Nutritionist perceives herself as an animator of the nutrition workshop who;  - Enjoys teacher input  - Actively seeks student input  - Leaves room for students to make errors</p> <p>Nutritionist perceives her practices as a distinct member of the Nutrition team;  - Open, flexible, not controlling, incorporating student input</p>

School C	<p>ED Dir makes decision regarding presence of program in school.  ED Director has not been a permanent figure in the school  ED Direct wants to implement health curriculum.</p> <p>Teachers are pre-occupied with delivering comprehensive education that includes health.  Teachers create an informal environment with casual relationships for pleasure.  Teachers want to learn about nutrition and diet</p> <p>Nutritionist perceives her role in the school as legitimate;  - Perceives teacher as having confidence in her  - Perceives herself as having professional credibility among teachers  - Has social affiliation with teachers  - Bridges parent and teacher relations</p> <p>Nutritionist perceives herself as an animator of the nutrition workshop who;  - Experiments with new practices  - Actively seeks student input  - But is uncertain with parental role</p> <p>Nutritionist perceives her practices as a distinct member of the Nutrition team;  - Open and flexible to try new practices</p>
School D	<p>ED Director is identified as a legitimate spokesperson for teachers.  ED Dir shares decision with teachers regarding presence of program in school.  ED Director has been a permanent figure in the school  ED Direct wants to implement Quebec Education Program Reform  ED Director wants programs that bridge parental participation in school  ED Director lends program school resource (Pedagogic Counsellor)</p> <p>Teachers are pre-occupied with delivering course material, including math, language, science, health.  Teachers are pre-occupied with developing competencies, especially cooperative learning.  Teachers are pre-occupied with evaluating competencies, especially cooperative learning.  Teachers have a sense of competition amongst colleagues  Teachers want to learn about nutrition and diet  Teachers create a pleasant environment with is conducive to change</p> <p>The Quebec Education Program ‘reform’ is identified as in need of validation in the school with regard to practices which implement social competencies.</p> <p>Nutritionist perceives her role in the school as uncertain;  - Perceives teacher as having confidence in her  - Has social affiliation with teachers  - Receives feedback from ED Director  - Changes program approach together with school personnel</p> <p>Nutritionist perceives herself as an animator of the nutrition workshop who;  - Experiments with new practices  - Questions current practices  - Uses past experience  - But is uncertain with parental role</p> <p>Nutritionist perceives her practices as a distinct member of the Nutrition team;  - strategic, thinking about long term survival of program  - leading team to make changes, encouraging others to be inventive</p>



School E	<p>ED Director is not identified as a legitimate spokesperson for teachers.  ED Director shares decision with teachers regarding presence of program in school.  ED Director is approachable but inaccessible.  ED Director is pre-occupied with 'community initiatives'</p> <p>Teachers are heterogeneous  Teachers are pre-occupied with delivering course material, especially math and language.  Teachers are pre-occupied with developing competencies, especially cooperative learning.  Teachers are pre-occupied with evaluating competencies, especially cooperative learning.  Teachers can create an unpleasant informal environment which is resistant to change.  Teachers can negatively role model healthy behaviour to students</p> <p>Nutritionist perceives her role in the school as uncertain;  - Lacks professional credibility among teachers</p> <p>Nutritionist perceives herself as an animator of the nutrition workshop who;  - Enjoys teacher input  - Experiments with new practices  - Leaves room for students to make errors</p> <p>Nutritionist perceives her practices as a distinct member of the Nutrition team;  - following lead of other Nutritionists in the PC-PR team</p>
School F-i	<p>ED Director is not identified as a legitimate spokesperson for teachers.  ED Dir makes decision regarding presence of program in school.</p> <p>Teachers are heterogeneous  Teachers are pre-occupied with delivering course material, especially math and language.  Teachers have a sense of competition amongst colleagues  Teachers want to learn about nutrition and diet  Teachers create an informal environment with casual relationships for pleasure.</p> <p>The Quebec Education Program 'reform' is identified as in need of validation in the school with regard to practices which implement social competencies.</p> <p>Nutritionist perceives her role in the school as uncertain;  - Does not spend enough time in school  - Lacks sufficient social affiliations with teachers  - Lack sufficient trust with teachers</p> <p>Nutritionist perceives herself as an animator of the nutrition workshop who;  - Needs teacher input to be at her best</p> <p>Nutritionist perceives her practices as a distinct member of the Nutrition team;  - as open and flexible to try new practices  - as being insecure with practices and needing to receive feedback</p>
School F-ii	<p>ED Director makes decision regarding presence of program in school.  ED Director is not approachable  ED Director wants to implement Quebec Education Program Reform  ED Director share school resource with Nutritionist (Pedagogic Counsellor)</p> <p>Teachers are pre-occupied with developing competencies, especially cooperative learning.  Teachers are pre-occupied with evaluating competencies, especially cooperative learning.</p>

	<p>The Quebec Education Program 'reform' is identified as in need of validation in the school with regard to practices which implement social competencies.</p> <p>Nutritionist perceives her role in the school as legitimate;</p> <ul style="list-style-type: none"><li>- Has social affiliations with teachers</li><li>- Is building trust with teachers</li></ul> <p>Nutritionist perceives herself as an animator of the nutrition workshop who;</p> <ul style="list-style-type: none"><li>- Enjoys teacher input</li><li>- Experiments with new practices</li><li>- Leaves room for students to make errors</li></ul> <p>Nutritionist perceives her practices as a distinct member of the Nutrition team;</p> <ul style="list-style-type: none"><li>- as open and flexible to try new practices</li><li>- as being insecure with practices and needing to receive feedback</li></ul>
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## DISCUSSION

## 1. Overview of aims and findings

The overriding aim of this thesis was to conceptualize program implementation as a process by which a focal group of actors expanded and stabilized a socio-technical network. Towards this aim, the first study described program implementation in terms of a dialectical relationship between the social and technical program entities. An analysis of retrospective program data permitted the dynamic nature of this relationship to be seen by following the movement of social and technical entities in and out of the network over time in relationship to the goals and values of the interested actors. The second and third studies provided an explanation of the implementation of the program in terms of the over-arching connections that the program interventionists aimed to establish. The second article showed that program interventionists *problematized* the school actors in terms of their goals and interests whereby the program's technical entities were represented as *interessement* strategies to respond to these goals and interests. The third study further detailed these interpretations by following the operation of the program's technical entities during the delivery of one of the program's activities.

Study one aimed to identify the mutually constitutive nature of the social and technical program entities where the operation of the technical program entities was understood in terms of its relationship with the social actors. By accounting for changes over time with the appearance and disappearance of technical and social entities, this study offers an expanded understanding of the nature of the program's technical entities as having a social dimension. Namely, the dynamic of technical entities within the program network was shown to be associated with new connections among actors who integrated their own interests and values, constructions and interpretations of a problem. Interpretations of the issue thus informed the techno-gram. This study further demonstrated that a program, like a network, can converge and diverge as interests become aligned or misaligned. That is, the stability of connections changed over time, where stable connections, characterized by consensual interpretations of the issue, stabilized. Similarly, unstable connections, characterized by contrasting but not necessarily contradicting interpretations, became stable. Connections were found in this study to be provisional where stability depended upon the dynamic created between the social

and technical conditions that changed over time. In this light, conditions changed as the interests of actors who had been present all along changed (e.g. children got older), or became revealed when voices which were previously 'silenced' or unheard, become audible (e.g. teachers who were obligated demonstrated their disinterest).

The second study contrasts the first through its approach to 'following' a focal actor group in their efforts to expand and stabilize a socio-technical network. By following the actors, this study offered a more detailed appreciation of the 'work' required to assemble connections, particularly with actors whose interests were less likely to be in alignment with those of the nutritionists (i.e. teachers, students). This research thus sought to determine if the nutritionists' representations of their actions corresponded to the theoretical propositions advanced by the sociology of translation with respect to *problematization*, and *interessement*. Specifically, this study aimed to find instances in the nutritionist's discourse where she identified school actors in terms of their own pre-occupations and further, situated the program's technical entities in response to those needs. Further, the nutritionist's discourse was also studied for instances where a technical entity could have several different interpretations in relation to different pre-occupations. This study illustrated that nutritionists did indeed describe their actions in terms of establishing connections between social (e.g. students and teachers) and technical (e.g. food and education program components) entities in a manner which corresponded to the sociology of translation. In particular, beyond describing the nutrition workshop in terms of a health promoting goal, nutritionists identified the nutrition workshop as necessary for educators to complete their educational program and for students to enjoy and develop a sense of success with school.

The third study described the mediating and intermediary role played by program entities. In this respect, this study sought to highlight the interpretive and situational strategies used by nutritionists to operate the nutrition workshop in a manner which responded to the particularities of the school setting. The study highlights the variations between nutritionists with regard to how they translated the programs technical entities in terms of the school context. Although nutritionists shared a common representation of nutrition education as a strategy to promote



health and thus as being outside the primary mandate of the school, differences were found in how nutritionists built alliances between the program and the school actors. In particular, some nutritionists represented the technical entities in alignment with teacher interests whereas others translated technical entities in order to build new connections. Nutritionists also differentially experimented with instructional styles and differed with respect to the place they allotted (and often expected) teachers and students take in forming a shared knowledge and food preparation experience.

The PC-PR program has been characterized as a food preparation techno-gram and an educational, community and health socio-gram throughout the entirety of its life (beginning in 1989). While this techno-gram consistently addressed a healthy eating public health problematic by providing a context for the manipulation of food using a workgroup or teamwork approach among school actors living or working in a low income community, the techno-gram by no means operated as a black box. That is, the role of the actors in the network was being negotiated as the program moved through time and between settings. The identities and dynamic of the human and non-human actors, as well as the relationships formed among them, were explained by the various forms of the techno-gram over time and between settings. That is, as the techno-gram was analyzed according to its placement in different localities (e.g., a cafeteria, a community organization, classrooms, schools) new and various actors became interested (e.g., education standards, education program, timetables, pedagogy) thus changing the form of the techno-gram in response. Simultaneously, the emergence of identities, interests and goals of the social groups of actors also transformed the way the program's technical entities operated in the form of a techno-gram. The complexity of social groups was also revealed by analyzing the dynamic shifts in the techno-gram's form.

It follows, that depending upon the contributions offered by actors who became interested, the composition and capacity of the techno-gram to respond to a practical problematic situation became defined as it was being operated. That is, through the connections being operated between the human and non-human actors, during which time the issues and strategies were being negotiated to respond to a variety of pre-occupations. In this light, the program-in-practice was becoming a program-in-theory. That being said however, we saw that these negotiations had

limits and the ability of an actor to respond to the interests of others was not boundless. Actors had to be convinced that following a path which proposed to lead them away from their own goals, was worthwhile. When actors were lead unwillingly or naively away from their own goals the network was formed upon divergent interests and connections were not stable. The success of a negotiation was not given and was dependent, in part, upon the ability of translator (in our case primarily the nutritionist) to understand the needs of the other actors with whom she aimed to build a connection, and to take risks and experiment. As well, successful negotiations depended upon the willingness of the other actors (in our case, primarily the teachers, students and education program) to trust that following the lead of the translator (i.e. the nutritionist) could be advantageous. Along the same lines, nutritionists were being translated by school actors and similarly weighed the risks and benefits of incorporating a change. The process of translation is rooted within the interests and goals of the actors involved and while practitioners can be lead to change their practices, the theories upon which they are based, are not likely to become distorted. In this light, the program-in-theory plays an essential role in keeping negotiations in line with the interests of the actors; however, it does not uniquely define the actions which are taken by the actors.

## 2. Advancing our conceptualization of context and its place in program implementation

The need to consider context during program evaluation is becoming increasingly recognized in public health program evaluation (Glasgow, Lichtenstein, & Marcus, 2003, p. 1264; Glasgow et al., 2006). Implementation frameworks guide evaluations to provide rich descriptions of the context such that program mechanisms which may or may not be functioning in one setting can be transferred to another setting with similar characteristics and thus, improve the probability that the same mechanisms will be triggered. However, this approach arguably takes a simplistic view of context by assuming that socio-demographic profiles, race or ethnicity, type of setting or intervention agent or levels of experience might provide good indicators to capture the essential characteristics of the setting (Glasgow et al., 2003, p. 1264). This approach is likened to conceptualizing context as something within which a program 'floats' (Poland, Frohlich, & Cargo, in press). Our results

suggest that while implementing a program, interventionists take a deeper look at the social context of the setting and how it might relate to the program. Teachers were described to take on various roles in relation to the program, including co-teaching the nutrition workshop, class management, building contacts with family and workshop preparation. While nutritionists represented some teachers as supporting and valuing health education, others explained teacher's actions more broadly, in terms of their own philosophies of child development or pre-occupations with curricular delivery and evaluation. In this light, our results suggest that understanding why mechanisms may have been triggered in a setting may be best informed with an understanding of who the actors are and how they interpret the utility of a program, and how the program may have adapted in accommodation to those interpretations.

Among health promotion evaluators, the need to go beyond a conceptualization of context as a set of confounding factors that can be controlled through pre-stratification or matching on cluster size is recognized (Hawe, Shiell, Riley, & Gold, 2004). Here *program in context* evaluation has been proposed as distinct from process evaluation, where the former deals more directly with the setting and how it impedes or contributes to a program's success, and as such, as step beyond process evaluation which is limited to tracing the intended delivery of the program. This approach is proposed as a means to "delve deeper into the intervention" (Hawe et al., 2004, p. 789) thus echoing a need to shift attention off of an evaluation onto the program (Weiss, 1998, p.46). While this thesis follows this line of study, its approach to context is somewhat distinctive. Namely, as opposed to viewing context as a "setting within which an intervention is implemented" (Hawe et al., 2004, p. 789), context is understood as what "shapes how phenomena are manifest, how they are taken up, resisted or modified" (Poland et al., in press, p. 1). As advanced by Hawe (2004), program rhetoric is differentially "interpreted, translated, subverted, or deployed" by program interventionists as they mediate the various contexts of their practice. In this respect, the program and the context can be understood as actively redefining one another. Our results show that program rhetoric was differentially interpreted and that the program's technical entities were differentially operated across settings. Further, by applying the ANT as a conceptual framework, we show this negotiation as part of a rational and strategic process

whereby program interventionists advance the goals of the program only as far as they have considered the identity of the other actors involved.

### 3. Situating findings in the empirical literature

As health professionals, nutritionists were mandated to assume a role of health educator, and as such, could easily have been perceived among educators as external to their core preoccupations. As service providers based within a community organization, and thus external to the organizational structure of the educational institution, nutritionists would be further challenged to assert their role in the school (Massey, Armstrong, Boroughs, Henson, & McCash, 2005). This need to adapt or respond to the conditions of the school (i.e. “embedding”), has been described in terms of the role which a new actor must “invent” or define when their own pre-defined role and purpose has little meaning to the actors in a new setting (Massey, 2005, pp. 366). Similarly, variations between schools with regard to the interpretations attributed to an interventionist’s health promoting role are described (MacDonald & Green, 2001). Here, in response to various interpretations, interventionists reconciled a pre-defined health promoting role with the interpretations school personnel themselves had of that role. Our findings that nutritionists were pre-occupied with their identity and its legitimacy in the school is in line with these findings. Further, the amount of ‘work’ required to build an identity was not the same between nutritionists where some perceived their role as health educators to fit within the school whereas others did not.

In addition to re-iterating ‘role legitimacy’ as a key element within the context-program interface, our study has described how new roles might become legitimated through the process of *interessement*. In this respect, nutritionists made slight adjustments to the practices by which they placed the program technical entities into operation in order to facilitate the ‘fitting’ of nutrition education with the educational institution. Arguably, this process is analogous to what nutritionists described as “*becoming part of the furniture*” in the school. In this light, building social affiliations and trust among teachers was a strategy nutritionists used to acquire input and feedback on the workshops, such that their operation of the workshop could incorporate more educational (non-human or technical) actors.

This study emphasized the social processes within the implementation of an innovation by illustrating the interconnectivity between the technical and social entities of an innovation, and how and why actors implicate themselves into this dynamic. In so doing we further suggest that the defining characteristics of the technical entities and the manner in which they may become differentially interpreted according to the needs of the various school actors is influenced by the relationships which are present within a given setting. Namely, nutritionists distinguished schools based upon an atmosphere whereby teachers appeared more or less willing to embark with a new program. The quality of relationships between teachers, administration and students is clearly recognized among education scholars as impacting the implementation of education innovations (Lochman, 2003). A positive school atmosphere is commonly associated with higher levels of implementation measured by dose or the number and duration of sessions (Gregory et al., 2007). However, beyond dose, teacher motivation to integrate program content into the curriculum is recognized within this literature to be the mediating mechanism explaining why a teacher would implement new teaching practices or course content (Tanya, 2007). Namely, teachers who feel part of a team based upon trusting and responsive relationships, in control of their own work and as part of a larger mission with inclusive norms are more likely to have motivation to experiment with new practices (Gregory et al., 2007). This observation meets our own in that in order for teachers, like program implementers, to participate in a change, they must become implicated with the change by inserting their own interpretations of the issue and operation of the technical entities in response. This observation thus suggests that this interpretive process occurs in environments where making this kind of investment is perceived to be worth while.

In addition to being aware of the school atmosphere in terms of teacher's willingness to embark upon a new program, nutritionists also characterized the education institution more generally as being unpredictable and unstable, where integration was perceived as being unattainable. Identifying opportunities to build new connections and being ready to take action in this respect, was identified as a 'survival' strategy in this environment. This characterization of schools does not appear to be limited to the experience of innovations which are external to education.

The limitations of innovation planning and evaluation among educators based upon “a narrow and decontextualized programs as packages perspective” (Elias et al., 2003; pp. 303) is recognized due to the fact that the configurations of diversity in schools are ever shifting. What constitutes this diversity regarding innovation is simply associated with the fact that “innovations are dependent on human operators for their implementation” (Elias et al., 2003; pp. 304). The author’s concept of ‘assimodation’; defined as a balance of assimilation of innovation to existing structures and accommodation of those structures to incorporate the innovation’s key elements, meets Latour’s notion of ‘translation’; described as a process of enrolling actor’s to contribute to the form of the innovation, yet controlling that investment such that the innovation itself maintains its identity.

There is a tendency to describe programs through the lens of one program theory and to hold it tightly bound to the practices anticipated to result from it (Friedman, 2001). However evaluations of theory-driven evaluations note that the involvement of program actors and the interactive process of program theory development “pose substantial implementation challenges in practice” (Donaldson & Chen, 2001, p. 15) quoted in (Friedman, 2001). Nutritionists described themselves as adhering to at least two distinct perceptions of how their actions could have a positive influence upon students. Some theories were very holistic whereby feeding students curiosity with food and implicating them in the food preparation process in a pleasant environment was sufficient, and as such, nutritionists clearly indicated that their goal ended here, with the children and not with what would be the short or long term outcome of this endeavor. Others were making practices efficient to build capacity so that the workshop would have an effect in the home. These nutritionists were concerned with how the conditions created during the workshops would influence family feeding as well as the students own future decision making process. Re-interpretations of how technologies or curriculum can respond to a problematic are common whereby program implementers may have altogether different ideas of the utility of a technology and how it may, or may not, permit their practices to become more effective (Weston, 2004). For example, in contrast with plans, computer technologies in classrooms are often described to have little effect upon the methods teachers use for teaching (Weston, 2004) and community interventionists are described to re-formulate their practices in accordance with their

indigenous knowledge of how members of their community learn best (Power et al., 2005).

#### 4. Towards a new theory of program implementation

The work of this thesis extends the body of work that critically analyzes the trajectory of a program represented by the stage model (Pluye, 2002). This thesis supports the suggestion that programs are planned, implemented, sustained and evaluated by a set of processes which are concomitant as opposed to sequentially falling one after the other. That is, “social structures within which programs are sustained appear during planning and implementation” (Pluye, 2002; pp.39). In this respect, programs may become organizational routines and become increasingly integrated into the normative or institutional system of the organization as they are planned, implemented and evaluated. The results of our study confirm that these processes are occurring during implementation by describing the micro-processes which underlie the emergence of these social structures. For example, interventionists aimed to establish a solid connection with the timetable, and to maintain this connection they were willing to maintain some flexibility on duration. In this respect, the workshop became part of an educational routine. But beyond this, interventionists also aimed to connect to the educational ‘furniture’ namely, to become more solidly connected to the institutional structure, namely, the Quebec Education Program (QEP).

In line with this work by Pluye, this thesis challenges notions that posit implementation as a phase or part of a chain of events (Scheirer, 1994). Although “in reality, the activities in each phase are likely to overlap, to occur out of sequence or to require recycling back to an earlier phase during implementation” (Scheirer, 1994, p. 44), the actions or interactions which capture this iterative and dynamic process of implementation seem to be often overlooked. It appears that implementation is still anticipated to follow after planning and the ‘feedback loop’ where planning then follows implementation is given far less attention. Our study provided empirical evidence that planning did indeed follow perceptions of what had, or had not, been successfully implemented. Namely, the ability (or lack of) of current connections to meet mutual needs influenced program actors ‘branching out’

to build new connections or to reformulate and transform connections in a way to align interests. For example, transformations to the techno-gram in order to maintain a connection with the timetable or to establish a connection with QEP occurred when teachers' interests diverged from health education. Where schools were represented as valuing health education the interventionist described their role in the school as fulfilling a need which was already present (i.e. having a solid connection with QEP). Thus, transforming the program techno-gram to build a connection with the QEP was not necessary. In contrast, where nutritionists did not perceive an alignment in interests for health education in the school, they had to create a need for the program, and they did so by transforming the techno-gram into a form which established a connection with the QEP. Similarly, where teachers were represented as valuing holistic development and/or nutrition education, the placement of the workshop on the timetable was not questioned. However, when the nutritionist identified divergent interests, they tried not to break a fragile link by staying flexible and making few demands or by presenting the workshop as a timesaving device due to the core curricular topics which were part of the workshop content. Along similar lines, reducing the number of students per table, increased the cooking tool to student ratio, and in so doing, increased the opportunities for students to connection with the tools instead of becoming distracted with other students.

This work also offers a re-interpretation to what is meant by theory-based evaluation. As defined in the literature, theory-based evaluation is a process by which the assumptions upon which the program is based are surfaced in considerable detail with respect to what activities are being conducted, anticipated effects of activities and expected outcomes (Chen & Rossi, 1987; Chen, 1990; Weiss 1995, 1997, 1998). The evaluation is described to follow each step in sequence to see whether the expected mini-steps (i.e. mini-theories) actually materialized (Lipsey, 1993). Applying the ANT as a conceptual framework conforms to this definition of theory-based evaluation, particularly with respect to a need for it to be based upon social theory (Chen & Rossi, 1987). Namely, the ANT perspective applies the assumptions, activities and outcomes to the interactions between program actors, where successful outcomes occur when an actor is enrolled or mobilized or a connection is stabilized. That is, when an actor, who has been attributed a role within a program, accepts that role and behaves according to it. Contrasted with



theory-based evaluation as interpreted by Weiss (1998), Lipsey (1993) and Chen (1990) however, our approach to theory based evaluation is attentive to the possibility that mini-theories might change as they are being practiced, whereby, mini-theories as originally conceived, may lose their 'explanatory power' over time. For example, some nutritionists described their approach as being less focused upon health education per se, than about enhancing the social competencies due to changes in their own conceptualization of health promotion.

Our approach also differs from theory based evaluation in its approach to represent the actors who may or may not fulfill the activities or play the role as anticipated. Theory-based evaluation measures the occurrence of events as either being or not being present in a way which dichotomizes action as either in support or not of the theory (Birckmayer & Weiss, 2000). For example, an actor either did or did not perceive another actor as a role model, fully or incompletely delivered a lesson plan. While nutritionists may not have completed their lesson plan, by asking why or how they went about their implementation activities, we found that these adjustments were necessary adjustments to the expectations of the teachers whose pre-occupations were not centered upon health education.

The use of notions such as a 'chain of assumptions' (Scheirer, 1994) or 'sequence of hypothesis based upon mini-theories' (Lipsey, 1993) implies that actors will behave in a controllable and predictable manner. In testing the utility of theory based evaluations in the empirical literature, Birckmayer & Weiss (2000) found that programs were often not implemented in a manner which conformed to their theoretical underpinnings, and suggested that either program activities be adjusted in order to fit the theory, or that the theory be changed in order to fit the program. Furthermore, their study revealed that many different theories could have been guiding the same program activities. According to these findings, the authors state that "assessing exactly where the hypothesized theory breaks down, calls for more finely grained study than most evaluators have yet included" (Birckmayer & Weiss, 2000, p. 429). Thus, program evaluation reveals that program actors do not behave in controllable and predictable manners. This notion however is difficult to reconcile with models of implementation which are based upon chains of assumption as this model implies that actors are cohesively interpreting and practicing the program

theory as articulated at a point in time which was likely to be outside the context of its actual practice (i.e. during the 'planning' phase).

Mediation poses an important challenge to implementation evaluation. Human and non-human actors behave in unpredictable inconsistent ways, whereby the effects of a given action are difficult to control. For example, as part of a nutrition education program food may be identified as a means to healthy eating, and represented by its nutritional value and in this program, as a product of human control or manipulation. However, food takes on multiple social meanings and the program certainly cannot control the meanings which are ascribed to the food which is prepared during the nutrition workshop and sent home by way of connecting parents to the school through the take home food sample. Nutritionists described the 'reality' of the 'market value' of these food samples as objects of exchange between students. Food took on a value, which for some students was based upon the pleasure of taste, while for others, may have been its market value for them to acquire another object. Likewise even amongst nutritionists food as a means of pleasure was differentially interpreted. For some, creating a pleasurable experience with food was an end in itself, whereas for others, it was a means to link to family, make change in the home, and motivate students to adapt healthy eating practices. These different representations had important consequences upon the workshop, where in the former, the workshop was loosely controlled and in the later, highly controlled.

Acquiring and maintaining stakeholder interest required Nutritionists to play a mediating role whereby they made compromises and negotiated the placement of the nutrition workshop on the teacher timetable and the role of the nutrition education within the education program. By acting as mediators, nutritionists considered both the interests of the school actors in addition to their own personal preferences. The need to build connections which drifted from the nutritionist's primary pre-occupation to deliver nutrition education was not equal among the nutritionists. For example, the need to compromise the nutrition workshop by expecting less time and commitment from teachers differed between schools and was associated with more translations. On the other hand, some nutritionists expressed their own personal preference for experimentation and trying new practices which

increased the level of risk and unpredictability between workshops, whereas others took comfort in their capacity to systematically deliver the lesson plan and run the food preparation components of the workshop.

Both the proposition advanced by Pluye (2002) and the work presented here, conform to the perspectives advanced by the ANT that, in order for an innovation to be used and to remain useful, people must become invested and contribute to the form of the innovation. In this light, the significant questions lie not in the point in time where this contribution takes place (i.e. whether it occurs during planning, implementation, or institutionalization) but rather why and how entities assemble and remain assembled in a network based upon aligned interests. We have shown that many education stakeholders became engaged with the program not because it represented an opportunity to learn about nutrition and healthy eating but rather, because it responded to a need for positive experiences at school (for students), or an opportunity to deliver and evaluate a new education component (for teachers). Beyond responding to the interests of actors however, stabilizing connections involves carefully selecting and positioning the program in connection with ‘larger’ or more permanent technical entities. Here, technical entities specific to a program (e.g. a recipe, food preparation activity, a nutrition workshop) are tied to much larger ones (e.g. education program, evaluation student competencies) with “the idea that this tie becomes so tight that threatening the former is tantamount to threatening the latter” (Latour, 1987).

The defining characteristic of a connection is thus based upon an alignment of interest. That is, for an actor to remain in alignment they must be able (or be shown how) to interpret an issue as having relevancy for the accomplishment of their own goals in conformity with their own values. However, as stated by Latour (1987) interests are elastic and thus can be pulled in accommodation to those of others, but like rubber, there is a point where they break or spring back. This potential was illustrated in two ways in our data. First, as the interpretation of food security became increasingly professionalized, moving from the school cafeteria to the classroom, opportunities for the community actors to contribute their interpretation became limited and the community-professional partnership expired. Although, the issue, food security could arguably be interpreted as having a key stake in the

community (i.e. in the home), this interpretation become (temporarily) silenced. Thus, along these lines, the strength of a connection may be misleading when the actors who speak on behalf of a group does so with limited legitimacy (i.e. representation). In this respect, we saw that at different periods of time, according to the dominant interests, the spokesperson's legitimacy was questioned. This first appeared as the techno-gram moved from the cafeteria to the classroom and shifted from food service to nutrition education, again, when the nutrition education techno-gram enlarged with the aim of reinserting community actors (i.e. community development workers and parents) and finally as certain schools imposed the program upon disinterested (i.e. obliged) teachers. Here, when a group of actors' interpretation of the issue is silenced, so is their ability to inform the establishment of a techno-gram which is responsive to their needs and with which they can become engaged.

## 5. Strengths and Limitations

The primary purpose of qualitative research is to use data in “ways that will, first, facilitate the continuing unfolding of the inquiry, and, second, lead to a maximal understanding...of the phenomenon being study in its context” (Lincoln & Guba, 1985; pp. 224). The key strength of this study can thus be found in its interpretive approach to build understanding of the processes by which health promotion programs are practiced within and across contexts. The study reveals the practice of implementing a program as it unfolds interactively with its context, and in so doing, divulges detail largely ignored in the implementation literature. Further, as an interpretive case study following the research design described by Yen (2003) and Stake (1994), empirical propositions were theoretically grounded. In this respect, a second key strength of this study can also be found within its articulation between the aims, empirical data and theoretical orientations (Laperrière, 1997).

However, while on some levels the incorporation of the ANT theoretical framework strengthened the rigor of the overall study design, the use of this conceptual framework also contributed to several of the study's limitations. One key limitation of this study rests in the naiveté with which the ANT theoretical principles were extrapolated to the phenomena under study and the suitability of the procedures

which were used for this purpose. This is arguably the unavoidable consequence of using an approach which is novel to a discipline for the purposes of describing a phenomena with an entirely new perspective. It is only through further application of this theoretical framework across health promotion program settings, that the operational refinement of key concepts can be achieved and its appropriateness fairly judged.

While the sociological literature is rich with empirical demonstrations of ANT across wide range of phenomena, no study to my knowledge, has discussed in detail the research design, operationalization of key concepts and validity criteria which are appropriate to an ANT analysis. Because these are vital to the construction of knowledge in public health research, their relevance to our study cannot be ignored. In particular, since the precision of concepts employed here was worked out during data analysis, this study can make only limited claims regarding construct validity. One major threat to validity therefore is the vagueness with which the key concepts were operationally defined prior to their ‘measurement’ in the data.

Several strategies were, however, used in order to improve validity between the theoretical constructs guiding the analysis and their appearance in the data. In particular peer debriefing and a validation process by an external reviewer served to validate that analytic choices, and that ANT interpretations made sense. However, as data came together and as my conceptual ‘maturity’ grew so too did my creativity in bringing the data to a place where it could be interpreted with the ANT framework. In particular, the data were consulted repeatedly whereby I gained familiarity of each of the nutritionists and the circumstances they confronted in their schools. Further, this experience with the data assisted my understanding of how the principles advanced by ANT were operating during the nutritionists activities. Beyond the coding and their formation into tables, study results were thus further devised from an intuitive comprehension of how the ANT framework applied to the processes through which the nutritionist implemented the program. Thus maintaining rigor was achieved through a balance of auditable and traceable research procedures combined with elements of creativity. This creative element is supported by those who argue that “research is both a creative and a destructive process; we

make things up and out of our data, but we often inadvertently kill the thing we want to understand in the process” (Sandelowski, 1993; pp. 8).

This study applied an ‘ANT lens’ to interpret the representations and practices of program interventionists and the genealogy of the program over time. If this theory was inappropriate to study program implementation, its use would threaten the internal validity of the study results. While some rival explanations were investigated, further verification in this regard would have strengthened the internal validity of the study. In particular, the analytic process as a whole was largely deductive, particularly with respect to the interpretations of workshop observations, thus providing limited opportunity to challenge the theoretical presumptions of ANT. Similarly, the analysis did not verify nutritionists’ interpretations against those of other actors. In this respect the way nutritionist *problematized* teachers and students may or may not have corresponded to the actual reasons why those other actors did or did not engage with the program. Thus, internal validity of this study may have been strengthened through interpretations which permitted stronger evidence to support or challenge the application of the ANT framework to the practice of health promotion program implementation.

The internal validity of this study would have benefited from a longer field work and data collection experience. Ideally interviews would have been completed at several time points during the academic year to refine the key ANT concepts and detail their appearance in the data more fully. Also, observations would have been completed for a minimum of 3 workshops per nutritionist in order to better distinguish variations in practices which were consequential to the topic versus being due to an intentional change in the workshop functioning. Here, the opportunities for workshop observations varied considerably between nutritionist, and consequently some nutritionist were observed more than others. Lastly, observations would have ideally extended beyond the nutrition workshop. In particular, spending more time in the school during every day interactions between the nutritionist and other school actors would have provided opportunities to see how connections between the nutrition intervention, teacher timetable and educational institution were being built.

However, while the official data collection period was relatively short, field work lasted one year. Further, my presence among the nutritionists in the community organization office and during workshop set up and clean up built a positive rapport between us. I made my intentions of evaluator clear and my genuine appreciation for their work in the program was communicated on several occasions. Being present before the beginning of the workshop and staying to help with clean up and dishes provided the context for casual exchanges and an eventual trusting relationship to develop. When time came for interviews a familiarity had been established, and this facilitated an ease of conversation during the interview. Further, based upon this familiarity both with the nutritionist and with the classes and teachers, when it came time to record the workshops, my presence had already been accepted and familiar. Thus, while my presence during the workshop likely had some effect, I would contend that special role playing on behalf of the nutritionist, teacher and class was minimal.

The interview guide was constructed with the aim of revealing the experiences of the nutritionist, identifying their program and implementation theories, and how conditions in the schools influenced the practical application of these theories. In fact, the interview guide was not constructed with the aim of applying the ANT conceptual framework. Certainly the data analysis and possibly the resulting analytic detail would have been facilitated had these concepts been integrated into the interview. Still however, the emergent processes revealed the many of the anticipated ANT propositions were present in the data, which lends support to the appropriateness of this framework to the study of this phenomena.

The aim of this case study was not to build statistical generalization but rather analytic generalization. Thus, we aimed to generate knowledge as to the relevance of applying an ANT analytic approach to program implementation. The nutrition intervention program selected for this purpose is unique relative to similar type interventions which are found in the scientific literature. Nutritionists themselves created the workshops and were encouraged by program direction to experiment with new practices. This provided the conditions where nutritionists experienced relatively few restrictions on their freedom to make adjustments. When interventionists do not have this freedom the ability to see a co-productivity between

technical and social entities would likely be restricted. For example, in the case of the community intervention PRISM, although practitioners noted the need to make adjustments, they did not perceive themselves as having the freedom (or support) to do so (Hawe and Riley, 2005).

A strength of this study lies in the application and development of a theoretical framework which was taken from larger more overarching processes to specific micro-process and practices. The application of this conceptual framework revealed interesting findings in each of these three sets of data analysis. This suggests the robustness of this procedure to build understanding of the program implementation process.

## 6. Practical Implications

The settings approach is increasingly being used as an approach through which schools can be supported to engage in changes which promote health. In an attempt to increase the legitimacy of health promotion activities in schools, recommendations that health promotion evaluation consider how activities contribute to outcomes which are valued by education actors are presently being launched (St Leger, Kolbe, McCall, & Young, 2007). While our research suggests that translation of goals is a key component within the actions our results also suggest that teachers are a heterogeneous group who variously interpret educational mandates and likewise, schools also may prefer to stress some components of an educational program over others. Thus, rather than imposing a pre-defined evaluation model upon the practices of health promotion practitioners in schools, our results suggest that by following their representations of the school social context, interpretations of the technical program entities, and their practices during program delivery, evaluators are privileged to a wealth of knowledge from which quality implementation can be assessed. One of the fundamental roles taken on by the interventionists was to describe the social context of the school. Practitioners actively considered the social context of the school, and can be described as evaluating the social, culture and political context and considering these in the own implementation frameworks and forming intervention through these partnerships.



Nutritionists provided rich details on the identity of the teachers, how these varied within a school and how they compared between other participating schools. Nutritionists also interpreted these identities and their variations in terms of the program's objectives. In this light, nutritionists were actively evaluating the context, how they could fit the program into it and how this context might mediate their influence upon the students. Quality implementation then, might consider the presence of a 'sketched' network, whereby the interventionists have identified and described a range of actors with whom they aim to build alliances. Quality implementation then could begin by considering the richness of detail, the variation and completeness with which these identities have been built. Further, quality implementation might also be assessed based upon the formulation of *interessement* strategies whereby possibilities to make adaptations in the operation of a technical entity or the uptake of a role are identifiable.

## CONCLUSIONS & CONTRIBUTIONS

This thesis set out to apply a sociological theoretical framework to study the implementation of a health promotion program. The rationale for this approach was based upon a paradox within the implementation evaluation literature, where, on the one hand, empirical evidence indicates that programs are rarely if ever practiced in conformity to espoused program theory specified *a priori*. And, on the other, exudes an implementation theory within which, in order to be effective, practices are anticipated to conform to program theory. This thesis further responds to a problematic approach taken by current implementation frameworks to conceptualise the social context of settings as no more than confounding factors which interfere with practice and the potential of programs to be effective. Based upon this problematic, an area of study which has been applied to health technology (Lehoux, 2006) and service (Denis, Hebert, Langley, Lozeau, & Trottier, 2002) research was incorporated. Namely, social studies of technology provided a suitable framework to study programs as technologies constituted through dynamic and inter-dependent relationships between social and technical actors. This framing provides a rationality with which the practices to operate program activities can be understood as intimately connected to the social context of the setting.

This study has led to what we believe to be three contributions to the knowledge base of health promotion program implementation. First, we offer a reformulation of the program-in-practice and the program-in-theory dichotomy. As opposed to occurring sequentially, whereby a program is theorized and then placed into practice, we suggest that as programs are practiced actors are learning and revising the theories upon which their practices are based. Here, what actors learn and how they revise their practices occurs through the complex social interplay between the human and non-human actors which may become interested in the program. Practice can thus be strategic in that it responds both the program's theoretical assumptions according to the context within which the program is practiced. This contribution has relevance for evaluating the settings approach of health promotion. Further research is needed which refines this iterative process as it develops over time, to bring forward the preceding

personal and organizational conditions in which practices shift and how this change may be represented as a response to program theory as well as to local conditions.

As a settings approach, the health promoting schools initiative poses particular challenge to the nature of a program. Namely, the object of study does not conform to familiar representations of programs based upon a clearly defined problem and a logical framework of resources, activities, effects and outcomes. What is considered to be 'inside' or 'outside', the program boundaries, and thus subject to measurements to determine the program's operations, is not easily defined, and would in fact be expected to change over time as the program becomes increasingly integrated into the routines and organisational functioning of a setting. This thesis proposes an alternative lens through which program operations can be understood which does not project a pre-determined normative framework upon these operations. A network perspective lends itself to the dynamic reality which is known to characterise program operations as they shift and adapt over time and space. Understanding this network as constructed through the strategic actions of program interventionists adds further to our understanding of this role as being less concerned with reproducing a program plan and translating it to the particularities in the settings.

Second, this thesis offers a contribution to health promotion evaluation by creating a connection between it and another body of research, namely the social studies of technology. This work thus falls in the footsteps of others in public health research which has expanded our understanding of what health technology is through the guise of social representation (Denis et al., 2002; Lehoux, 2006), and in so doing offers an alternative framing of what programs are and how they might be evaluated. In particular, this framework might respond to current conundrums in health promotion evaluation. For example, the recognition that programs need to be adapted while still ensuring a modicum of control with reasonable implementation integrity which contributes to the best practices knowledge base (Castro, Marrera, & Martinez, 2004; Rootman, Goodstadt, Potvin, & Springett, 2001).

Further to this, and as our third contribution, this thesis has operationalized this conceptual framework in relation to a concrete program. It thus offers a beginning to a methodological approach which may have relevance for health promotion evaluation and can be applied by other researchers. In this respect, research is needed to debate these concepts, their operationalization and to apply this conceptual framework to another case.

This thesis addresses this familiar fidelity vs. adaptation tension with a new perspective. While the adaptation versus fidelity debate has been longstanding (Blakely et al., 1987), it can be arguably described as a stagnant discussion where those who advocate for the need for adaptation have been generally reliant upon ontological frameworks and constructivist methods that offer limited generalizability. This thesis proposes a novel qualitative method and situates this method within an ontological framework which acknowledges that social phenomena, like natural phenomena consist of regularities. This thesis thus provides an alternative qualitative evaluation tool which may fill a gap between a need for rich contextual detail which captures the local realities of the program-in-practice, while producing knowledge which is generalizable beyond the unique case. In this respect, this thesis suggests, contrary to commonly held assumptions (Greene, 2007) that qualitative program evaluation research can inform generalizable knowledge.

The problematic practice within evaluation research to be methods-driven has been recognized (Potvin, 2004). It is a common theme that lies at the centre of evaluating the settings approach to health promotion (Dooris et al., 2007). The health promoting schools approach provides a poignant example of the consequences of neglecting to pay attention to the nature of the object which is being evaluated. The risk here is that while there is a clear recognition that traditional approaches to evaluation are not suitable, calls for new methods and more context rich data have not reflected upon what these methods and data are aiming to uncover, and thus may continue to rely upon ontological frameworks which may in fact denude the legitimacy of the health promoting schools approach with false negative results (Dooris, 2005).

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## APPENDIX A

Bisset, S., Potvin, L., Daniel, M., & Paquette, M. (2008). Assessing the impact of the primary school-based nutrition intervention Petits cuistots - parents en réseaux. *Canadian Journal of Public Health, 99*(2), 107-113.

# Assessing the Impact of the Primary School-based Nutrition Intervention *Petits cuistots – parents en réseaux*

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## ABSTRACT

**Objectives:** This study sought to provide an intermediate impact assessment of the nutrition intervention *Petits cuistots – parents en réseaux* (Little Cooks – Parental Networks) on: 1) knowledge, attitude, capacity and experience with regard to nutrition, diet and cookery, and 2) parental and/or family participation in school.

**Participants:** A total of 388 students from grades 5 (participants) and 6 (non-participants).

**Setting:** The evaluation of the nutrition intervention took place in each of the seven participating elementary schools, all of which are located in Montreal's most disadvantaged neighbourhoods.

**Intervention:** The program component "Little Cooks" is a nutrition workshop run by community dietitians. Each of the eight annual workshops features a food item and nutrition theme with a recipe for a collective food preparation and tasting experience. Classroom teachers participate to provide classroom management and program support. The "Parental Networks" component of the program invites parents to assist with the nutrition workshop, and offers additional parent and family activities which link to nutrition workshop themes (e.g., dinners or visits to local food producers).

**Outcome:** The program had some impact on knowledge of the nutrient content of food, food produce and cooking; attitude and experience with tasting of new or less common foods; and perceived cooking capacity. Families with students participating in the program participated more in school activities than did families of students not in the program.

**Conclusions:** Our assessment indicates a potential program impact upon several intermediate impact measures, and in so doing highlights a promising nutrition capacity-promoting intervention.

**Key words:** Program evaluation; primary schools; food habits; health promotion

*La traduction du résumé se trouve à la fin de l'article.*

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Recent approaches to nutrition education provide concrete experiences with food and integrate into core curricular subject areas.<sup>1-7</sup> Such interventions are premised on theory<sup>8</sup> and empirical research<sup>9</sup> showing that children's food preferences are strongly influenced by associative conditioning from direct experience with food. This study presents the results of an intermediate impact assessment of a novel nutrition intervention promoting nutritional and culinary education for schoolchildren and their families' participation in school activities. The program theory holds that children can be motivated to develop dietary behaviours which prevent chronic diseases by building their interest with food and cooking. The overarching strategy instructed students about food and nutrition, and placed students in action preparing and tasting food. The constructs evaluated for the purposes of this study included: 1) knowledge, attitude, capacity and experience with regard to nutrition, diet and cookery; and 2) parental and/or family participation in schools.

The nutrition education intervention *Petits cuistots – parents en réseaux* (PC-PR) (translated as Little Cooks – Parental Networks) is a community-based initiative which began as a collective kitchen and expanded into a nutrition education program in 1998.<sup>10</sup> The program component "Little Cooks" is a nutrition workshop run by community dietitians hired full time by the community organization *Cinq Épices*. Each of the eight annual workshops features a different food item and nutrition theme together with a recipe. Classroom teachers are asked to provide classroom management and program support. The recipe and tasting sample provide take-home examples of the cooking experience in order to link the "Parental Networks" component and invite parents' participation in the nutrition workshop. Community workers (also working full time for the program) invite parents to activities for themselves and their family. Information on the program and process evaluations are available online (<http://www.cacis.umontreal.ca/pdf/Bilanactivites2006.pdf>, Accessed February 20, 2008).

## METHODS

### Design and sample

The study was conducted within the 7 participating schools, all of which are located



in the most disadvantaged neighbourhoods in Montreal.<sup>11</sup> The study involved a cross-sectional survey of grade 5 students participating in the program for up to 6 years and grade 6 students at the same school (“non-participants”) who were not ever intentionally exposed to the program. The program was implemented uniquely in kindergarten classrooms in 1999/2000. Nutrition workshops occurred 8 times per year with a 1.5 hour duration (12 hours per year).

In the spring of 2005, all students whose parents had consented (81.1% of 497 grades 5 and 6 students combined) were invited to complete the nutritional survey. Among those consenting, a total of 388 students (78.1% of eligible) completed the survey during class time under examination conditions. Institutional review board approval was provided by the University of Montreal Faculty of Medicine’s Ethical Research Review Committee.

**Nutritional questionnaire**

The identification of impact measures and construction of survey questionnaire involved a strong collaboration with program staff and administration, and was guided by program documentation, participant observation and published evaluations of other elementary schools nutrition programs.<sup>12-19</sup> The questionnaire was pilot tested within two ‘mixed’ classrooms with grades five and six students (n=43), in a school serving a demographically similar population. On-site testing verified student comprehension and duration and reliability analysis verified internal consistency of scales, variation of knowledge measures and co-variance of experience and capacity measures. Standard questions for assessing knowledge and skills believed to mediate healthy eating behaviour<sup>12-19</sup> are not suited to interventions emphasizing an interactive approach to learning.<sup>4</sup> Contemporary approaches to evaluating nutrition education have assessed knowledge in relation to ecology, technology and science<sup>4,6,20-25</sup> or food preferences and readiness to try uncommon foods.<sup>4,26</sup> Such tools were not applied to our evaluation as they assess impacts highly specific to the activities of the program in which they were developed and used.

**Measures**

Measures were inspired from questionnaires evaluating nutrition interventions for primary school age children (Appendix A).<sup>12-19</sup>

**TABLE I**  
**Characteristics of Program Participants and Non-participants (n=388)**

Variables	Grade 5 Participants (n=209)	Grade 6 Non-participants (n=179)
<b>Rate of Participation</b>	<b>81.6% (209/256)</b>	<b>74.3% (179/241)</b>
Sex (n=385)		
Male	54.6%	51.1%
Missing	0.01%	0.01%
Attendance at present school (n=388)		
Mean number of years (std dev)	4.2 (2.08)	4.9 (2.28)
Proportion new to school	28.2%	22.9%
Siblings in same school (n=388)		
Proportion with sibling participating in program	41.7%	46.3%
Mean number of siblings (std dev)	0.64 (0.82)	0.63 (0.82)
Participation of family or guardian in school activities (n=388)		
“Often”	11.5%	6.1%
“Sometimes”	31.6%	18.4%
“Never”	56.9%	75.4%
Perceptions of school (n=388)		
Liking for school at the moment		
Likes school a lot	38.7%	36.9%
Likes school a bit	46.1%	45.5%
Doesn't like school a lot	10.3%	13.6%
Doesn't like school at all	4.9%	4.0%
Satisfaction with school (std dev)	3.82 (0.87)	3.63 (0.98)
Perception of classmate support (std dev)	3.76 (0.76)	3.83 (0.65)
Perception of teacher support (std dev)	4.10 (0.67)	3.90 (0.72)

*Knowledge*

Measures assessing knowledge of the nutritive value of food, the Canadian food guide, locally grown produce, and cooking procedures consisted of 8 to 10 items. Responses to food transformation, and international cuisine measures were dichotomized, where students responding correctly to at least half of the questions were considered to have knowledge acquisition.

*Attitude*

The first attitude measure assessed the perceived association between healthy eating and knowing how to cook. Response options for this 5-question scale (Cronbach’s Alpha 0.73) ranged from 1-4, with highest score indicating a higher perceived association. A second measure listed 10 food items typically disliked by children, where respondents indicated having tasted and having a liking or disliking for the item, or not having tasted it but being willing (or not willing) to do so. Positive attitudes towards food were denoted by greater numbers of food items that respondents reported liking or being willing to try. A third measure of attitude involved 3 items regarding the anticipation of negative peer reaction to a hypothetical situation involving uncommon or new foods.

*Experience*

One measure queried experience tasting new foods from a list of 10 food items that

are relatively uncommon or typically disliked by children. The second measure included seven items asking about experience with food preparation at home. Scores ranged from 1 (never having participated) to 3 (participating regularly).

*Capacity*

This measure included seven items with a 4-point Likert response scale ranging from incapable to completely capable. The distribution of this outcome was highly skewed (the majority of respondents reported a higher level of capacity). Responses were dichotomized for analysis on the basis of whether scores were below the sample median (corresponding to lower capacity) or above (corresponding to higher capacity).

*Parental and/or family participation in school*

Respondents reported whether or not they had a family member or guardian who ever participated in any school activities in the past. Since the rate of participation as “often” was very low, this category was collapsed with “sometimes”, to provide a dichotomized measure of parental participation.

*Covariates*

Having arrived at the school during 2003/04 or 2004/05 was considered new to the school. Sibling participation in program was assessed by asking about the school

**TABLE II**  
**Knowledge Measures Controlled for Sex, Newness to the School, Presence of Sibling Participating in Program, and Family and/or Parental Participation in School**

Dependent Variables	Grade 5 Participants	Grade 6 Non-participants	Test Statistic
1. Knowledge of nutritive value of food Mean number of correct responses (out of 10)	3.4	2.8	$\chi^2=11.4$ (p<0.001)
- Added effect of parental participation in school† Mean number of correct responses (out of 10)	4.1	3.3	$\chi^2=11.0$ (p<0.001)
2. Knowledge of Canadian food guide Mean number of correct responses (out of 10)	5.8	5.8	$\chi^2=0.72$ (NS)
- Added effect of parental participation in school† Mean number of correct responses (out of 10)	6.3	6.3	$\chi^2=5.0$ (p<0.05)
3. Knowledge of locally grown produce Mean number of correct responses (out of 10)	6.4	6.4	$\chi^2=0.1$ (NS)
4. Knowledge of food transformation process Proportion answering correctly	47.5	34.0	OR 2.1; 1.4-3.2* (p<0.001)
- Added effect of parental participation in school† Proportion responding correctly	61.0	43.0	OR 1.7; 1.1-2.7* (p<0.01)
5. Knowledge of international cuisine Proportion answering correctly	11.3	11.3	OR 1.3; 0.7-2.3* (NS)
- Added effect of parental participation in school† Proportion answering correctly	19.8	19.8	OR 1.9; 1.1-3.4* (p<0.05)
6. Knowledge of cooking procedures Mean number of correct responses (out of 8)	4.2	2.8	$\chi^2=33.8$ (p<0.001)
- Added effect of being a girl‡ Mean number of correct responses (out of 8)	5.1	3.7	$\chi^2=15.7$ (p<0.001)

\* Odds ratio (95% Confidence Interval)

† Responding “no” to parent participation as reference category (0), model tested for added effect of parental participation as “sometimes” or “often”

‡ Boy reference category (0), model tested added effect of being girl (1)

**TABLE III**  
**Attitude Measures Controlled for Sex, Newness to the School, Presence of Sibling Participating in Program, and Parental Participation in School Activities**

Dependent Variables	Grade 5 Participants	Grade 6 Non-participants	Test Statistic Chi-square OR OR (95% CI)*
1. Belief that knowing how to cook is associated with healthy eating, from low (1) to high (4) Mean response	3.1	2.9	$\chi^2=7.3$ (p<0.01)
- Added effect of being a girl‡ Mean response	3.3	3.1	$\chi^2=10.9$ (p<0.001)
2. Either liking or being open to tasting less common foods, from low (0) to high (10) Mean response	6.2	5.6	$\chi^2=7.3$ (p<0.01)
3. Perceiving classmates as likely to have a negative reaction to less common or strange foods Proportion having negative perception	64.9	64.9	OR 0.79; 0.47-1.3* (NS)

\* OR (95% CI)

‡ Boy reference category (0), model tested added effect of being girl (1)

attended and grade level of sibling(s). Gender was also tested as a covariate.

**Analysis**

Analysis began by assessing the impact of the program upon each of the knowledge, attitude, capacity and experience measures, and then upon parental and/or family participation in school activities. Analyses controlled for dichotomized covariates, with newness to the school, presence of siblings in the same school, and being a boy as reference categories. The first set of analyses also controlled for gender parental and/or family participation in school activities and tested for moderating effects.

Linear and logistic regression models were used to assess the association between

the program and each of the impact measures while controlling for relevant covariates. For linear regression models, results indicate the mean level of knowledge for program participants and non-participants, and where significant, the additional effect of covariate(s). Logistic models provide the improved odds (if any) of answering the question(s) correctly among program participants relative to non-participants.

**RESULTS**

Survey participant characteristics are given in Table I. Refusal rates were slightly lower among program participants than non-participants (p=0.06). The proportion of families having attended school activities

“sometimes” was significantly higher (p=0.043) and the proportion of families having “never” attended school activities was significantly lower (p=0.047) among program participants than non-participants.

Participants had greater knowledge than non-participants of the nutritional content of food, food transformation, and cooking procedures. There were no differences in knowledge of the Canadian food guide, local food produce, or international cuisine (Table II). Family and/or parental participation in school activities along with gender appeared as significant covariates.

Two out of three attitudes related to healthy eating differed according to program participation (Table III). Both girls and program participants reported to a

**TABLE IV**  
**Experience and Capacity Measures Controlled for Sex, Newness to the School, Presence of Sibling Participating in Program, and Parental Participation in School Activities**

Dependent Variables	Grade 5 Participants	Grade 6 Non-participants	Test Statistic Chi-square OR OR (95% CI)*
1. Experience with less common foods, from low (0) to high (10) <i>Mean response</i>	6.2	4.9	$\chi^2=26.2$ ( $p<0.001$ )
- Added effect of parental participation in school† <i>Mean response</i>	7.15	6.23	$\chi^2= 7.6$ ( $p<0.01$ )
2. Experience cooking at home, from none (1) to often (3) <i>Mean response</i>	2.34	2.34	$\chi^2=0.38$ (NS)
- Added effect of parental participation in school† <i>Mean response</i>	2.60	2.60	$\chi^2=6.5$ ( $p<0.05$ )
- Added effect of being a girl‡ <i>Mean response</i>	2.68	2.68	$\chi^2=13.4$ ( $p<0.001$ )
3. Perceived capacity to cook <i>Proportion with perceived capacity</i>	49.9	33.4	OR 1.99; 1.30-3.04* ( $p<0.001$ )
- Added effect of being a girl‡ <i>Proportion with perceived capacity</i>	62.3	45.4	OR 1.66; 1.09-2.54* ( $p<0.01$ )
- Added effect of parental participation in school† <i>Proportion with perceived capacity</i>	63.0	46.2	OR 1.71; 1.08-2.73* ( $p<0.05$ )

\* OR (95% CI)

† Responding “no” to parent participation as reference category (0), model tested for added effect of parental participation as “sometimes” or “often”

‡ Boy reference category (0), model tested added effect of being girl (1)

higher degree than boys and non-participants that knowing how to cook was an important component of healthful eating. Program participants also indicated a greater readiness to taste new foods or to like a set of less typical foods.

Program participants had greater experience in tasting less common foods but they did not report more experience with food preparation at home. Reported level of capacity to prepare food was highest for program participants compared to non-participants (Table IV). Family and/or parental participation along with gender appeared as significant covariates.

Last, the program was associated with family and/or parental participation in school activities. The likelihood of family participation in school activities was 2.8 times higher for families of program participants compared to those of non-participants (95% CI 1.7-4.4,  $p<0.0001$ ). Having arrived at the school within the present or previous school year significantly decreased the probability of parental participation (OR 0.3; 95% CI 0.2-0.6,  $p<0.001$ ). Newness to school did not modify the effect of the program on family and/or parental participation.

**DISCUSSION**

This study aimed to identify intermediate nutrition intervention program impacts defined in terms of 1) nutritional and cooking knowledge, attitude, experience and capacity, as well as 2) family and/or

parental participation in school activities. Self-reported results reveal program participation to be associated with: student knowledge of the nutrient content of food, the processes through which food is transformed from a raw form into that suitable for consumption, and cooking procedures; more positive attitudes and experiences with tasting of new or less common foods, and a greater perceived cooking capacity; and family participation in school activities.

The lack of program association with knowledge of local food products and international cuisine might be explained by the fact that this information was the subject of just one workshop, whereas information regarding nutrient content of food and cooking procedure was transmitted during each workshop, and thus repeated throughout the school year. The lack of association between long-term participation in the program and knowledge of food groups may be seen as surprising, however.

Contrasted with school-based interventions which develop from theory,<sup>27</sup> this intervention is rooted in community-based solutions to local problems where professional dieticians were hired to implement nutrition education in collaboration with community and educational stakeholders.<sup>10</sup> The PC-PR program, similar to theory-driven programs, has demonstrated positive influence on knowledge, attitude and capacity indicators.<sup>27</sup> However, results from this study are

unique in showing positive influence upon parental participation and achieving stable presence in schools (i.e., six years at the time of the survey).

The validity of the results assumes students in the participating classes were equally exposed to the program. We did not measure individual absenteeism. Validity also assumes reasonable comparability between students exposed versus those not exposed to the program. In this respect, our results are strengthened by having a comparison group of children (grade 6) from within the same schools as participating students (grade 5), however, this also introduced differential with respect to the intellectual maturity. For these reasons, program effects may be underestimated, most notably in domains associated with maturity (i.e., cooking experience, perceived capacity for cooking, awareness of local food produce).

The student participation rate and parental participation in school activities were slightly higher among grade 5 students and we did not account for multiple comparisons by adjusting p-values within the classes of impact measures. These factors may have overestimated the impact of apparent effects. Further, the outcomes of interest ideally would have been measured prior to and then following exposure to the program in order to assure that the observed effects are attributable to the program. The structure of the intervention and politics regarding its evaluation did not, however, allow for constructing a pretest.

**Appendix A**  
**Nutrition Questionnaire**

**Background Questions (co-variates)**

- Are you girl or a boy?  Boy  Girl
- What grade are you in at school?  5th Grade  6th Grade
- What grade were you in when you began at this school?  
 Kindergarten  Fourth Grade  
 First Grade  Fifth Grade  
 Second Grade  Sixth Grade  
 Third Grade
- Do you have any brothers or sisters in this school?  
 Yes —> How many? \_\_\_\_\_  
 What grade is he/she in? \_\_\_\_\_  
 No
- Has anyone from your family or a guardian ever come to your school to participate in an activity or a school trip with you?  
 Yes, often  
 Yes, sometimes  
 No

**Knowledge of Nutrition**

- I. Knowledge of nutritive value of food  
(One point per correct response; Maximum score 10, Minimum score 0)
- 1) Food can contain fibre, and some foods have more fibre than others. Which food has the most fibre?  
 cheese  white bread  
 peanut butter  olive oil  
 cabbage  I don't know
- 2) Food can contain vitamin C, and some foods have more vitamin C than others. Which food has the most vitamin C?  
 milk  white bread  
 peanut butter  squash  
 strawberries  I don't know
- 3) Food can contain calcium, and some foods have more calcium than others. Which food has the most calcium?  
 butter  white bread  
 squash  yogurt  
 cabbage  I don't know
- 4) Which food group contains the highest amount of vitamins A, B and C?  
 cereals  meat and substitutes  
 fruits and vegetables  other foods  
 milk products  I don't know
- 5) Is it true that some fats are better for your health than others?  
 Yes  It depends  
 No  I don't know
- 6) Can you name a fat that would be good for your health? (e.g., butter, margarine, Crisco shortening, olive oil)  
 \_\_\_\_\_
- 7) Does food that you buy quickly, ready prepared (i.e., 'fast food'), necessarily have to be bad for your health?  
 Yes  It depends  
 No  I don't know
- 8-10) Foods that are known to be bad for your health, can contain too much...  
 i) \_\_\_\_\_  
 ii) \_\_\_\_\_  
 iii) \_\_\_\_\_  
 I don't know

II. Knowledge of Canadian Food Guide  
(One point per correct response; Maximum score 10, Minimum score 0)

For each food item, name the food group to which it belongs:

- i. Pita bread  cereals  
 ii. Chick peas  meat and substitutes  
 iii. Melon  fruits and vegetables  
 iv. Cabbage  other foods  
 v. Tofu  milk products  
 vi. Zucchini  I don't know  
 vii. Donut  
 viii. Egg  
 ix. Rice  
 x. Cheese

III. Knowledge of locally grown produce  
(One point per correct response; Maximum score 10, Minimum score 0)

- 1) Circle all of the food items that are cultivated in Quebec.  
 i. cabbage  vi. soy bean  
 ii. apple  vii. corn  
 iii. carrot  viii. orange  
 iv. potato  ix. rice  
 v. banana  x. cauliflower

IV. Knowledge of cooking procedures  
(One point per correct response; Maximum score 8, Minimum score 0)

- Before you begin to cook, it is important to...  
 1. \_\_\_\_\_ and  
 2. \_\_\_\_\_ and  
 3. \_\_\_\_\_  
 I don't know
- When you cook, it is important to...  
 1. \_\_\_\_\_ and  
 2. \_\_\_\_\_ and  
 3. \_\_\_\_\_  
 I don't know
- After finishing to cook, it is important to...  
 1. \_\_\_\_\_ and  
 2. \_\_\_\_\_  
 I don't know

V. Knowledge of food transformation process  
(Two out of three responses correct = 1; less than two out of three responses correct = 0)

- 1) What makes some types of honey darker than others?  
 the type of flower  
 the type of bees  
 the time of the year  
 I don't know
- 2) Tofu is made from what kind of food?  
 soy beans  
 lentils  
 green peas  
 red kidney beans  
 I don't know
- 3) What does the word "pasteurized" mean?  
 boil a liquid to improve its taste  
 bring animals to the field so they can eat  
 boil a liquid in order to kill the bacteria  
 I don't know

VI. Knowledge of international cuisine  
(Two out of four responses correct = 1; less than two out of four responses correct = 0)

- 1) Traditionally in South-East Asia, the people eat...?  
 red meat and potatoes  
 pasta, tomato sauce and cheese  
 rice, fish, vegetables and fruit  
 I don't know
- 2) What is a curry?  
 a red spice  
 a brown spice  
 a mix of spices  
 a type of African food  
 I don't know
- 3) What do you need to do in order to prepare a rice paper for a spring roll?  
 boil it  
 soak it in warm water  
 cut it in little pieces  
 I don't know
- 4) In nature, in what form do we find cilantro, basil, and parsley?  
 flower  
 root  
 leaf  
 I don't know

**Attitude toward healthy eating**

- I. Attitude scale measuring belief that knowing how to cook is associated with healthy eating (4 items)
- 1) When I am an adult, it will be important for me to know how to cook so that I can eat healthy  completely agree  
 more or less agree  
 more or less disagree  
 completely disagree
- 2) To eat healthy, you have to know how to cook
- 3) People need to know how to cook in order to eat healthy
- 4) It is important to know how to cook to eat healthy
- 5) People who do not learn how to cook cannot eat healthy

...continues

**Appendix A, continued**  
**Nutrition Questionnaire**

II. Liking or being open to tasting less common foods  
(One point with; Yes, I have eaten this food OR No but Yes, I would like to; Maximum score 10, Minimum score 0)

Have you ever eaten the following foods:

- i. Cabbage  yes Like it?  Yes  No
- ii. Bok-choy cabbage  no
- iii. Squash  Like to try it?  Yes  No
- iv. Cantaloupe  I don't think so
- v. Goat cheese  Like to try it?  Yes  No
- vi. Chick peas
- vii. Soy beans
- viii. Tofu
- ix. Whole wheat pita bread
- x. Lentils

III. Perceived classmates' attitude toward less common or strange foods  
(Responding (1) or (2) = 1 for positive reaction; Responding (3) or (4) or (5) = 0 for negative reaction)

- 1) Imagine that one day you brought something to school that nobody in your class had ever seen before. What do you think would be the reaction of your classmates?
  - (1)  they wouldn't say anything
  - (2)  they would politely ask you what it was
  - (3)  they would impolitely ask you what it was
- 2) Imagine now that you were to bring a food that had a strange look. What do you think would be the reaction of your classmates?
  - (4)  they might laugh at you
  - (5)  they might say "yuck" or "disgusting"
- 3) Imagine now that you were to bring a food that had a strange smell. What do you think would be the reaction of your classmates?

**Experience with food**  
**Capacity with food preparation**

I. Experience with less common foods  
(Responding Yes = 1; Responding No or I don't think so = 0)

- Have you ever eaten the following foods:
- i. Cabbage  Yes  No
  - ii. Bok-choy cabbage  I don't think so
  - iii. Squash
  - iv. Cantaloupe
  - v. Goat cheese
  - vi. Chick peas
  - vii. Soy beans
  - viii. Tofu
  - ix. Whole wheat pita bread
  - x. Lentils

II. Experience cooking at home (7 items)  
(Responding 'Yes, often' = 3; Responding 'Yes, from time to time' = 2; Responding 'No' = 1)

- 1) At home, have you ever prepared something for yourself to eat?  Yes, often  Yes, from time to time  No
- 2) At home, have you ever prepared something for somebody else to eat, such as your parents, your friends, your family?
- 3) At home, have you ever participated in the preparation of a meal?
- 4) At home, have you ever participated in the preparation of your own breakfast?
- 5) At home, have you ever participated in the preparation of your own lunch?
- 6) At home, have you ever participated in the preparation of your own dinner?
- 7) At home, have you ever participated in the preparation of something following a recipe?

III. Perceived capacity to cook (7 items)  
(Mean of responses falling below the sample median = 0; Mean of responses falling above the sample median = 1)

- 1) Do you feel capable to follow a recipe from start to finish?  very capable  more or less capable  not very capable  not at all capable
- 2) Do you feel capable to cut tomatoes into cubes?
- 3) Do you feel capable to cut an onion in slices?
- 4) Do you feel capable to measure a cup of flour?
- 5) Do you feel capable to measure something with a tablespoon?
- 6) Do you feel capable to choose the best cooking utensil to grate a carrot?
- 7) Do you feel capable to choose the best cooking utensil to peel an apple?

**CONCLUSIONS**

The PC-PR nutrition intervention suggests some moderate effects on cooking and nutritional knowledge; culinary experience; capacity to cook; attitude toward cooking, healthy eating, tasting and enjoying foods from which children typically abstain. Results also suggest some effect on parental participation with school activities. Given that parental participation was found to offer a relative advantage to participants, the potential benefits of a program encouraging parental participation, such as PC-PR, is noteworthy. Although design limitations must be considered when interpreting the results, this study has identified potential program mechanisms through which future evaluations of nutrition interventions similar to PC-PR could take place.

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## RÉSUMÉ

**Objectifs :** Cette étude vise à produire une évaluation intermédiaire des effets de l'intervention nutritionnelle « Petits cuisinots – parents en réseaux »; elle est fondée sur un ensemble de mesures des effets du programme, dont 1) les connaissances, les attitudes, les habiletés et l'expérience à l'égard de la nutrition, de l'alimentation et de l'art culinaire chez les enfants et 2) la participation parentale et/ou familiale à l'école.

**Participants :** Un total de 388 élèves de 5<sup>e</sup> année (participants) et de 6<sup>e</sup> année (non-participants).

**Lieu :** L'évaluation du programme nutritionnel a eu lieu dans les sept écoles primaires participantes. Les écoles étaient toutes situées dans des quartiers défavorisés de Montréal.

**Intervention :** Le volet « Petits cuisinots » est un atelier nutritionnel animé par des diététiciennes communautaires. Chacun des huit ateliers annuels présente un aliment particulier et un thème nutritionnel avec une recette pour faire l'expérience de cuisiner et de déguster ensemble. Les enseignantes participent à l'atelier et assurent la gestion de la classe et le soutien au programme. Le volet « Parents en réseaux » invite les parents à assister aux ateliers nutritionnels et offre des activités parentales et familiales additionnelles liées aux thèmes des ateliers nutritionnels (p. ex., repas collectifs ou visites chez des producteurs agricoles locaux).

**Résultats :** Le programme a eu certains effets sur la connaissance de la valeur nutritive, de la production et de la transformation des aliments; sur l'attitude et l'expérience quant au fait de goûter des aliments nouveaux ou moins connus; et sur la perception de la capacité à cuisiner. Les familles dont les enfants ont participé au programme ont eu un niveau de participation plus élevé aux activités scolaires que les familles des élèves qui n'ont pas participé au programme.

**Conclusions :** Notre évaluation montre certains effets potentiels du programme sur diverses mesures intermédiaires des effets et met ainsi en évidence une intervention prometteuse en vue de promouvoir les capacités nutritionnelles.

**Mots clés :** intervention nutritionnelle; évaluation des effets; santé scolaire; enfants et jeunes



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## APPENDIX B

Bisset, S., Paquette, M., Bedard, J. Introducing *Petits cuistot – parents en reseau*  
(Little Cooks – Parental Networks) a multifaceted nutrition  
intervention for primary school children.  
In preparation to be submitted to Canadian Journal of Dietetics



**Introducing *Petits cuistot – parents en réseau* (Little Cooks – Parental Networks)  
a multifaceted nutrition intervention for primary school children**

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**Approval to collect data for this study was obtained from the University of Montreal  
Ethical Review Committee in the Faculty of Medicine (CERFM 59(04) 4#139**

## INTRODUCTION

Integrating health education with educational interests is an important feature of the next generation of school based health promotion programming (1-3). School based initiatives aiming to change health behaviours among youth have been challenged to meet ambitious goals within a limited time frame (4). Nutrition education program planners have responded to this challenge by incorporating food and nutrition concepts into core subject areas and through the active involvement of school children, teachers and parents (5-7). These newer approaches to nutrition education are premised on theory suggesting that knowledge is actively constructed from experience and that effective messages are transmitted through a variety of means and approaches to learning (8-9). This article describes a novel nutrition education intervention which evolved from community based interests in 1989 (10), and is now incorporating educational interests in order to integrate more fully into the school setting with the aim of sustainability.

## PROGRAM

The program, *Petits cuistots - parents en réseaux* (translated as *Little Cooks – Parental Networks*) is targeted at elementary school children and their families living in disadvantaged Montreal neighborhoods in Quebec, Canada. The *Little Cooks* component includes teacher and parent assisted monthly nutrition workshops, created and animated by dietitians offering concrete experiences with food, through food preparation and tasting activities. Nutrition workshops feature rotating themes, which expose students to new or alternative foods (e.g. tofu, chick peas), ecological issues (e.g. choosing local food produce), international cuisine (e.g. Indian, Mexican), food types (e.g. berries, cereals, cheese) and health issues (e.g. fast food, satiety, hydration). Each workshop includes; 1)

didactic knowledge transmission on topics such as food transformation, food types, nutrition and health; 2) hands-on recipe completion using a cooperative learning approach; and 3) tasting of the finished recipe with samples to be taken home. In-class preparatory exercises are proposed to teachers in order to increase the students level of motivation and implication during the workshop. The second component (*Parental Networks*) is organized by community development workers and aims to support the development of mutual support networks through parents' active involvement in the school. Parents are invited to participate with their child during the nutrition workshops and as well to attend collective dinners and family visits to local food producers (e.g. local squash producer, cheese production, maple syrup, apple picking). The ultimate objective of the PC-PR initiative is to promote healthy eating behaviors and attitudes through an increased capacity to transform raw foods into nutritious meals and also to promote citizenship and a sense of social conscience among young school children and their families.

The Preschool and Elementary Quebec Education Program (QEP) underwent an important reformulation during the last part of the 20<sup>th</sup> century. Documentation on this subject can be accessed through the Quebec Minister of Education website at

[www.mels.gouv.qc.ca/dfgj/dp/programme\\_de\\_formation/primaire/educprg2001h.htm](http://www.mels.gouv.qc.ca/dfgj/dp/programme_de_formation/primaire/educprg2001h.htm)).

The new QEP or 'reform' is identified as a response to the socio-cultural trends, including: internalization, globalization, information explosion, rapid technological development and the growing complexity of social life. Beyond the subject specific focus of the educational program, the reform identifies two new areas of concentration, cross curricular competencies and broad areas of learning. Cross-curricular competencies

are generic in nature and refer to intellectual, methodological, personal and social and communication-related competencies which are used in various subject areas. Broad areas of learning aim to bridge the boundaries between the multiple realities of the child, including the school, home and community. Broad areas of learning aim to enable students to look critically at their personal, social and cultural environment.

### **PROGRAM IMPLEMENTATION**

Interviews with grade 4 and grade 5 teachers (n=19) were conducted with the purpose of obtaining descriptions of the nutrition intervention from the perspective of the teachers involved. Teachers were asked, for example, to discuss their interest in the program and if the program fit into their educational objectives. Approval to collect this data was obtained from the University of Montreal Ethical Review Committee in the Faculty of Medicine.

Teachers revealed interests in the nutrition program which went beyond a health education mandate to correspond with their own needs to deliver an educational program and meet educational mandates (Table One). With the exception of one teacher who found no interest in the program, all teachers found the program of interest to their educational objectives by using one or more of the nutrition program elements to complement curricular material.

Teachers used the program as a tool to develop and test class understanding of math and language. Some teachers surveyed the likes and dislikes of the last recipe for statistical exercises and others used recipes for concrete examples of fractions. The

recipe was also found to introduce new vocabulary and illustrate the use of concise sentence structure.

Most teachers viewed the program as an opportunity to build personal and social competencies. In the respect the PC-PR program encourages students to develop and express their own likes and dislikes with respect to food and to learn about the cultural and religious significance of various international cuisines. Additionally, the nutrition workshops require students to complete individual tasks for the overall achievement of the group. Several teachers reported using the workshop to evaluate students collective work methods.

Interviews consistently identified the program as fitting within broader areas of learning, with regard to health and well-being. Teachers recognized the need for teaching children about healthy eating as integral to developing the child as a responsible, autonomous actor in today's society. Cooking abilities and consumer awareness toward diet were identified as essential components to the core education of the child, and for which the school should foster. Within this area, others program elements were identified, including citizenship and community life, media literacy, environmental awareness and consumer rights and responsibilities, and personal and career planning.

Table 1. Illustrative Quotations (translated from French)

<b>Component of Quebec Education Program</b>	<b>Quotation taken from teacher interview</b>
Cross-Curricular competencies (Social and personal competencies)	<p><i>“This is a group activity. Each child has his/her own role and must integrate into the activity in cooperation. To succeed as a group, one must respect his/her role and those of the others.”</i></p> <p><i>“There is this kind of chemistry that passes between the children; they accept each other much more...it is not just healthy eating, but also learning about others”</i></p>
Subject Specific	<i>“At the start, I said to myself, ok, it is 1.5 hours that I will lose per</i>

Learning Areas (Mathematics, Language skills, Social Sciences);	<p><i>month...in little time, I saw a lot of interest, many links with what we see in class, at the academic level, with what we see in the nutrition workshops, the fractions, the French, the vocabulary”</i></p> <p><i>“We learn, like with the cabbage, this vegetable has a history in our society, we learn the importance of food, its place in our civilization, our customs, there is an interaction with food and who we are”</i></p>
Broad Areas of Learning (Health and Wellbeing, Environmental Awareness and Consumer Rights, Personal and Career Planning)	<p><i>“I asked her to speak about her profession as a dietician. What you study and for how long. This was part of our orientation development of the school”</i></p> <p><i>“For me, teaching children to become responsible citizens in society is part of my work as a teacher...this program corresponds to my work in this way.”</i></p>

## CONCLUSION

Within a context of educational reform which emphasizes child development, nutrition based interventions described by PC-PR program provide a good example of how health promotion programming can integrate with educational mandates. This approach contrasts traditional approaches to health promotion in schools which have been described as “add on extras” (10) susceptible to being cut out. The nutrition intervention PC-PR program overlaps with the regional educational program in a manner which goes beyond nutrition education.

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APPENDIX C

Ethical Approval letters  
Consent forms



Le 24 janvier, 2005

J P & V B

Directrice et Directrice adjoint de l'école PB  
555, rue des Seigneurs  
Montréal, Québec  
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Sujet : *Évaluation de la mise en oeuvre du projet Petits cuistots - parents en réseaux :  
Les représentations du personnel enseignant, l'intérêt des élèves pour la nutrition et leur perception  
du climat psychosocial de l'école.*

Réalisé par Sherri Bisset, candidate au doctorat en santé publique, Université de Montréal

Madame Pethel & Boucher,

L'intervention en nutrition du projet *Petits cuistots – Parents en réseaux* (PC-PR) se déroule depuis maintenant six ans dans huit écoles primaires de la CSDM, incluant l'École De la Petite-Bourgogne. Cette étude fait partie d'une recherche évaluative du projet PC-PR dans les écoles participantes. L'objectif de cette étude est d'évaluer le niveau d'implantation du projet en considérant les pratiques du personnel enseignant et d'estimer les facteurs qui pourraient influencer ces pratiques et y être associés. Cette étude évaluative convient à la phase actuelle d'implantation du projet et permettra de fournir aux parties intéressées l'information requise pour comprendre et anticiper 1) les variations dans l'implantation et les retombées du projet, 2) la façon de déployer le projet dans d'autres écoles et 3) le potentiel de viabilité du projet.

L'étude comprend trois volets. Un premier volet consiste à évaluer le niveau de mise en œuvre du projet en considérant les pratiques des 30 enseignantes et enseignants des classes régulières de 4<sup>ème</sup> et 5<sup>ème</sup> année, dans le cadre du projet. Un deuxième volet de l'étude vise à déterminer si les perceptions du projet exprimées par le personnel enseignant et les intervenantes du projet PC-PR influencent le niveau de mise en œuvre. Le troisième volet de cette recherche consiste à étudier si le projet et son niveau d'implantation sont associés 1) à la motivation des élèves aux apprentissages nutritionnels et à 2) leur perception du climat psychosocial de l'école. Ce dernier volet inclura approximativement 300 élèves du 3<sup>ème</sup> cycle du primaire; 150 de 5<sup>ème</sup> année qui sont des participants au projet PC-PR (groupe participant) et 150 de 6<sup>ème</sup> année qui sont des non-participants (groupe témoin). Les deux premiers volets seront complétés durant la période de janvier à juin 2005 et le troisième implique une enquête par questionnaire auprès des élèves de 6<sup>ème</sup> année en mars 2005 et la même démarche auprès des élèves qui seront en 6<sup>ème</sup> année en mars 2006 (actuellement en 5<sup>ème</sup> année).



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La collecte des données comprend la réalisation d'entrevues avec les enseignantes et les enseignants des classes régulières de 4<sup>e</sup> et 5<sup>e</sup> année du primaire qui participent actuellement au projet PC-PR. Les entrevues se réaliseront entre janvier et juin 2005. Deux entrevues d'une durée de 10 minutes et une entrevue d'une durée de 45 minutes seront demandées aux enseignantes et enseignants concernés. Les entrevues seront réalisées au moment et à l'endroit qui conviennent à la personne interviewée. Nous proposons que les entrevues se fassent pendant un atelier de cuisine-nutrition. De plus, nous solliciterons leur consentement pour faire trois périodes d'observation dans les classes régulières de 4<sup>e</sup> et 5<sup>e</sup> année qui participent aux activités de PC-PR. Ces observations auraient lieu 1) durant deux ateliers de nutrition du projet PC-PR et 2) durant une activité préparatoire à l'atelier qui se déroule en classe.

Enfin, cette étude comprend une enquête auprès des élèves de 6<sup>e</sup> année. Environ 45 minutes seraient nécessaires aux élèves pour remplir le questionnaire, durant les heures de classe. Le questionnaire comprend quatre parties : 1) la motivation des élèves aux apprentissages nutritionnels ; 2) l'information générale sur l'âge, le sexe, le nombre d'années depuis qu'ils fréquentent votre école ; 3) leur perception du climat psychosocial de l'école ; 4) les ressources de la famille et leurs perceptions à ce sujet. La majeure partie du questionnaire est tirée d'une enquête internationale de l'Organisation mondiale de la santé : « *Les comportements de santé des jeunes d'âge scolaire 2002* » ce qui offre la possibilité de comparer les résultats de l'étude avec des données au plan national et international. Nous demanderons à tous les élèves présents dont les parents auront donné leur consentement, et qui ont eux-mêmes accepté de participer, de remplir le questionnaire. Pour les autres élèves dont les parents n'ont pas donné leur accord ou qui ont eux-mêmes refusé, nous aurons une activité à compléter individuellement et qui leur sera laissée à eux ou à l'enseignant(e) de la classe. La situation en classe ressemblera à celle qui existe durant un examen (i.e. les élèves n'auront pas la permission de parler ou de regarder les réponses des autres).

Cette étude est conduite par une étudiante au doctorat supervisée par Dr Louise Potvin de la Chaire Approches Communautaires et inégalités de santé, ainsi que Dr Mark Daniel de la Chaire de recherche du Canada en biopsychologie et santé des populations. Une bourse des Instituts de recherche en santé du Canada attribuée à l'étudiante assure le financement principal de cette étude. Étant donné que l'étude proposée fait partie d'une évaluation plus générale du projet PC-PR, elle sera réalisée en partenariat avec les organismes associés à cette évaluation, notamment Les ateliers cinq épices, la Fondation Lucie et André Chagnon et la Table de concertation sur la faim et le développement social du Montréal métropolitain et la Commission scolaire de Montréal, qui est représentée par Madame Claire Pelletier, responsable des services alimentaires.

L'étude comprend trois volets. Un premier volet consiste à évaluer le niveau de mise en œuvre du projet en considérant les pratiques des nutritionnistes et d'environ 15 enseignant(e)s des classes de 4<sup>e</sup> et 5<sup>e</sup> année, dans les ateliers de cuisine-nutrition, en excluant les classes dites spéciales (e.g. comprenant des élèves qui ont des problèmes d'apprentissage). Un deuxième volet de l'étude vise à déterminer si les perceptions du projet exprimées par le personnel enseignant et les nutritionnistes du projet PC-PR influencent le niveau de mise en œuvre. Le troisième volet de cette recherche consiste à étudier si le projet et son niveau d'implantation sont associés chez les élèves 1) à leur goût d'adopter de saines habitudes alimentaires et 2) leur intérêt envers l'école (i.e. leur perception positive du climat de la classe). Ce dernier volet inclura approximativement 300 élèves du 3<sup>ème</sup> cycle du primaire; 150 de 5<sup>ème</sup> année qui sont des participants au projet PC-PR et 150 de 6<sup>ème</sup> année qui sont des non-participants.

### **Procédures**

Cette étude comprend la réalisation d'entrevues avec les enseignantes et les enseignants (approximative 15) des classes de 4<sup>e</sup> et 5<sup>e</sup> année du primaire (excluant des classes qui regroupent des élèves avec des difficultés d'apprentissage) qui participent actuellement au projet PC-PR. Les entrevues se réaliseront entre janvier et juin 2005. Deux entrevues d'une durée de 10 minutes et une entrevue d'une durée de 45 minutes sont requises. Les entrevues seront réalisées par Sherri Bisset, étudiante au doctorat, au moment et à l'endroit qui convient à la personne interviewée. Nous proposons que les entrevues se fassent pendant l'atelier de cuisine-nutrition. Les deux entrevues de 10 minutes posent des questions spécifiques sur l'activité préparatoire et l'entrevue de 45 minutes pose des questions plus générales sur l'intérêt du personnel enseignant pour le projet PC-PR. Je vous demanderai la permission de faire un enregistrement audio de cette dernière entrevue de 45 minutes. L'utilisation d'une enregistreuse permet d'assurer que l'information que vous avez fournie se reflète avec précision dans les informations traitées et que vos impressions soient bien comprises. Si à tout moment durant l'entrevue, vous n'êtes pas à l'aise avec l'enregistrement de vos propos, celui-ci sera interrompu. Dans ce cas, l'interviewer utilisera une feuille pour situer les propos recueillis et prendra des notes. À votre demande, nous vous communiquerons la transcription de votre entrevue pour relire vos propos et faire toute clarification ou correction.

Cette étude consiste aussi à faire des observations directement liées aux activités de PC-PR dans les classes de 4<sup>e</sup> et 5<sup>e</sup> année (excluant des classes qui regroupent des élèves avec des difficultés d'apprentissage). Ces observations auraient lieu 1) durant deux ateliers de nutrition du projet PC-PR et 2) durant une activité préparatoire à l'atelier, qui se déroule en classe. Les observations seront faites par l'étudiante au doctorat, Sherri Bisset. Les observations ciblent directement les pratiques et discours de l'enseignement et de la nutritionniste, et indirectement le comportement général de la classe. Les objectifs de ces observation sont de 1) décrire les échanges entre la nutritionniste et l'enseignant(e) aussi bien que, 2) leur façon à transmettre et d'intéresser les élèves au projet nutritionnel. Une grille d'observation sera utilisée pour guider l'observatrice et des notes peuvent être inscrites sur les feuilles de notation. Les observations seront accompagnées d'un enregistrement d'audio. À cet égard, je vous demanderais de porter un petit « microphone-cravate ». L'utilisation d'une enregistreuse

servira d'aide-mémoire et permettra de bien capter les échanges qui se passent pendant l'atelier. Si à tout moment, vous n'êtes pas à l'aise avec l'enregistrement, celui-ci sera interrompu.

Finalement, cette étude comprend une enquête auprès des élèves de 5<sup>e</sup> et 6<sup>e</sup> année. Environ 45 minutes seront nécessaires aux élèves pour remplir le questionnaire. Nous demanderons à tous les élèves présents dont les parents auront donné leur consentement, et qui ont eux-mêmes accepté de participer, de remplir le questionnaire. Pour les autres élèves dont les parents n'ont pas donné leur accord ou qui ont eux-mêmes refusé, nous aurons une activité à compléter individuellement et qui leur sera laissée à eux ou à l'enseignant(e) de la classe. La situation en classe ressemblera à celle qui existe durant un examen (i.e. les élèves n'auront pas la permission de parler ou de regarder les réponses des autres). Une étudiante de doctorat administrera le questionnaire en classe et fera lecture à haute voix des instructions aux élèves.

Nous demandons :

- 1) votre participation à deux entrevues de 10 minutes, et une entrevue de 45 minutes,
- 2) votre permission de faire l'observation durant deux ateliers de nutrition et durant une période d'activité préparatoire à un atelier dans votre classe,
- 3) votre accord pour prendre le temps requis (45 minutes) afin que les élèves remplissent un questionnaire en classe.

### **Avantages et bénéfices**

Il n'y a aucun avantage associé à votre participation. Au terme de cette étude, un résumé des entrevues, des séances d'observation ainsi que des questionnaires aux enfants, vous sera communiqué.

### **Risques et inconvénients**

Il n'y a aucun risque associé à votre participation. Cette évaluation est strictement liée au projet PC-PR et il ne s'agit d'aucune façon d'évaluer les performances des enseignant(e)s.

### **Confidentialité**

Toutes les informations recueillies seront strictement confidentielles et ne contiendront aucune information nominative permettant d'identifier des personnes. Les entrevues seront transcrites et toute information qui pourrait vous identifier sera retirée. Les bandes enregistrées de l'entrevue seront conservées sous clé à l'Université de Montréal et elles seront détruites à la fin de l'étude, en janvier 2006. Comme responsable principale de la collecte et de l'analyse des données, je serai la seule personne ayant accès aux transcriptions des entrevues. Toutes les mesures nécessaires seront prises afin d'assurer qu'aucune information tirée de l'entrevue et/ou de l'observation directe ne puisse être associée nommément à vous, à une classe ou à une personne en particulier. Sherri Bisset qui aura la responsabilité première de la collecte et de l'analyse des informations recueillies sera la seule personne ayant accès aux informations permettant de lier un score à une classe en particulier.

Il est possible qu'une citation tirée de votre entrevue et/ou d'une observation soit utilisée pour appuyer un point important. Toutefois, aucune mention ni de votre nom, ni du

nom de l'école où vous travaillez n'accompagnera la citation. De plus, ni l'identification de la classe, ni le nom des personnes (i.e. enseignant(e), nutritionniste, élève) d'où une citation provient ne seront mentionnés.

**Liberté de participation et liberté de retrait de l'étude**

Votre participation à cette étude est tout à fait volontaire. Vous être donc libre d'accepter ou de refuser d'y participer. Vous pouvez vous retirer de l'étude en tout temps, sur simple avis verbal. Vous avez le droit de mettre fin à votre participation durant une période d'observation et/ou refuser de répondre à une question, ou de vous retirer en tout temps, sans aucune conséquence en regard de votre rôle d'enseignant(e) ou de votre collaboration avec le projet PC-PR.

**Personnes-ressources**

Si vous avez des commentaires ou des préoccupations à communiquer ou si vous désirez des informations supplémentaires, vous pouvez communiquer avec Sherri Bisset 514-343-6111 poste 1-4553. Vous pouvez également communiquer avec le Bureau de l'ombudsman de l'Université de Montréal au 514-343-2100 pour obtenir des renseignements éthiques ou formuler des commentaires.

**Adhésion au projet et signatures**

J'ai pris connaissance de la description de l'étude présentée ci-dessus. J'ai posé des questions à ce sujet et je considère avoir reçu une information complète. Je comprends que je peux refuser de participer ou retirer ma participation à cette étude à tout moment sans aucune conséquence sur mon emploi actuel ou futur ou sur mon implication avec le projet PC-PR. Je comprends également que toute information nominative me concernant sera gardée strictement confidentielle. Je soussigné(e) accepte de participer à cette étude en accordant deux entrevues de 10 minutes et une entrevue de 45 minutes, en donnant ma permission pour l'observation durant deux ateliers de nutrition et durant une période d'activité préparatoire dans ma classe, en accordant le temps requis (45 minutes) pour que les élèves de ma classe répondent au questionnaire aux élèves.

\_\_\_\_\_  
Nom du/de la participant(e)

\_\_\_\_\_  
Signature du/de la participant(e)

\_\_\_\_\_  
Date

Je certifie a) avoir expliqué au signataire les termes du présent formulaire de consentement; b) lui avoir clairement indiqué qu'il reste à tout moment libre de mettre un terme à sa participation à la présente recherche

\_\_\_\_\_  
Nom du Chercheur

\_\_\_\_\_  
Signature du Chercheur

\_\_\_\_\_  
Date

Espérant que vous recevrez favorablement cette demande de collecte d'informations concernant la mise en œuvre du projet Petits cuistots Parents en réseaux dans votre école, nous vous remercions à l'avance de votre collaboration.

Veillez recevoir, Madames, l'expression de nos sentiments les meilleurs.

---

Dr Louise Potvin  
Titulaire de la Chaire Approches  
Communautaires et inégalités de  
Santé de l'Université de Montréal  
Tel : 514-299-6736

[REDACTED]  
Tel : 514-343-6142

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Sherri Bisset, MSc  
Étudiante au doctorat en santé publique

[REDACTED]

**Consentement de la nutritionniste à participer à l'étude :**

*Évaluation de la mise en oeuvre du projet Petits cuistots - parents en réseaux :  
Les représentations du personnel enseignant, l'intérêt des élèves pour la nutrition  
et leur perception du climat psychosocial de l'école*

Sherri Bisset, candidate au doctorat en santé publique, Université de Montréal

Louise Potvin, directrice de recherche

**Entrevues individuelles, observations d'atelier de nutrition**

**Nous vous invitons à bien lire ce formulaire et à poser des questions  
avant d'y apposer votre signature.**

**Description du projet**

L'intervention en nutrition du projet *Petits cuistots – Parents en réseaux* (PC-PR) se déroule depuis maintenant six ans dans huit écoles primaires de la CSDM. Cette étude fait partie d'une recherche évaluative du projet PC-PR dans les écoles participantes. L'objectif de cette étude est 1) d'évaluer le niveau d'implantation du projet en considérant les pratiques du personnel enseignant et des nutritionniste pendant l'atelier nutrition; 2) d'estimer les facteurs qui pourraient influencer ces pratiques et y être associés; et 3) de revoir le contenu des ateliers en lien avec le *Programme de formation de l'école québécoise*. Cette étude évaluative convient à la phase actuelle d'implantation du projet et permettra de fournir aux parties intéressées l'information requise pour comprendre et anticiper 1) les variations dans l'implantation et les retombées du projet, 2) la façon de déployer le projet dans d'autres écoles et 3) le potentiel de viabilité du projet.

L'étude comprend trois volets. Un premier volet consiste à évaluer le niveau de mise en œuvre du projet en considérant les pratiques des nutritionnistes et d'environ 15 enseignant(e)s des classes de 4<sup>e</sup> et 5<sup>e</sup> année, dans les ateliers de cuisine-nutrition, en excluant les classes dites spéciales (e.g. comprenant des élèves qui ont des problèmes d'apprentissage). Un deuxième volet de l'étude vise à déterminer si les perceptions du projet exprimées par le personnel enseignant et les intervenantes du projet PC-PR influencent le niveau de mise en œuvre. Le troisième volet de cette recherche consiste à étudier si le projet et son niveau d'implantation sont associés 1) à la motivation des élèves aux apprentissages nutritionnels et à 2) leur perception du climat psychosocial de l'école. Ce dernier volet inclura approximativement 300 élèves du 3<sup>ème</sup> cycle du primaire; 150 de 5<sup>ème</sup> année qui sont des participants au projet PC-PR (groupe participant) et 150 de 6<sup>ème</sup> année qui sont des non-participants (groupe témoin).



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Cette étude est conduite par une étudiante au doctorat supervisée par Dr Louise Potvin de la Chaire Approches Communautaires et inégalités de santé, ainsi que Dr Mark Daniel de la Chaire de recherche du Canada en biopsychologie et santé des populations. Une bourse des Instituts de recherche en santé du Canada attribuée à l'étudiante assure le financement principal de cette étude. Étant donné que l'étude proposée fait partie d'une évaluation plus générale du projet PC-PR, elle sera réalisée en partenariat avec les organismes associés à cette évaluation, notamment Les ateliers cinq épices, la Commission scolaire de Montréal, la Fondation Lucie et André Chagnon et la Table de concertation sur la faim et le développement social du Montréal métropolitain.

## **Procédures**

Cette étude comprend la réalisation d'entrevues avec les nutritionnistes. Les entrevues se réaliseront entre janvier et juin 2005. Une entrevue d'une durée de 45 minutes est requise. L'entrevue sera réalisée par Sherri Bisset, étudiante au doctorat, au moment et à l'endroit qui convient à la personne interviewée. L'entrevue pose des questions générales sur le projet PC-PR. Je vous demanderai la permission de faire un enregistrement audio de cette entrevue. L'utilisation d'une enregistreuse permet d'assurer que l'information que vous avez fournie se reflète avec précision dans les informations traitées et que vos impressions soient bien comprises. Si à tout moment durant l'entrevue, vous n'êtes pas à l'aise avec l'enregistrement de vos propos, celui-ci sera interrompu. Dans ce cas, l'interviewer utilisera une feuille pour situer les propos recueillis et prendra des notes. À votre demande, nous vous communiquerons la transcription de votre entrevue pour relire vos propos et faire toute clarification ou correction.

Cette étude consiste aussi à faire des observations directement liée aux activités de PC-PR dans les classes de 4<sup>e</sup> et 5<sup>e</sup> année (excluant des classes qui cible les élèves avec difficulté en apprentissage). Ces observations auraient lieu 1) durant deux ateliers de nutrition du projet PC-PR et 2) durant une activité préparatoire à l'atelier qui se déroule en classe. Les observations seront faites par l'étudiante au doctorat, Sherri Bisset. Les observations cible directement au pratiques et discours de l'enseignement et nutritionniste, et indirectement le comportement générale de la classe. Les buts des observation sont de 1) décrire les échanges entre la nutritionniste et l'enseignante aussi bien que, 2) leur façon transmettre où connecter la programme nutritionnelle aux élèves (leur façon d'intéressant les élèves aux programme). Une grille d'observation sera utilisée pour guider l'observatrice et des notes peuvent être inscrites sur les feuilles de notation. Les observations seront accompagner avec une enregistrement d'audio. En cette regard, je vous demanderai d'attachée un petit 'microphone-cravate'. L'utilisation d'une enregistreuse servira d'aide-mémoire et de bien capturé les discours qui passe pendant l'atelier. Si à tout moment, vous n'êtes pas à l'aise avec l'enregistrement, celui-ci sera interrompu.

Nous demandons :

- 1) votre participation à une entrevue de 45 minutes,
- 2) votre permission de faire l'observation durant deux ateliers de nutrition

## **Avantages et bénéfices**



Il n'y a aucun avantage associé à votre participation. Au terme de cette étude, un résumé des entrevues, des séances d'observation ainsi que des questionnaires aux enfants, vous sera communiqué.

### **Risques et inconvénients**

Il n'y a aucun risque associé à votre participation.

### **Confidentialité**

Toutes les informations recueillies seront strictement confidentielles et ne contiendront aucune information nominative permettant d'identifier des personnes. Les entrevues seront transcrites et toute information qui pourrait vous identifier sera retirée. Les bandes enregistrées de l'entrevue seront conservées sous clé à l'Université de Montréal et elles seront détruites à la fin de l'étude, en janvier 2006. Comme responsable principale de la collecte et de l'analyse des données, je serai la seule personne ayant accès aux transcriptions des entrevues. Toutes les mesures nécessaires seront prises afin d'assurer qu'aucune information tirée de l'entrevue et/ou de l'observation directe ne puisse être associée nommément à vous, à une classe ou à une personne en particulier. Sherri Bisset qui aura la responsabilité première de la collecte et de l'analyse des informations recueillies sera la seule personne ayant accès aux informations permettant de lier un score à une classe en particulier.

Il est possible qu'une citation tirée de votre entrevue et/ou d'une observation soit utilisée pour appuyer un point important. Toutefois, aucune mention ni de votre nom, ni du nom de l'école où vous travaillez n'accompagnera la citation. De plus, ni l'identification de la classe, ni le nom des personnes (i.e. enseignant, nutritionniste, étudiant) d'où une citation provient ne seront mentionnés.

### **Liberté de participation et liberté de retrait de l'étude**

Votre participation à cette étude est tout à fait volontaire. Vous être donc libre d'accepter ou de refuser d'y participer. Vous pouvez vous retirer de l'étude en tout temps, sur simple avis verbal. Vous avez le droit de mettre fin à votre participation durant une période d'observation et/ou refuser de répondre à une question, ou de vous retirer en tout temps, sans aucune conséquence en regard de votre emploi avec le projet PC-PR.

### **Personnes-ressources**

Si vous avez des commentaires ou des préoccupations à communiquer ou si vous désirez des informations supplémentaires, vous pouvez communiquer avec Sherri Bisset 514-343-6111 poste 1-4553. Vous pouvez également communiquer avec le Bureau de l'ombudsman de l'Université de Montréal au 514-343-2100 pour obtenir des renseignements éthiques ou formuler des commentaires.

### **Adhésion au projet et signatures**

J'ai pris connaissance de la description de l'étude présentée ci-dessus. J'ai posé des questions à ce sujet et je considère avoir reçu une information complète. Je comprends que je peux refuser de participer ou retirer ma participation à cette étude à tout moment sans aucune conséquence sur mon emploi actuel ou futur ou sur mon implication avec le projet PC-PR. Je comprends également que toute information nominative me concernant sera gardée strictement confidentielle. Je soussignée accepte de participer à cette étude en accordant une entrevue de 45 minutes, en donnant ma permission pour l'observation durant deux ateliers de nutrition.

\_\_\_\_\_  
Nom du participant

\_\_\_\_\_  
Signature du participant

\_\_\_\_\_  
Date

Je certifie a) avoir expliqué au signataire les termes du présent formulaire de consentement; b) lui avoir clairement indiqué qu'il reste à tout moment libre de mettre un terme à sa participation à la présente recherche

\_\_\_\_\_  
Nom du Chercheur

\_\_\_\_\_  
Signature du Chercheur

\_\_\_\_\_  
Date

**Consentement de l'enseignant(e) de l'école \_\_\_\_\_ à participer à l'étude :**

*Évaluation de la mise en oeuvre du projet Petits cuistots - parents en réseaux :  
Les représentations du personnel enseignant, l'intérêt des élèves pour la nutrition  
et leur perception du climat psychosocial de l'école*

Sherri Bisset, candidate au doctorat en santé publique, Université de Montréal  
Dr Louise Potvin, directrice de recherche

**Entrevues individuelles, observations en classe,  
collaboration à l'enquête auprès des élèves**

**Nous vous invitons à bien lire ce formulaire et à poser des questions  
avant d'y apposer votre signature.**

**Introduction**

Cette étude est conduite par une étudiante au doctorat, Sherri Bisset supervisée par Madame Louise Potvin titulaire de la Chaire Approches Communautaires et inégalités de santé, ainsi que Dr Mark Daniel titulaire de la Chaire de recherche du Canada en biopsychologie et santé des populations. Une bourse des Instituts de recherche en santé du Canada attribuée à l'étudiante assure le financement principal de cette étude. Étant donné que l'étude proposée fait partie d'une évaluation plus générale du projet PC-PR, elle sera réalisée en partenariat avec les organismes associés à cette évaluation, notamment Les ateliers cinq épices, la Commission scolaire de Montréal, la Fondation Lucie et André Chagnon et la Table de concertation sur la faim et le développement social du Montréal métropolitain.

**Description du projet**

L'intervention en nutrition du projet *Petits cuistots – Parents en réseaux* (PC-PR) se déroule depuis maintenant six ans dans huit écoles primaires de la CSDM, incluant l'École \_\_\_\_\_. Cette étude fait partie d'une recherche évaluative du projet PC-PR dans les écoles participantes. L'objectif de cette étude est 1) d'évaluer le niveau d'implantation du projet en considérant les pratiques du personnel enseignant et des nutritionniste pendant l'atelier nutrition; 2) d'estimer les facteurs qui pourraient influencer ces pratiques et y être associés; et 3) de revoir le contenu des ateliers en lien avec le *Programme de formation de l'école québécoise*. Cette étude évaluative permettra de fournir aux parties intéressées l'information requise pour comprendre et anticiper 1) les variations dans l'implantation et les retombées du projet, 2) la façon de déployer le projet dans d'autres écoles et 3) le potentiel de viabilité du projet.



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APPENDIX D

Interview guide with nutritionists

### Entrevue avec des Nutritionnistes

*« Cette entrevue vise à commencer une série d'entrevues avec les intervenant(e)s du projet PC-PR et aussi les enseignant(e)s qui sont impliqués dans le projet PC-PR. Je te poserai des questions sur les grandes lignes du projet PC-PR. Je voudrais connaître ton rôle dans le projet PC-PR, et aussi, la relation entre le projet PC-PR et l'école.*

*Les questions que je te poserai peuvent te sembler imprécises ou sujettes à interprétation. Je voudrais que tu te sentes à l'aise de me demander des clarifications pour les questions qui te sembleront ambiguës – mais aussi je veux te rappeler que je ne cherche pas une bonne réponse, mais plutôt à avoir tes opinions, tes expériences, et aussi des choses un peu abstraites qui peuvent être difficiles à toucher, comme tes perceptions ou représentations intellectuelles.*

*Enfin, je voudrais que tu saches que mon objectif est d'appuyer le projet PC-PR. Je peux offrir mon soutien par des articles que j'écrirai pour des revues scientifiques. Mon objectif est de décrire le projet PC-PR positivement de par sa nature innovatrice. Alors, je ne suis pas ici pour faire des critiques ou d'identifier des problèmes. »*

On commence...

#### Question 1

- i) Comment as-tu connu ce projet PC-PR ?
  
- ii) Qu'est-ce qui a suscité ton intérêt pour travailler pour ce projet PC-PR ?
  
- iii) Comment cet intérêt est-il différent de ton intérêt aujourd'hui ?

#### Question 2

- i) En quoi le programme est-il innovateur ?
  
- ii) Quelle est ta contribution pour rendre le programme innovateur ?

#### Question 3

Par rapport à la phrase suivante;

« Le projet PC-PR visant à lier dans un même espace social, les enjeux relatifs au développement social, au projet éducatif de l'école et à la santé »

- i) Comment tu expliquerais ou qualifierais cette vignette ?
  - Donne-moi un exemple ou une situation concrète.



Question 4

Décris-moi ton rôle dans le projet PC-PR ?

- Quelles sont tes tâches principales ?
- Qu'est-ce que tu aimes le plus dans tes écoles?
- Quelles sont les défis dans tes écoles?

Question 5

*Nutritionnistes & Agentes...*

Maintenant je vais parler du déroulement de l'atelier...

*Nutritionnistes...*

A quoi serve l'activité préparatoire...

i) Comment l'activité préparatoire a une influence sur l'atelier?

ii) Quelle est l'intérêt de l'enseignant de faire l'activité préparatoire?

iii) Pour quelle raison penses-tu que des enseignants qui sont moins intéressés à faire l'activité préparatoire ?

iv) Si j'étais un enseignant de 5<sup>ème</sup> année comment tu me convaincras de l'importance à faire l'activité préparatoire

- o Pour toi (nutritionnistes)
- o Pour moi (enseignantes)

*Nutritionnistes & Agents...*

i) Si Joanne ou Manon te dit qu'il faut être en " collaboration avec l'enseignant " ?

- Qu'est-ce que tu dirais ou ferais pour être en collaboration ?
- Qu'est-ce que tu dirais qu'il faut améliorer pour avoir une meilleure collaboration avec les enseignants ?

ii) Qu'est que la collaboration avec l'enseignant représente pour toi ?

- Les effets envers les élèves...

iii) Si j'étais dans une classe avec un enseignant qui collabore et dans une autre classe où l'enseignante collabore moins, comment pourrais-je voir la différence?

- Qu'est que je verrai différemment ?
  - o avec l'enseignante...
  - o avec les élèves...
  - o avec toi ?

*Nutritionnistes & Agents...*

Pour la participation des parents...

- Quelle est le rôle des parents dans l'atelier?
- Comment le savent-ils ?
- Comment la participation des parents à une influence sur le déroulement de l'atelier?

### Question 6

*Nutritionnistes...*

i) Comment voyez-vous ce qu'il faut accomplir avec...

- les (individuellement) élèves
  - o Quelles sont les connaissances que tu veux leurs transmettre ?
  - o Qu'est-ce que t'aimerais qu'ils comprennent ?
  - o Qu'est-ce que t'aimerais qu'ils appliquent ?
  - o Quelles sont les habilités que tu aimerais qu'ils développent?
- La classe en son entier
- Les enseignants
- L'école

ii) Comment ta perception de qu'est-ce qu'il faut accomplir à changer de l'année dernière?

- Pourquoi ?

iii) Pour l'avenir, comment ta perception de qu'est-ce qu'il faut accomplir pourrait changer ?

- Pourquoi ?

*Agents développement...*

i) Comment voyez-vous qu'est-ce qu'il faut accomplir avec...

- Les parents ?
  - Qu'est-ce qu'un parent pourrait dire, pour te faire sentir que tu es sur la bonne voie pour remplir tes objectifs?
  - Qu'est-ce que quelqu'un des écoles pourrait te dire, pour que tu sentes que tu as accompli quelque chose?
- Les enseignantes ?
- L'école ?
  - Qu'est-ce que tu veux qu'ils ou qu'elles comprennent ?
  - Qu'est-ce que tu veux qu'ils ou qu'elles appliquent ?
  - Quelle sorte d'habilités que tu veux qu'il ou qu'elle apprennent?

ii) Comment ta perception de qu'est-ce qu'il faut accomplir à changer depuis l'année dernière ?

- Pourquoi ?

iii) Pour l'avenir, comment ton perception de qu'est il faut accomplir peut changer ?



- Pourquoi ?

### Question 7

#### *Nutritionnistes & Agents...*

i) Relativement à ce que tu penses sur les conditions dans les autres écoles avec les autres (*nutritionnistes*) (*agentes communautaire*) qu'est-ce qu'il y a de l'école X qui rendrait ton travail plus...

- Facile ?
  - Pourquoi ?
  - Comment ?
  - Est-ce que tu as contribué à créer ses conditions ?
- Difficile ?
  - Pourquoi ?
  - Comment ?
  - Qu'est-ce que tu fais ou peut faire pour changer ses conditions ?

### Question 8

#### *Nutritionnistes & Agents...*

i) Quels sont les aspects de ton travail que tu aimes le plus...qui te font sentir le plus relax où valorisé?

ii) Quels sont les aspects de ton travail que tu aimerais améliorer...qui te feraient sentir insécure, mal alaise ?

- Qu'est-ce que te permettrai de changer?

iii) Relativement à ce que tu penses sur les pratiques des autres (*nutritionnistes*) (*agentes communautaire*) qu'est-ce qu'il y a de ta pratique qui semble être différent ou unique à toi?

iv) Comment ta pratique a changé des années précédentes ?

- Comment ?
- Pourquoi ?

v) Qu'est-ce que tu peux faire pour améliorer ta pratique ?

- Sens-tu que tu as l'appui nécessaire pour les réaliser ?
  - Avec les Ateliers cinq épices (la direction, les autres intervenantes) ?
  - Avec l'école (la direction, les enseignantes) ?

Question 9

Qu'est-ce que tu espères de nouveau cette année ?

- Avec l'école
- Avec la classe
- Avec l'enseignant(e)

Question 10

Selon toi, pourquoi ce programme est-il important pour les élèves ? Cela fait quoi ? Cela fait quelle différence dans la vie d'un enfant?

- Pourquoi tu penses cela?

Si on compare une école où on a le projet PC-PR avec une autre sans ce projet PC-PR. Dans quelle façon penses-tu que l'on va voir l'effet du projet PC-PR avec les enfants de sixième année.

- Des connaissances en quoi ?
- Des habilités en quoi ?
- Une attitude vers quoi ?
- Un comportement ?
- Autre ?

Question 11

Si tu étais le Ministre de l'éducation ...

Implanterais-tu ce programme dans toutes les écoles primaires?

- Oui / non ?
- Pourquoi?

Pourquoi un directeur va avoir un intérêt pour ce projet PC-PR dans son école?

Comment ce projet est complémentaire à l'agenda de...

- La direction de tes écoles?
- Pourquoi tu dis cela ?

Pourquoi un enseignant(e) aurait un intérêt pour ce projet PC-PR dans son école?

Comment ce projet est complémentaire à l'agenda de...

- Pourquoi tu dis cela ?

Question 12

Dernière question.

Si vous avez une baguette magique capable de changer deux choses avec le projet PC-PR, qu'est-ce que tu changerais pour le mieux?

- Toi et ton rôle?

- Le fonctionnement du projet PC-PR?

Est-ce qu'il y a d'autres aspects du projet PC-PR dont on n'a pas parlé et qui pourrait être intéressant?

## APPENDIX E

Example of the 'moments of translation' coding scheme as it was used to code data in reference to Teachers from one of the Nutritionist's interviews.

December 17, 2006

Entity : Teachers

*Puis le directeur lui avait parlé de notre projet, puis il lui avait parlé un peu des difficultés au niveau de certains profs, qui disaient qu'ils n'avaient pas le temps, qu'ils ne voyaient pas la portée. Il disait « Si jamais on peut intégrer le projet dans... s'ils peuvent passer leur matière pédagogique ou leur enseignement à travers les ateliers, ils vont peut-être les voir pas comme une perte de temps. »*

SOCIO : Controversy : Teachers : some not wanting program on timetable

SOCIO : Controversy : Teachers : some not seeing how program benefits students

SOCIO : Controversy : Teachers : disinterest, lacking time for program

*Euh... de plus réfléchir sur... Au début, je m'aperçois qu'on y allait un peu comme ça venait, là, tu sais, un peu. On s'imaginait... on présentait ça, les ateliers, un peu comme on pensait que ça devait être, mais il nous manquait des choses. Là, je le réalise, l'aspect pédagogique, là. Souvent, les enseignants nous faisaient des... « Bien c'est bien trop avancé! Vous donnez des concepts aux pré-maternelles quand ils ne sont même pas... » Tu sais, on n'avait pas cet aspect-là. « Ils ne sont même pas conscients du temps, de la notion de temps. Vous employez des mots qu'eux autres, ça ne représente rien. C'est avec le temps qu'on s'aperçoit que oui, c'est vrai, ... je trouve que j'ai fait beaucoup de progrès à ce niveau-là.*

SOCIO : Interestment : Teachers : identifying pedagogical content problems to Nutr

SOCIO : Identity : Teachers : provide pedagogic advice to Nutr

*Un moment donné, la prof avait tellement fait quelque chose d'intéressant que je me disais que c'était comme un spectacle qu'ils m'avaient donné, ça fait que là, j'ai dit « Bien je trouve que ça devrait être vu par d'autres que rien que moi, puis que le parent. » Ça fait que là, j'ai dit « Même, je vais en parler, puis ça serait le fun que vous le présentiez lors de la fête de fin d'année. » Puis finalement, l'idée a tellement été... tu sais, les gens ont tellement trouvé ça le fun, que finalement, ils l'ont intégré, puis ça s'est fait ailleurs aussi, puis c'est devenu comme le fun, là, parce que tu sais, ils présentaient devant les parents quelque chose*

SOCIO : Mobilisation : Teacher : creating a class activity from program

*L'enseignant dite « Ah, oui, tu sais... Ah oui, c'est vrai, tu sais, ceux qui sont trop leaders ou trop retirés, ça sort avec ça. » Puis tu peux travailler là-dessus. Ce n'est pas de la nutrition, ce n'est pas... mais tu sais, ça fait qu'en même temps, il y a cet aspect-là, développement personnel*

SOCIO : Enrolment : Teachers : recognizing need for collaborative learning approach in workshops

*Dominique, la conseillère, allait voir aussi, elle s'organisait avec l'enseignant, c'est elle qui lui disait tout comment c'était pour fonctionner. C'est elle qui avait monté les rôles,*

*tu sais, parce qu'elle a vu un peu comment nous autres on fonctionnait, là, notre de rencontre, elle dit « Je vais préparer comme un mode de fonctionnement. » Moi, j'étais d'accord avec son mode, qu'elle donnait des rôles. Elle avait comme précisé pas mal, aussi. Puis elle dit « Je vais aller voir l'enseignante avec ça, puis je vais voir si elle est réceptive, intéressée. Si oui, tu sais, je vais toute lui donner l'information pour qu'elle puisse l'expliquer aux élèves. » Puis l'enseignante était intéressée, elle a expliqué ça aux élèves, et puis elle a même... l'enseignante a dit « O.K., moi, je vais évaluer mes élèves, même, lors... pour collaboration, méthode de travail. »*

SOCIO : Mobilisation : Teachers : using workshop to develop collaborative learning work method

SOCIO : Mobilisation : Teachers : using workshop to evaluate a QEP competency

*Elle a passé par lui, c'était supposé être un vendredi, puis elle, elle était à l'école Jeanne-Leber, puis elle dit « Est-ce que je pourrais aller présen... tu sais, présenter comment on fonctionne dans les ateliers, avec la collaboration, à tous les ateliers 5 épices? » Lui (ED Dir), il n'a pas voulu. Il dit « Non, tu es... » Tu sais, c'est comme une ressource qu'il veut qu'elle soit seulement pour Jeanne-Leber, parce qu'ils ont des gros besoins, parce qu'ils ont beaucoup de congé de maladie, présentement.*

SOCIO : Identity : Teachers : leave the school because of illness

*12 Écoute : si le directeur à cette école-là, je ne peux pas faire autrement, tout le monde le veut », puis tu vois que c'est ça, c'est ça que vers... c'est populaire, cette méthode de fonctionnement-là, la collaboration. C'est de plus en plus. Ça fait que là, je me dis « Pourquoi on irait contre ça? » Parce que c'est un courant que même, ils appliquent dans la réforme scolaire, qu'ils appliquent partout, qu'ils veulent*

SOCIO : Identity : Teachers : interests are similar to those of ED Dir

SOCIO : Identity : Teachers : increasingly have interest for collaborative work methods

*14 Ça fait que là, c'est quand même... Je trouve que Jeanne-Leber, c'est quand même assez... il y a un esprit positif dans cette école-là en général. Il y a beaucoup de congés de maladie, là, mais il y a quand même... tu sais, ce n'est pas négatif, l'attitude des enseignants puis de la direction n'est pas pessimiste puis négative comme il y a disons à Petite-Bourgogne. Le personnel enseignant, là, est très négatif, pessimiste, cherche tout le temps à se plaindre, voit tout le temps les choses comme... difficiles, du travail, du surplus, ... Peut-être qu'ils vivent des choses difficiles aussi, là, je peux les comprendre. Mais...*

SOCIO : Identity : Teachers : can have positive attitude towards their school

14SOCIO : Identity : Teachers : can have negative attitude towards their school

*Puis il y a une enseignante qui avait parlé au directeur, parce qu'elle trouvait que c'était un peu bébé, là, de la manière qu'on fonctionnait. Ses élèves envoyaient des commentaires désintéressés. Puis ils commençaient à douter, les enseignants des niveaux plus élevés, que les élèves, ils voyaient qu'ils n'étaient pas autonomes...*

8SOCIO : Identity : Teachers : question quality of workshop functioning

8SOCIO : Identity : Teachers : talk about quality of workshop with direction  
SOCIO : Identity : Teachers : want students to participate in activities that challenge them  
SOCIO : Controversy : Teachers : disinterest, seeing student autonomy underdeveloped  
SOCIO : Identity : Teacher : speaking out on behalf of students

*Puis l'enseignante était intéressée, elle a expliqué ça aux élèves, et puis elle a même... l'enseignante a dit « O.K., moi, je vais évaluer mes élèves, même, lors... pour collaboration, méthode de travail. » Pas la première fois, mais elle a averti ses élèves qu'elle va leur donner comme deux fois, puis après ça, la troisième fois, elle va les évaluer, là, puis ça va être sur le bulletin.*

SOCIO : Mobilisation : Teachers : using workshop to develop collaborative learning work method

SOCIO : Mobilisation : Teachers : using workshop to evaluate a QEP competency

9SOCIO : Interesement : Teacher : evaluate student workshop performance for bulletin

*Si l'enseignant collabore plus, les élèves vont être plus réceptifs, puis ils vont... tu sais, ça va fonctionner... le fonctionnement va être plus facile, le déroulement, on va pouvoir faire plus de choses, moins de discipline.*

*Si l'enseignante n'est pas... les élèves sentent que l'enseignante collabore moins... Oui. À ce moment-là... Ça va se répercuter sur les élèves aussi. Si l'enseignante profite de chaque occasion pour dire « Oui, moi je trouve que c'est important. » ou va faire des anecdotes, va apporter des anecdotes, (???) comme dire « Bien non, tu ne ferais pas ça, parce que là, la recette peut être manquée », tu sais, ou si elle accorde de l'importance à ça. Ou dire « Bien c'est beau, regarde, tu travailles bien, c'est... » Tu sais, je trouve que ça fait toute la différence. Les élèves vont mieux participer.*

11SOCIO : Interesement : Teacher : maintaining control of class during workshop

11SOCIO : Interesement : Teacher : guiding individual students during workshop

11SOCIO : Interesement : Teacher : adding antidotes to class on workshop topics

11SOCIO : Enrolement : Teacher : guiding individual students during workshop

11SOCIO : Enrolement : Teacher : adding antidotes to class on workshop topics

SOCIO : Enrolement : Teacher : providing commentary during nutrition workshop

SOCIO : Enrolement : Teacher : providing commentary on workshop topic

SOCIO : Enrolement Teacher : providing students guidance during workshop

*Tu sais, c'est comme une ressource qu'il veut qu'elle soit seulement pour Jeanne-Leber, parce qu'ils ont des gros besoins, parce qu'ils ont beaucoup de congé de maladie, présentement.*

SOCIO : Identity : Teachers : leave the school because of illness

*Ça dépend des gens, mais ça change, ça. Ça fait que des fois, tu ne sais jamais, tu peux avoir fait une... vraiment intégrer, mais tout le personnel enseignant change, la direction change...*

SOCIO : Identity : Teachers : have a high turnover in schools

La réceptivité au niveau des enseignants, tu sais, la relation que tu as avec les enseignants. S'il y a des réticences, tu sais, par rapport... Tu sais, si tu sens que c'est bienvenue, tu sais, qu'ils trouvent ça agréables puis qu'ils en voient un bénéfice pour les élèves et pour eux, qu'ils trouvent ça intéressant, tu le sens, ça, à ce moment-là. Tu te dis bon, au niveau des enseignants, c'est intégré

SOCIO : Identity : Teachers : openly demonstrate level of interest

Ça, ça a débuté l'année passée, à cause des... à Jeanne-Leber, il y a des enseignants qui voulaient avoir moins de temps, ils trouvaient que ça perdait de... qu'ils manquaient de temps pour donner des ateliers, qu'ils avaient d'autres projets, puis ça leur prenait beaucoup de temps.

SOCIO : Controversy : Teacher : disinterest, lacking time for program

Ça fait que ça, finalement, avec ça, même ces enseignants-là qui ont d'autres projets, ils ont demandé à Jeanne-Leber juste la moitié des ateliers. Comme concession, le directeur dit « Bien c'est un projet intéressant, tu sais, ça ne prend pas tant de temps ». Ils ont fait comme une concession pour qu'ils prennent juste 4 ateliers sur 8. Ça fait que là, finalement, on a fait le... on a accepté ça.

SOCIO : Controversy : Teacher : disinterest, lacking time for program

Puis elle, elle a vu que dans notre projet, vu que c'est multi-tâches, qu'elle appelle, elle dit « C'est vraiment l'outil qui va faire qu'après, ils vont pouvoir appliquer la même chose quand ils vont faire du français, quand ils vont faire des maths. »

SOCIO : Goal : Teachers : deliver math and language material to students

Je trouve que... moi, à Jeanne-Leber, on dirait que je n'ai pas tellement de difficultés (avec activité préparatoire). Ça a été accepté, bien accepté, c'est fait en général, pas pour tout le monde. Ça dépend toujours de l'enseignant. Il y a des enseignants que tu vois qu'ils aiment ça, puis qu'ils vont le faire, puis qu'ils vont même en faire plus. Je ne pense pas que ça soit vu comme une charge supplémentaire de travail. Pour certains, peut-être, là. À certaines occasions. Mais je pense que c'est vu comme quelque chose qui n'est pas si compliqué, puis que finalement, fait que c'est normal de faire les choses comme ça, là, au niveau pédagogique, là, que c'est bien.

SOCIO : Enrolment : Teachers : completing preparatory activity with students

SOCIO : Identity : Teachers : inconsistent, may or may not complete preparatory activity

En général, moi, je le... la majorité, là, des profs à Jeanne-Leber, c'est ça. Petite Bourgogne, c'est différent, parce qu'ils sont débordés. On peut comprendre, c'est un autre contexte. Mais Jeanne-Leber, en général... Puis même, des fois, on s'attendait, de la manière que Johanne parlait, que ç'aurait été les jeunes, les profs qui sont là depuis plus longtemps qui seraient plus réticents, puis même, au contraire, moi, j'ai des vieilles profs, là, qu'ils en font plus, même, que qu'est-ce qui est demandé. Puis ils apportent tout le temps ça, ils sont fiers

SOCIO : Identity : Teacher : interest with prep activity depends upon school

SOCIO : Identity : Teachers : interest with prep activity depends upon experience



SOCIO : Identity : Teachers : overwhelmed teachers less interested in prep activity

*...en général, je suis chanceuse, parce qu'ils voient l'importance. Parce que des fois, le fait d'afficher, là, ceux qui leur font bien, là, je m'aperçois qu'il y en a qui disent... il sont fiers que... « Ah oui, je ne l'ai pas présent... ne l'affiche pas, parce que ce n'était pas à mon goût, puis je n'ai pas eu le temps de le corriger » ou « Je l'ai affiché... » Bon, je dis « Oui, oui, oui, je voulais justement l'afficher. » Tu vois que pour eux autres, ça a de l'importance. Le travail... tu sais, c'est comme... ils se vérifient. Je m'aperçois, qu'il y a comme un compétition.*

SOCIO : Enrolement : Teachers : completing preparatory activity with students

SOCIO : Identity : Teachers : have sense of competition amongst themselves

*... il y a quand même un déroulement, là, à l'atelier, mais au niveau de la discipline ou de la dynamique de la classe, c'est l'enseignant souvent qui amène sa propre dynamique ou... C'est à ce niveau-là qu'elle peut amener son aspect, des fois... on trouve que ça se... comment je dirais? Disons si elle ne contrôle pas bien sa classe ou sa classe, il n'y a pas beaucoup de disc... elle a de la misère avec la discipline, bien nous autres aussi, on va avoir de la misère. Ça fait qu'on va essayer de trouver des moyens ensemble.*

SOCIO : Identity : Teachers : have different levels of discipline according to individual style

*Mais... oui. C'est comme apprendre, puis donner le goût. Souvent, je vois qu'ils (les enseignants) essaient des recettes. Ils les font à la maison. Ça, je trouve ça le fun. Ça, c'est un aspect... Puis que tu sais, je me dis, bon, c'est des recettes toujours santé, ça fait que là, ça va... C'est qu'ils parlent de l'alimentation, puis de santé, que ça éveille quelque chose en eux, je trouve ça bien. Puis que ça leur donne le goût, là, de s'apercevoir que s'alimenter, bien ça fait partie de l'éducation aussi. Puis de... la santé, mais ce n'est pas mon but. Je m'aperçoive que mon but, moi, c'est les enfants, là.*

SOCIO : Identity : Teacher : personal interest, some trying workshop recipe at home

SOCIO : Identity : Teacher : personal interest, some speaking about nutrition and diet

*C'est sûr que la clientèle n'est pas... les élèves sont plus difficiles, sont plus turbulents, mais je pense qu'ils sont entrés dans une espèce de dynamique, là, de se plaindre, puis de (???). Ça fait que là, tu sais, c'est comme le moins on en fait, le mieux c'est... Tu sais, bon, si ça peut finir... Tu sais, des fois, tu le sens, même, au courant de l'année, chez certains enseignants. Ça, c'est pénible, je trouve.*

SOCIO : Identity : Teachers : can be reluctant to contribute more than necessary

**Sherri :** *Pourquoi un enseignant va avoir l'intérêt pour ce projet?*

**Répondante :** *Bien je trouve que c'est un projet qui est intéressant. Elle n'a pas grand-chose à faire, c'est pas mal clé en main, puis si elle voit, elle pense au développement global de l'enfant puis que ça engendre des choses que peut-être elle, elle n'aura pas le temps de montrer, là, ça complète un peu son enseignement, là, je trouve, avec la santé, disons au niveau alimentation, ouverture à d'autres... des connaissances, que des fois...*

) que finalement, qui sont intéressantes à connaître aussi, au niveau de l'enfant, au niveau agriculture diversifiée, écologie, on touche plein de... alimentation internationale, il y a bien des aspects, géographie, tu sais, tu vois, il y a des profs qui le catch vite, ça. Tu sais, ils voient vraiment « Aye, je ne savais pas... » Il y a des profs qui me disent « Je ne savais pas que ça... tu sais, géographie. Ah oui, on l'a appris, tu sais, c'est dans tel continent! » Tu sais, tu le vois, les profs. Ça, « Hey, vous devriez savoir ça, les fractions, c'est dans la recette! » Il y en a bien des aspects, là, au niveau science et technologie, les plus vieux, oui, ils voient vraiment qu'on montre d'autres choses que juste quoi manger, puis quoi ne pas manger. Puis ils embarquent, là, tu sais.

SOCIO : Goal : Teachers : to provide students with comprehensive education

SOCIO : Identity : Teachers : lack resources or ability to provide comprehensive education

## APPENDIX F

Examples of memos describing how non-human entities were identified as *interessement* devices.

### Techno-gram of Petits Cuistots (PC) – inanimate entities and interessement devices

The PC workshop is identified by a set of inanimate entities which are placed into operation through three techno-grams. These techno-grams are used as devices of interessement to link together school and program entities into a network of co-dependence. The first techno-gram places a recipe, food and cooking utensils into operation with a hands-on cooking and tasting activity. The second techno-gram places information about food and nutrition into operation through an instructional, sit and listen lesson. The third techno-gram may use information, food, or a recipe in the form of an activity to be completed outside the PC workshop, ideally, prior to the workshop itself. These techno-grams are described as forming two types of alliances; one which responds to the program goals which respond to a health problem (i.e. future health and healthy eating), and a second which aims at the establishment of the program into the school through the formation of links between several socio-grams (i.e. parents & students, students & school, teachers & education program).

The hands-on cooking and tasting activity is identified by a certain rhythm, which can be chaotic, organised or synchronised. The degree to which students themselves are given place to control the operation of the workshop is directly proportional to the degree to which the workshop is chaotic. The degree to which the workshop is run in an orderly way is not haphazard; it is the result of the intentionality of the Nutritionist to leave things more or less in the hands of the students. The workshop is consistently identified as ending well, even if the recipe has been ruined because of some errors in measurement, the end result is consistently positive, providing a produce which all students can taste. The positive functioning of this tasting activity is attributed to a mutual influence between students which has been built over time, and would not likely exist in another grade 4 or 5 classroom in another school which has not created this place where tasting new or different foods is accepted.

The hands-on cooking and tasting activity is an interessement strategy. It is a device used to link other entities into the Nutritionists' goals. The hands-on cooking techno-gram, is a component of the nutrition workshop and involves students working together to transform food according to the instructions of a recipe. Four entities are tied into the nutritionists' goals (i.e. become programmed) using this device, those are, parents, students, the educational program (i.e. the reform), and food.

The recipe techno-gram is used as a device to interest parents to participate in the nutrition workshop by providing parents with a paper copy and a taste sample of the recipe students completed during workshops. If this initial strategy is successful, and the parent does come to the school to volunteer during the recipe techno-gram. It is also used as a strategy to re-iterate nutrition messages. This activity also acts as an interessement strategy to link parents to their children. It does this through students showing their cooking abilities to their families, and providing an family activity during which children can bond with their parents.

It is also an interestment device which wants to become essential for the teacher to implement the educational program. It does this by containing mathematic principles in measurement and introducing new vocabulary and precise language skills. Also, this activity aims to provide the newer part of the Quebec Education Program (i.e. the reform) with a cooperative learning activity which targets social learning competencies and also, a needed opportunity to be evaluated and thus enhancing the legitimacy of the reform.

The hands-on cooking and tasting activity is also an interestment device which is needed in order for food to become understood in all of its complexity. Food is identified as being misunderstood and overly simplified. It is frequently classified as being either good or bad for health and monotonous, lacking awareness of its diversity. Its nutrient content is not well understood. There is also little appreciation of how food becomes transformed from its raw form. The program acts as a device of interestment by creating alliances between food and students. It does so by making food transformable, healthy and new foods tasty, and raw foods approachable.

The hands-on cooking and tasting activity is an interestment strategy to connect students to food by placing students in action thus appealing to their nature desire to manipulate concrete objects and create tangible results.

The reform, or the educational program, is described as an entity used by the education actors to deliver academic material and develop student competencies. As the new educational program, it contains elements which are familiar to teachers and elements which are unfamiliar. The new educational program aims to develop competencies, both new and old, however through the use of projects. Projects contain several features; they develop several competencies simultaneously, they make learning concrete by placing students in action manipulating tangible objects. The reform is closely associated with a new type of competency, cooperative learning, which is new to educators, and for which educators do not have the materials, the expertise, nor the means to evaluate. Thus, while many of the components of the educational program are likely to have remained the same, Nutritionists identify the reform as something that is in the process of settling into schools, and as being used more or less comfortably between teachers based upon their lack of resources and ability to implement it. It might be described as the current interestment strategy which is being used by educators to educate children.

As an educational program, the reform includes health education which requires competencies that the teachers do not have.

The reform is being used in different ways and at different levels among teachers

## APPENDIX G

Example of narratives and *problematization* codes  
for nutritionists and students

## Category Table 4c. Problematization, Nutritionist

The Nutritionists all identify their general long term goal as being the prevention of adult onset disease associated with poor diet, by making long term impact on quality of diet and by re-inserting traditions of cooking. This long term goal is described by a short term objective to *instil a taste for healthy eating in elementary school children*. This over-arching goal captures several properties which elaborate what the Nutritionists are aiming to accomplish and how they aim at its accomplishment. To *instil* highlights that the Nutritionists are aiming to be in contact with the students over some degree of time. In order to *give a taste* the Nutritionists aim to provide an enjoyable experience that students will want to repeat, but that is also normative (i.e. to have good or bad taste), with a right and a wrong according to sanctioned standards. By aiming to influence *healthy eating* Nutritionists aim to influence a pattern or practices that are repeated over time and persist into the future. All Nutritionists aim to link parents into the intervention, however, while all Nutritionists express that they aim to instil a taste for healthy eating in the home, some Nutritionists also aim to strengthen a link between the parent and the school (via the experience of their child).

The Nutritionist identifies herself by the ways in which she perceives herself as being part of the school or a part, separated from the school. The more time the Nutritionist is able to spend in the time, the more likely it is that she will develop the kinds of relationships she needs to feel a part of the school community. Nutritionists also need to sense that they have a place within this community to feel a part. This place is created by their professionalism. The strength of relationships to teachers is also built upon confidence. Nutritionist identifies herself by her level of comfort with the ED Dir.

The Nutritionist is the animator and as such she is the key actor in the program, her stage is the nutrition workshop.

Nutritionists

SOCIO : Goal : Nutr : prevent adult onset disease associated with poor diet  
 SOCIO : Goal : Nutr : make long term impact on quality of diet  
 SOCIO : Goal : Nutr : re-insert traditions of cooking

Goal : to instill a taste for healthy eating among elementary school children  
 SOCIO : Goal : Nutr : maximize presence in school  
 SOCIO : Goal : Nutr : provide enjoyment experience with food  
 SOCIO : Goal : Nutr : raise awareness of nutritious food

Goal : to include parents in students experience  
 SOCIO : Goal : Nutr : strengthen link between parents & school  
 Goal : instill healthy eating practices in home

Identity : Nutr : Being part of apart of school  
 SOCIO : Identity : Nutr : ability to spend time in the school  
 SOCIO : Identity : Nutr : building trust  
 SOCIO : Identity : Nutr : strong or weak connection with ED Dir  
 SOCIO : Identity : Nutr : partners with school interventionists  
 SOCIO : Identity : Nutr : more or less accepted among teachers  
 SOCIO : Identity : Nutr : more or less professional credibility with teachers  
 SOCIO : Identity : Nutr Team : dependent upon ED Dir and teachers for annual renewal  
 SOCIO : Identity : Nutr : bridge in parent and teacher relations

Identity : Nutr : An animator  
 SOCIO : Identity : Nutr : more or less in control of class  
 SOCIO : Identity : Nutr : more or less at ease  
 SOCIO : Identity : Nutr : interacts more or less with teacher  
 SOCIO : Identity : Nutr : improvising or standardizing  
 SOCIO : Identity : Nutr : mastering or questioning  
 SOCIO : Identity : Nutr : learning from past experience  
 SOCIO : Identity : Nutr : directive or semi-directive  
 SOCIO : Identity : Nutr : more or less experienced  
 SOCIO : Identity : Nutr : may or may not appreciate parental presence

Identity : Nutr : health professionals  
 SOCIO : Identity : Nutr : completed professional formation in community nutrition  
 SOCIO : Identity : Nutr : giving professional knowledge  
 SOCIO : Identity : Nutr : spokesperson for Nutr Educ among educators  
 SOCIO : Identity : Nutr : spokesperson for Nutr Educ among health experts  
 SOCIO : Identity : Nutr Team : as part of a professional order  
 SOCIO : Identity : Nutr Team : giving something to students for their future good  
 SOCIO : Identity : Nutr Team : lack pedagogical know-how  
 SOCIO : Identity : Nutr Team : possessing professional knowledge  
 SOCIO : Identity : Nutr Team : providers of essential tools and information

Identity : Nutr : Being part of apart of the program Team  
 SOCIO : Identity : Nutr Team : practice distinctively from Nutr working for government  
 SOCIO : Identity : Nutr : bridges parents and ADS  
 SOCIO : Identity : Nutr : spokesperson for PC-PR  
 SOCIO : Identity : Nutr Team : repetitive monthly tasks  
 SOCIO : Identity : Nutr Team : young, lacking assertiveness  
 SOCIO : Identity : Nutr : becoming a confident spokesperson  
 SOCIO : Identity : Nutr : in opposition with social development aims  
 SOCIO : Identity : Nutr : more or less in unison with ADS  
 SOCIO : Identity : Nutr : more or less in unison with social development aims

Identity : Nutr : Planners  
 SOCIO : Identity : Nutr Team : create workshop  
 SOCIO : Identity : Nutr Team : creators of workshop  
 SOCIO : Identity : Nutr : has vision for project into future  
 SOCIO : Identity : Nutr Team : share and learn new practices  
 SOCIO : Identity : Nutr : continually adding new elements

**Commentaire [SB1] : building connections of confidence?**

**Commentaire [SB2] : Giving tools and information**

**Commentaire [SB3] : To control manipulate food**

**Commentaire [SB4] : To understand food**

**Commentaire [SB5] : Having a distinctiveness**



SOCIO : Identity : Nutr : organizer of workshop

## Category Table 4c. Problematization, Students

Students want to be recognized for what they can do and what they know. In particular, they want to participate in privileged activities which are normally reserved for adults and they want to 'be in the know' or to obtain information which popular, valuable and useful. Older students in particular want to gain control over objects to reinforce their abilities and develop autonomy. Younger students also want to gain control over objects however they are more interested in having these abilities reinforced by significant adults, and thus want to bring their parents into their schools. Older students want to expand their knowledge of the world around them and learn about different people, new cultures and customs. Younger students and students who have recently immigrated to Canada want more to reinforce and strengthen connections between their existence at school and their existence at home.

Students are identified as representing a generation which is at imminent health risk. They currently consume the foods that cause obesity and they themselves have a rate of obesity which poses a problem for the future of population health. Needless to say, students are not exposed to the knowledge nor provided with the exposure nor experience they will need to protect themselves in the future and reverse this trend. Here, students are also identified as carriers of information through time (i.e. into the future) and through space (i.e. into their homes).

Younger students are particularly apt to a fear for the unknown and are reluctant to try new foods. All students are more likely to reject foods which they perceive to be 'healthy'. These lines of closure are flexible however as students adapt easily and evolve quickly. That is, they change quickly from one academic year to the next and are impressionable, malleable and receptive to integrate and accept new influences. Students make up a cohesive collective (i.e. the classroom) which is identified as a space of influence, competition and power differentials.

Students are highly diversified. They have unique abilities (talents, difficulties) and styles of learning which the student openly and readily reveals. Students thus offer enormous potential if one is able to find and provide the unique conditions within which they will learn best. Students have unique connections to the school, with some experiencing important disconnect brought upon by an important dissociation between the rules of conduct and expectations between the school and those in the home.

## ADS 1

**Students want;**

SOCIO : Goal : Students : younger students want to have parents presence in school

SOCIO : Goal : Students : students having recently arrived to Canada want to have parents presence in school

**Students are identified;**

As a representation of risk for the future

SOCIO : Identity : Students : are often overweight

As impressionable

SOCIO : Identity : Students : are malleable, receptive to change

As carriers of information (through time and space)

SOCIO : Identity : Students : inform parents

As lacking knowledge & experience

SOCIO : Identity : Students : are unaware of diverse foods & tastes

SOCIO : Identity : Students : do not know about food

SOCIO : Identity : Students : are unaware of diverse foods

As a diverse group

Young children are more inhibited than older children

Immigrant children want to link parents to school more than non-immigrant children

Young children want to link parents to school more than older children

Immigrant children's home environments have distinct traditions and customs

## Nutritionist 2 ; Victor Rousselot (St Henri) &amp; Ste Benoit (Ahunsic; Montréal Nord)

**Students want;**

SOCIO : Goal : Students : to be recognized, acknowledged

SOCIO : Goal : Students : older students want to learn about different people, new cultures, new customs

**Students are identified;**

In mutual influence with other students;

SOCIO : Identity : Students : may dominate or take over group activities

SOCIO : Identity : Students : may lack confidence & shy away from group activities

SOCIO : Identity : Students : may argue to assert place during group activities

SOCIO : Identity : Students : create a norm of acceptance and openness to new experience

As a representation of risk for the future

SOCIO : Identity : Students : consume too much unhealthy food

As carriers of information (through time and space)

SOCIO : Identity : Students : future consumers

SOCIO : Identity : Students : inform parents

As lacking knowledge & experience

SOCIO : Identity : Students : are unaware of diverse foods & tastes

SOCIO : Identity : Students : lack information about food & nutrition

As inhibited (reluctant of, fear of, unknown)

SOCIO : Identity : Students : tend to reject certain foods

SOCIO : Identity : Students : are inhibited by unknown food

SOCIO : Identity : Students : reject new foods (Younger children)

As impressionable  
SOCIO : Identity : Students : are malleable, receptive to change

Changing quickly  
SOCIO : Identity : Students : evolve quickly, change throughout the year

Are revealing  
SOCIO : Identity : Students : openly express likes and dislikes

As being disconnected;  
SOCIO : Identity : Students : may associate school with failure  
SOCIO : Identity : Students : may require motivation to attend school

Requiring certain conditions to learn  
SOCIO : Identity : Students : group dynamics can distract from subject  
SOCIO : Identity : Students : concrete experience with object heightens interest in subject  
SOCIO : Identity : Students : like to receive prizes  
SOCIO : Identity : Students : need to receive encouragement

Have diversity  
Older children are more curious about difference than younger children

Nutritionist 3 ; Ste Zotique (Ste Henri)

**Students want;**

SOCIO : Goal : Students : want to demonstrate abilities  
SOCIO : Goal : Students : want to demonstrate what they know  
SOCIO : Goal : Students : want show what they can do

**Students are identified;**

As carriers of information (through time and space)  
SOCIO : Identity : Students : inform parents

As a representation of risk for the future  
SOCIO : Identity : Students : consume too much unhealthy food

As lacking knowledge & experience  
SOCIO : Identity : Students : lack opportunities to prepare food  
SOCIO : Identity : Students : are unaware of diverse foods & tastes  
SOCIO : Identity : Students : lack information about food & nutrition

As impressionable  
SOCIO : Identity : Students : are malleable, receptive to change

Requiring certain conditions to learn  
SOCIO : Identity : Students : group dynamics can distract from subject  
SOCIO : Identity : Students : concrete experience with object heightens interest in subject  
SOCIO : Identity : Students : some may learn best through lecture  
SOCIO : Identity : Students : learn best through hands on experiences

In mutual influence with other students;  
SOCIO : Identity : Students : group dynamics can distract from subject

In mutual influence with teacher & school environment;  
SOCIO : Identity : Students : behaviour is influenced by teacher & school environment

Have diversity  
SOCIO : Identity : Students : have unique abilities or talents  
SOCIO : Identity : Students : may have natural interest with food

## Nutritionist 4 ; Ste Odile (Cartierville, Montreal Nord)

**Students want;**

SOCIO : Goal : Students : want to demonstrate abilities

SOCIO : Goal : Students : want to demonstrate what they know

**Students are identified;**

Are revealing

SOCIO : Identity : Students : openly express likes and dislikes

As lacking knowledge &amp; experience

SOCIO : Identity : Students : lack opportunities to prepare food

SOCIO : Identity : Students : are unaware of diverse foods &amp; tastes

SOCIO : Identity : Students : lack information about food &amp; nutrition

SOCIO : Identity : Students : may lack confidence in abilities

SOCIO : Identity : Students : may lack coordination

As carriers of information (through time and space)

Requiring certain conditions to learn

SOCIO : Identity : Students : enjoy learning through play

SOCIO : Identity : Students : learn by trial and error

SOCIO : Identity : Students : need to receive encouragement

SOCIO : Identity : Students : learn more through informed action (action situated in knowledge)

In mutual influence with teacher &amp; school environment;

SOCIO : Identity : Students : behaviour is influenced by teacher &amp; school environment

SOCIO : Identity : Students : are strongly influenced by teacher

Have diversity;

SOCIO : Identity : Students : have varied associations with food

Or have varied experiences with food

As inhibited (reluctant of, fear of, unknown)

SOCIO : Identity : Students : may be unwilling to try new foods

## Nutritionist 5 ; Jeanne leber (point st charles)

**Students want;**

SOCIO : Goal : Students : older students want activities that allow autonomy

SOCIO : Goal : Students : to be in action creating tangible objects

SOCIO : Goal : Students : younger students want to link parents to school

**Students are identified;**

In mutual influence with teacher &amp; school environment;

SOCIO : Identity : Students : behaviour is influenced by teacher &amp; school environment

SOCIO : Identity : Students : are strongly influenced by teacher

Requiring certain conditions to learn

SOCIO : Identity : Students : group dynamics can distract from subject

In mutual influence with other students;

SOCIO : Identity : Students : may argue to assert place during group activities

As impressionable

SOCIO : Identity : Students : are malleable, receptive to change

SOCIO : Identity : Students : are responsible for their own learning

Are revealing

SOCIO : Identity : Students : openly express likes and dislikes

SOCIO : Identity : Students : carriers of habits

As carriers of information (through time and space)

As lacking knowledge & experience

SOCIO : Identity : Students : are unaware of diverse foods & tastes

SOCIO : Identity : Students : lack information about food & nutrition

Requiring certain conditions to learn

SOCIO : Identity : Students : learn more through informed action (action situated in knowledge)

Have diversity

SOCIO : Identity : Students : may be unwilling to try new foods

SOCIO : Identity : Students : may have a special ability to prepare food

SOCIO : Identity : Students : may have desire to help other students

SOCIO : Identity : Students : may have a particular interest with food

SOCIO : Identity : Students : may have prior experience preparing food

Have more or less experience preparing food

Have special abilities

Have particular interest

Can be more or less ready to try new foods

#### Nutritionist 6 ; Petite Bourgogne (st henri)

##### **Students want;**

SOCIO : Goal : Students : older students want activities that allow autonomy

SOCIO : Goal : Students : to be in action creating tangible objects

SOCIO : Goal : Students : want to demonstrate abilities

SOCIO : Goal : Students : want to demonstrate what they know

SOCIO : Goal : Students : want to discover; new foods, new cultures

SOCIO : Goal : Students : younger students want to link parents to school

##### **Students are identified;**

As lacking knowledge & experience

SOCIO : Identity : Students : are unaware of diverse foods & tastes

SOCIO : Identity : Students : lack opportunities to prepare food

SOCIO : Identity : Students : lack information about food & nutrition

As representing risk for the future

SOCIO : Identity : Students : consume too much unhealthy food

As carriers of information (through time and space)

SOCIO : Identity : Students : carriers of habits

As inhibited (reluctant fear of, unknown)

SOCIO : Identity : Students : are inhibited toward unknown food

As impressionable

SOCIO : Identity : Students : are malleable, receptive to change

Changing quickly

SOCIO : Identity : Students : evolve quickly, change throughout the year

Are revealing

SOCIO : Identity : Students : openly express likes and dislikes

In mutual influence with teacher & school environment;

SOCIO : Identity : Students : are strongly influenced by teacher

In mutual influence with other students;

SOCIO : Identity : Students : may argue to assert place during group activities

SOCIO : Identity : Students : may dominate or take over group activities

SOCIO : Identity : Students : may lack confidence & shy away from group activities

Requiring certain conditions to learn

SOCIO : Identity : Students : group dynamics can distract from subject

SOCIO : Identity : Students : learn more through informed action (action situated in knowledge)

SOCIO : Identity : Students : need to receive encouragement

Having diversity

SOCIO : Identity : Students : may have a special ability to prepare food

SOCIO : Identity : Students : have varied associations with food

As being disconnected;

SOCIO : Identity : Students : may associate school with failure

SOCIO : Identity : Students : may require motivation to attend school

#### Nutritionist 7 ; Luger Duverney (St Henri)

##### **Students want;**

SOCIO : Goal : Students : to be in action creating tangible objects

SOCIO : Goal : Students : want to demonstrate abilities

SOCIO : Goal : Students : want to discover; new foods, new cultures

SOCIO : Goal : Students : want to talk about what they know

##### **Students are identified;**

Are revealing

SOCIO : Identity : Students : openly express likes and dislikes

As lacking knowledge & experience

SOCIO : Identity : Students : are unaware of diverse foods

S SOCIO : Identity : Students : lack information about food & nutrition

Requiring certain conditions to learn

SOCIO : Identity : Students : enjoy learning less through lecture

SOCIO : Identity : Students : learn best through hands on experiences

SOCIO : Identity : Students : prior exposure to subject builds curiosity for subject

SOCIO : Identity : Students : behaviour can be unpredictable

SOCIO : Identity : Students : behaviour and attention interacts with environmental conditions

In mutual influence with other students;

SOCIO : Identity : Students : learn through collective experience

As carriers of information (through time and space)

SOCIO : Identity : Students : inform parents

SOCIO : Identity : Students : carry information through time

SOCIO : Identity : Students : carriers of habits

As inhibited (reluctant fear of, unknown)

SOCIO : Identity : Students : may be unwilling to try new foods

SOCIO : Identity : Students : build trust over time

SOCIO : Identity : Students : disadvantaged clientel ... do not have a varied diet

SOCIO : Identity : Students : younger students reject new foods more than older students

#### ADS ; Ste Zotique

##### **Students want;**

SOCIO : Goal : Students : want to talk about what they know

SOCIO : Goal : Students : younger students and foreign students want to link parents to school

##### **Students are identified;**

As impressionable

SOCIO : Identity : Students : are malleable, receptive to change

Requiring certain conditions to learn

SOCIO : Identity : Students : group dynamics can distract from subject

SOCIO : Identity : Students : enjoy learning less through lecture

In mutual influence with teacher & school environment;

SOCIO : Identity : Students : behaviour is influenced by teacher & school environmental

As carriers of information (through time and space)

SOCIO : Identity : Students : inform parents

As lacking knowledge & experience

SOCIO : Identity : Students : lack information about food & nutrition

SOCIO : Identity : Students : lack spirit or sense of collectiveness

SOCIO : Identity : Students : may live distinct culture and traditions at home



## APPENDIX H

Example of a tables illustrating strategies aimed at linking nutritionists' goals with those of teachers, students and parents

Table 1. Strategic actions – Program Entities – Aimed at School Children

Strategy – Interestement	Tool – Device - Entity	<u>Nutritionist goals</u> Student pre-occupations, needs
Reinforcing collective accomplishments Adapting expectations to individual students Assuring that each students contributes Finding students' individual abilities Reinforcing individual accomplishments	Recipe Food Small groups of children Teacher participation	<u>To create student-school attachments</u> - to feel included - to have successful school experiences
Placing students in action preparing food Placing students in control Providing appropriate challenge Leaving room for error	Recipe Food Kitchen utensils Teacher participation	<u>To advance capacity to manipulate food</u> - acquire food preparation and healthy eating know-how <u>To provide new learning conditions</u> - hands-on experiences - to create tangible objects <u>To provide opportunity to build independence</u> - to build autonomy
De-emphasizing nutritional composition of food Talking about culinary traditions Talking about food critically Talking about ecological character of food Talking about the connection between food and different cultures	Food and Nutrition information Teacher	<u>To create links between students and food apart from good bad food</u> - to be 'in the know' - acquire current & updated information
Demonstrating new foods Insisting all students taste recipe Providing new tastes Building trust	Food Teacher	<u>To create (instil) openness among students for new experiences with food</u> - make discovery, have new experiences
Involving students with tasting or smelling, or inquiring about food items prior to workshop	Food and Nutrition information in form of Preparatory Activity Teacher participation	<u>Creating well functioning workshop by stimulating curiosity, maximising readiness, minimizing distraction</u>
Providing new information about food Presenting nutritional composition of food Re-informing on popular notions of food Providing knowledge on nutrient effects in body Asking students to sit and listen Dialoguing with students Playing games	Food and Nutrition information	<u>Raising awareness on good and bad effects of food on body</u>

Making student co-dependent	Recipe	<u>Providing students with an opportunity for independent action</u>  <u>Creating attachments in school</u> Students need to assert themselves in a group Students need to share leadership
		<u>Providing opportunity for self-expression</u> Students need to show unique talents and abilities
		<u>Influence eating practices in home</u> - students need to connect with parents

Table 2. Strategic actions – Program Entities – Aimed at Teachers

Strategy – Intersement	Tool – Device - Entity	<u>Nutritionist goals</u> - teacher pre-occupations, needs
Being available to respond to teachers' questions Providing professional nutrition advice [Preparing samples uniquely for teachers]*  (Explaining student benefits to teachers)**	Food & Nutrition information as nutritionist expertise	<u>Inform school about food and nutrition</u> - provide health education - acquire food & nutrition information
Integrating collaborative learning techniques Placing students in collaborative learning  Bringing math & language elements to teachers attention	Hands-on food preparation activity  Recipe written down on paper	<u>Connect food and nutrition information to educational program</u> - deliver newer components of educational reform - evaluating newer components of educational reform - deliver core curricular material
Sharing animation with teachers Seeking class behaviour solutions with teachers Sharing class behaviour impressions with teachers Following teachers' advice	Hands-on food preparation activity  One on one meetings with teacher and nutritionist	<u>Obtain teacher input during workshop</u> - maintain good class behaviour

<p>Putting completed class work on display  Circulating teachers' practices between teachers  Circulating pedagogic practices between schools  Learning new pedagogic techniques  Suggesting new pedagogic techniques</p>	<p>Food &amp; Nutrition information as preparatory activity</p> <p>One on one meetings with teacher and nutritionist</p> <p>PC-PR Nutritionist Team</p> <p>Curriculum knowledge – pedagogic expertise</p>	<p><u>To have teachers use materials</u></p> <ul style="list-style-type: none"> <li>- maintain favourable image</li> <li>- stay up to date</li> </ul>
<p>Attending CE meetings  <i>Obtaining informal relationships***</i>  Running meetings with teachers &amp; direction  Seeking pedagogical advisement from teachers</p>	<p>Regular school meetings</p> <p>Curriculum knowledge – pedagogic expertise</p>	<p><u>Obtain teacher input with materials</u></p> <ul style="list-style-type: none"> <li>- maintain control on pedagogic content of projects</li> <li>- protect professional knowledge</li> </ul>
<p>Providing ready-to-go activities  Complementing teacher lessons  Accepting shorter workshop time  Not imposing preparatory activity</p>	<p>Curriculum knowledge – pedagogic expertise</p>	<p><u>Provide a resource, be self sufficient, self contained</u></p> <ul style="list-style-type: none"> <li>- needing new resources</li> <li>- lacking time, overburdened</li> </ul>
<p>Inviting parents to nutrition workshop  Becoming aware of parents personal life</p>	<p>Invitations to parents</p> <p>Teachers</p>	<p><u>Obtain parental participation</u></p> <ul style="list-style-type: none"> <li>- connecting with parents</li> </ul>
<p>Building trust  Becoming aware of parent-teacher relations  Offering input on parent-teacher relations  Sharing lunch time meals  Attending social events</p>	<p>Staff room</p>	<p><u>Obtain informal relationships with teachers</u></p> <ul style="list-style-type: none"> <li>- develop trusting and supportive relationships with colleagues</li> </ul>

\* [ interessement strategies utilised toward the achievement of one goal can be counterproductive towards the achievement of another goal]

\*\* (interessement strategies can bypass the pre-occupations of the teachers, and respond uniquely to the Nutritionists' goals)

\*\*\* *Interessement strategies towards one goal, can actually also be goals and thus require interessement strategies.*

Table 3. Strategic actions – Program Entities – Aimed at Parents

Strategy – Interessement	Tool – Device - Entity	<u>Nutritionist goals</u> Parental pre-occupations, needs
Inviting parental participation with workshop Encouraging parents to participate in upcoming outings Showing parent positive side of school  Becoming familiar with parent private life Building trust  Providing access to teacher Easing understanding with teacher  Giving parent opportunity to take leadership  Introducing parents to ADS	Teacher participation Circulation of information Nutritionist	<u>Build parent-school relationship</u> <u>Build student-school relationship</u> - needing to improve connections to school - needing to build positive experiences with school
Inviting parents to student presentations Inviting parental participation with workshop  Providing parents with an activity to complete with child  Child showing off accomplishments to parent	Written recipe Sample Teacher participation Students	<u>Build child-parent relationship</u> - needing to improve connections to child - needing inexpensive activities to attach to child
Child informing parent on healthy choices  Giving parents more information about nutrition	Students	<u>Build child-food healthy relationship</u> - needing to learn how to pass on healthy eating to child

## APPENDIX I

Examples of the final template or 'master lists' for three workshop components: the food preparation, demo/instructive component prior to the food preparation and the theory or formal lesson

Template A

‘Master list’ of practices which occurred during  
Food preparation component of workshop

Building healthy eating knowledge and know-how;

1. directs students through the proper interpretation of recipe by responds to question (measurement, procedure, manipulation) providing direct answer
2. directs students through the proper interpretation of recipe by redirecting students through a procedure by interrupting or by asking a question
3. modifies or correct a manipulation procedure (i.e. showing how to do or how to do better).
4. directs students to complete food preparation (i.e. tells students to get on to the next step, what to do next, to put things away, to sit down, to clean tables, to wait)
5. facilitates the completion of the food preparation by placing food items and tools directly on workgroup table
6. facilitates the completion of the food preparation by pre-preparing food items (i.e. cutting, peeling)
7. facilitates the completion of the food preparation by removing a procedure by substituting an ingredient
8. Divides the workgroup tasks for students
9. Refers positively to individual abilities
10. Refers to nutritive value of food item

Guiding students toward discovering food in new ways;

1. Enlarges the space for recipe completion beyond immediate work tables to other places within the classroom
2. Provides a new food fact
3. Involves students in finding solutions by responding to question by referring student back to recipe
4. Refers students to a new smell, texture, taste
5. Tells students that errors are ok because they are learning

Highlighting collective success and identity;

1. Involves students in finding solutions by responding by referring question to students
2. talks about working together, sharing, taking turns, cooperation
3. Reminds about roles & responsibilities by asking students if they are respecting their role
4. Reminds about roles & responsibilities by correcting student behaviour based upon their role
5. Reminds about roles & responsibilities by asking students to remind one another of their roles
6. Reminds about autonomy by refusing to respond to question
7. Refers positively to workgroup functioning

Providing Usable and applicable information;

8. Identifies an ingredient as being at students home
9. Identifies a tool or alternative tool which can be used in home
10. identifies possible adaptations and alterations which can be tried at home

Connecting the nutrition workshop into the teacher's timetable;

1. asks class if they have completed the preparatory activity
2. uses teachers responses, commentaries and questions in content of lesson

Connecting the educational institution with nutrition education;

1. asks class if they have read the recipe
2. incorporates collective learning by naming roles and explaining responsibilities
3. identifies new vocabulary and/or mathematics in recipe

### Template B

‘Master list’ of practices which occurred during  
Instructive component (i.e. prior to food preparation) of workshop

Building healthy eating knowledge and know-how;

1. directs students on how to apply the recipe by identifying major procedures of recipe
2. directs students on how to apply the recipe by identifying the major steps of recipe
3. directs students on how to apply the recipe by identifying how to prepare a particular food item
4. directs students on how to understand the recipe by identifying a new terminology
5. directs students on how to understand the recipe by identifying measurements in the recipe
6. asks class if they have read recipe
7. identifies new and/or familiar food items
8. identifies new and/or familiar tools
9. identifies nutritive value of food item(s)
10. Identifies hygiene
11. Identifies safety

Guiding students toward discovering food in new ways;

1. enlarges the space for recipe completion beyond immediate work tables to other places within the classroom
2. asks students questions about procedures or vocabulary
3. involves students in identifying food items and ingredients
4. asks students to demonstrate one or more procedures
5. refers students to anticipate a new smell, texture, taste
6. asks students about experience with food item(s)

Highlighting collective success and identity;

1. talks about working together, sharing, taking turns, cooperation



2. allows students some freedom to choose their workgroups
3. allows students to choose their workgroups
4. refers to roles & responsibilities
5. reminds students of autonomy
6. refers positively to previous workshop functioning

Providing Usable and applicable information;

1. identifies possible adaptations and alterations which can be tried at home

Connecting the nutrition workshop into the teacher's timetable;

3. asks class if they have completed the preparatory activity
4. uses teachers responses, commentaries and questions in content of lesson

Connecting the educational institution with nutrition education;

4. asks class if they have read the recipe
5. incorporates collective learning by naming roles and explaining responsibilities
6. identifies new vocabulary and/or mathematics in recipe

Template C

‘Master list’ of practices which occurred during  
the theory or formal lesson component of workshop

Building healthy eating knowledge and know-how;

1. Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre
2. Identifies nutritional composition of food in terms of; nutrient quantities
3. Relates nutritional value in food to health effects on body; names diseases
4. Identifies nutritional composition of food in terms of Canadian Food Guide
5. Relates the food to common consumption practices
6. Relates the food to individual students' consumption practices
7. Situates the food in terms of cookery – recipes

Guiding students toward discovering food in new ways;

1. Relates the food to alternative dietary practices– religion, culture, vegetarianism
2. Relates the food to its use in language and tradition
3. Discusses the sensory experience associated with the food – taste, smell
4. Discusses the food in terms of its plant biology – cultivation, classifications
5. Discusses food in terms of world geography and climate
6. Discusses the food as an consumer product – corporation, marketing strategies
7. Discusses the food in terms of its manufacture – as an industrial product
8. Identifies the cost of food
9. Relates the food to a personal experience

Highlighting collective success and identity;

1. Involves students by discussing prepared exercise
2. Involves students by asking questions and waiting for their response
3. Uses students responses, commentaries and questions in content of lesson
4. Students contribution appears to be well distributed among class

Connecting the nutrition workshop into the teacher's timetable;

1. uses teachers responses, commentaries and questions in content of lesson

Connecting the educational institution with nutrition education;

1. identifies new vocabulary and/or mathematics in recipe

APPENDIX J

Analytic Grid

Table I. Nutrition workshop observation analytic grid for Nutritionists A and B

Table I. <u>Nutrition workshop observation analytic grid for Nutritionists A and B</u>					
Theme of workshop and number of observations;	A : Five (n=5) observations in total: "Fast Food" (n=2); "Cabbage" (n=3). B : Five (n=5) observations in total: "Tofu" (n=1), "Fast Food" (n=1); "Cabbage" (n=3).				
Average total duration of workshop (variation);	A : 75 (+/- 3) minutes B : 70 (+/- 4) minutes				
Average number of students (variation)	A : 17 (+/- 2) B : 24 (+/- 2)				
Workshop component; Ordering of components; n/a = workshop component not included	Theory A : 1st B : 1st	Game A : 2 <sup>nd</sup> B : 2 <sup>nd</sup> or n/a	Instruction A : 3rd B : 3rd	Practice A : 4th B : 4th	Tasting A : 5th B : 5th
Average duration (range) minutes; n/a - workshop component was not always included	A : 25 (21-29) B : 26 (17-35)	A : 7 (5-14) B : n/a (0-8)	A : 2.6 (4-1) B : 5 (2-12)	A : 29 (22 – 38) B : 26 (25 – 27)	A : 8 (5-12) B : 9 (7-12)
Average number of students per workgroup table (range)				A : 6.0 (5.0 – 6.3) B : 6.0 (5.5 – 6.5)	
<b>Building Alliances with students;</b>					
Reinforcing familiar connections with food; <i>- defined by nutritionists actions to build healthy eating knowledge and know-how by referring to the nutritional value of food</i>	A : Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre (const) A : Identifies nutritional composition of food in terms of; nutrient quantities (const) A : Identifies nutritional composition of food in terms of	A : Identifies nutritional composition of food in terms of; nutrient quantities (var)	A : Directs students on how to apply the recipe (const); - identifies major procedures of recipe - identifies the major steps of recipe A : Identifies hygiene (var)	A : Directs students through the proper interpretation of recipe (const); - responds to question (measurement, procedure, manipulation) providing direct answer A : Modifies or correct a manipulation procedure (const); - showing how to do or how to do	-

<p><i>(i.e. quantity or quality) or the technical meaning of food (i.e. an instructional or manipulation tool)</i></p>	<p>Canadian Food Guide (var)  A : Relates nutritional value in food to health effects on body; names diseases (var)  A : Situates the food in terms of cookery – recipes (const)</p> <p>B : Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre (const)  B : Relates nutritional value in food to health effects on body; names diseases (var)  B : Identifies nutritional composition of food in terms of Canadian Food Guide (var)  B : Relates the food to individual students' consumption practices (const)  B : Situates the food in terms of cookery – recipes (var)</p>		<p>A : Identifies safety (var)</p> <p>B : Identifies nutritive value of food item(s) (var)  B : Identifies hygiene (var)  B : Identifies safety (var)</p>	<p>better  A : Directs students to complete food preparation(const);  - tells students to get on with an follow-up step  - responds to a question directly  A : Facilitates the completion of the food preparation (const);  - placing food items and tools directly on workgroup table</p> <p>B : Directs students through the proper interpretation of recipe (const);  - responds to question (measurement, procedure, manipulation) providing direct answer  B : Modifies or correct a manipulation procedure (const);  - showing how to do or how to do better  B : Facilitates the completion of the food preparation(const);  - pre-preparing food items (i.e. cutting, peeling)</p>	
<p><b>Creating new connections with food;</b>  <i>- defined by nutritionists actions to guide students toward discovery of the diverse meanings of food (social, ecological, industrial, or commercial)</i></p>	<p>A : Relates the food to its use in language and tradition (var)  A : Discusses the sensory experience associated with the food – taste, smell (const)  A : Discusses the food in terms of its plant biology – cultivation, classifications (var)  A : Discusses food in terms of world geography and climate (var)</p>	<p>A : Discusses the food in terms of its plant biology – cultivation, classifications (var)  A :</p>	<p>B : Asks students questions about procedures or vocabulary (const)</p>	<p>A : Involves students in finding solutions (const);  - responds to question by referring student back to recipe  A : Refers positively to individual abilities (const)</p> <p>B : Involves students in finding solutions (const);  - responds to question by referring</p>	<p>A : Identifies particularities in taste (spice, salt, herb) (const)  A : Asks students individually if they liked recipe or if they tasted recipe (const)</p>

<p><i>and its potential to build their sense of self-identity and achievement.</i></p>	<p>A : Discusses the food as a consumer product – corporation, marketing strategies (var)  A : Relates the food to common consumption practices (var)  A : Involves students by asking questions and waiting for their response (const)  A : Students contribution appears to be well distributed among class (const)</p> <p>B : Relates the food to alternative dietary practices– religion, culture, vegetarianism (var)  B : Relates the food to its use in language and tradition (var)  B : Discusses the sensory experience associated with the food – taste, smell (const)  B : Discusses the food in terms of its plant biology – cultivation, classifications (var)  B : Discusses food in terms of world geography and climate (var)  B : Discusses the food as a consumer product – corporation, marketing strategies (var)  B : Discusses the food in terms of its manufacture – as an industrial product (var)  B : Discusses the food as a consumer product – corporation, marketing strategies (var)  B : Identifies the cost of food (var)  B : Relates the food to a personal experience (const)  B : Involves students by asking questions and waiting for their</p>	<p>Recognizes individual accomplishment (var)</p> <p>B : Discusses the food in terms of its plant biology – cultivation, classifications (var)  B : Recognizes individual accomplishment (var)</p>		<p>student back to recipe  B : Refers students to a new smell, texture, taste (const)  B : Identifies an error in measurement or following procedure (var)</p>	<p>B : Identifies particularities in taste (spice, salt, herb) (const)  B : Asks students individually if they liked recipe or if they tasted recipe (const)  B : Expresses pleasure that students are tasting (const)  B : Expresses displeasure that student is not tasting (var)</p>
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	response (const) B : Relates the food to common consumption practices (var)				
Expanding interpersonal connections <i>- defined by nutritionists actions to support students role acquisition among classmates and/or family.</i>	A : Involves students by discussing prepared exercise (const) B : Involves students by discussing prepared exercise (const) B : Uses students responses, commentaries and questions in content of lesson (const) B : Students contribution appears to be well distributed among class (const)	A: Identifies group accomplishment (const) B: Identifies group accomplishment (var)	B : Talks about working together, sharing, taking turns, cooperation (const) B : Allows students to choose their workgroups (const)	A : Divides the workgroup tasks for students (const) A : Identifies an ingredient as being at students home (var) A : Identifying to food sample to be taken home (const)  B : Involves students in finding solutions (const); - responds by referring question to students B : Refers positively to individual abilities (const) B : Talks about working together, sharing, taking turns, cooperation (const) B : Identifying to food sample to be taken home (const)	A : Casual conversation develops between students and nutritionists and drifts beyond subject of food (const) A : Identifies possible adaptations and alterations which can be tried at home (const)  B : Identifies possible adaptations and alterations which can be tried at home (const)
Misc.	B : Revisits content from a previous workshop (var)				
<b>Building Alliances with School;</b>					
Connecting the nutrition workshop into the teachers timetable <i>- defined by the actions taken by the nutritionist to engage the teacher or</i>	A : T is pro-active reminding about silence, taking turns, raising hand etc. (const) A : T appears to be listening and interested in lesson (const) A : T addresses the class with personal antidote (var) A : T supplements lesson with		A : T is pro-active reminding about silence, taking turns etc. (const)  B : T is pro-active reminding about silence, taking turns etc.		

<p><i>actions taken by the teacher suggesting that they are engaged with the nutrition workshop, where engagement refers to an appreciation of the workshop whereby it is accepted as part of the timetable and may be used by the teacher to supplement education curriculum.</i></p>	<p>extra information (var)</p> <p>B : T is pro-active reminding about silence, taking turns, raising hand etc. (var)</p> <p>B : T appears to be listening and interested in lesson (var)</p>		(const)		
<p><b>Connecting the educational institution with nutrition education</b>  <i>- defined by the actions taken by the nutritionist or the teacher which suggest that the nutrition workshop is used as a unique and essential part of the educational curriculum; In this respect, the workshop responds to the explicit needs of the school to build social competencies among students, partnerships with parents and a health education curriculum.</i></p>	<p>A : T has prepared class by completing preparatory activity (const)</p> <p>A : T interjects by directing a question at the class to verify comprehension (var)</p> <p>A : Parent(s) present (var)</p> <p>A : N introduces parents who are present (const)</p> <p>B : T has prepared class by completing preparatory activity (const)</p> <p>B : Parent(s) present (var)</p> <p>B : P addresses the class with personal antidote (var)</p>		-		



Table 2. Nutrition workshop observation analytic grid for Nutritionists C and D

Table 2. Nutrition workshop observation analytic grid for Nutritionists C and D						
Theme of workshop and number of observations;	C : Five (n=3) observations in total: "Fast Food" (n=1); "Cabbage" (n=2). D : Five (n=2) observations in total: "Fast Food" (n=1); "Cabbage" (n=1).					
Average total duration of workshop (variation);	C : 80 (+/- 5) minutes D : 75 (+/- 20) minutes					
Average number of students (variation);	C : 21 (+/- 5) D : 23 (+/- 1)					
Workshop component;	Demo / Instruction	Practice	Return	Theory	Game	Tasting
Sequence, ordering or component; n/a = workshop component not included	C : 1 <sup>st</sup> or 3 <sup>rd</sup> D : 1 <sup>st</sup> or 3 <sup>rd</sup>	C : 2 <sup>nd</sup> D : 2 <sup>nd</sup> or 4 <sup>th</sup>	C : n/a or last (may be combined with tasting) D : n/a	C : 3 <sup>rd</sup> or 1 <sup>st</sup> D : 3 <sup>rd</sup> or 1 <sup>st</sup> (may be combined with tasting)	C : 4 <sup>th</sup> or n/a D : 2 <sup>nd</sup> or n/a	C : last (may be combined with a return on functioning) D : last (may be combined with theory)
Average duration (range) minutes n/a - workshop component was not always included	C : 8 (4-12) D : 10 (8-12)	C : 40 (35 – 45) D : 41 (41- 42)	C : n/a D : n/a	C : 19 (13 – 25) D : combined with tasting	C : n/a (0 – 6) D : n/a (0-10)	C : 8 (5 – 12) D : 12 (10 – 14)
Average number of students per workgroup table (range)		C : 5.8 (4.3-6.5) D : 4.7 (4.6-4.8)				
Building Alliances with students;						
Reinforcing familiar connections with food; <i>- defined by nutritionists actions to build healthy eating knowledge and know-how by referring to the nutritional value of food (i.e. quantity or quality)</i>	C : Directs students on how to understand the recipe (const); - Identifies a new terminology - Identifies measurements in the recipe	C : Directs students through the proper interpretation of recipe (const); - responds to question (measurement, procedure, manipulation) providing direct answer C : Modifies or correct a manipulation procedure (const);	C : revisits importance to follow recipe procedure in order (var)	C : Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre (const) C : Relates nutritional value in food to	C : Identifies nutritional composition of food in terms of; nutrient quantities (var) D : Identifies nutritional	C : Identifies particularities in nutritive value (fat, fibre, vitamin) (var)

<p><i>or the technical meaning of food (i.e. an instructional or manipulation tool)</i></p>	<p>C : Directs students on how to apply the recipe (const); - identifies how to prepare a particular food item C : Identifies new and/or familiar tools (const) C : Identifies safety (var)</p> <p>D : Directs students on how to apply the recipe (const); - identifies how to prepare a particular food item</p>	<p>- showing how to do or how to do better C : Directs students to complete food preparation (const); - tells students to get on to the next step, what to do next, to put things away, to sit down, to clean tables, to wait - responds to a question directly C : Facilitates the completion of the food preparation (const); - placing food items and tools directly on workgroup table</p> <p>D : Directs students to complete food preparation (const); - tells students to get on to the next step, what to do next, to put things away, to sit down, to clean tables, to wait</p>		<p>health effects on body; names diseases (var) C : Situates the food in terms of cookery – recipes (var)</p> <p>D : Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre (const) D : Relates nutritional value in food to health effects on body; names diseases (var) D : Identifies nutritional composition of food in terms of Canadian Food Guide (const)</p>	<p>composition of food in terms of; nutrient quantities (var)</p>	
<p>Creating new connections with food; <i>- defined by nutritionists actions to guide students toward discovery of the diverse meanings of food (social, ecological, industrial, or commercial) and its potential to build their sense of self-identity and achievement.</i></p>	<p>C : Identifies new and/or familiar food items (const) C : Involves students in identifying food items, ingredients and procedures (const) C : Asks students to demonstrate one or more procedures (const) C : Refers students to</p>	<p>C : Refers positively to individual abilities (const) C : Involves students in finding solutions (const); - responds to question by referring student back to recipe C : Inquires about advancement of recipe (const) C : Asking students about what they are doing (const) C : Refers students to a new smell, texture, taste (const) C : Identifies an error in measurement or following procedure (var)</p>	<p>C : Involves students in finding solutions (const); - asks students to provide feedback on the functioning</p>	<p>C : Discusses the sensory experience associated with the food – taste, smell (const) C : Discusses the food in terms of its plant biology – cultivation, classifications (var) C : Discusses food in terms of world geography and climate (var) C : Discusses the</p>	<p>C : Discusses the food in terms of its plant biology – cultivation, classifications (var) C : Recognizes individual accomplishment (var) D : Discusses the food in terms of its</p>	<p>C : Identifies particularities in look (color, size of pieces) (var) C : Expresses displeasure that student is not tasting (var) C : Asks students individually if they liked recipe or if they tasted recipe (const)</p>

	<p>anticipate a new smell, texture, taste (const)</p> <p>D : Enlarges the space for recipe completion beyond immediate work tables to other places within the classroom (const)</p> <p>D : Involves students in identifying food items and ingredients (const)</p>	<p>C : Provides a new food fact (const)</p> <p>D : Refers positively to individual abilities (const)</p> <p>D : Enlarges the space for recipe completion beyond immediate work tables to other places within the classroom (const)</p> <p>D : Involves students in finding solutions (const); - responds to question by referring student back to recipe</p> <p>D : Identifies an error in measurement or following procedure (const)</p>		<p>food as a consumer product – corporation, marketing strategies (var)</p> <p>C : Discusses the food as a consumer product – corporation, marketing strategies (var)</p> <p>C : Relates the food to a personal experience (var)</p> <p>C : Relates the food to individual students’ consumption practices (const)</p> <p>C : Relates the food to common consumption practices (var)</p> <p>D : Relates the food to its use in language and tradition (var)</p> <p>D : Discusses the food in terms of its plant biology – cultivation, classifications (var)</p> <p>D : Discusses food in terms of world geography and climate (var)</p> <p>D : Discusses the food as a consumer product – corporation, marketing strategies</p>	<p>plant biology – cultivation, classifications (var)</p> <p>D : Recognizes individual accomplishment (var)</p>	
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				(var)		
Expanding interpersonal connections - defined by nutritionists actions to support students role acquisition among classmates and/or family.	<p>C : Refers to roles &amp; responsibilities (const)</p> <p>C : Reminds students of autonomy (const)</p> <p>D : Talks about working together, sharing, taking turns, cooperation (const)</p> <p>D : Allows students to choose their workgroups (const)</p> <p>D : Refers to roles &amp; responsibilities (const)</p>	<p>C : Involves students in finding solutions (const); - responds by referring question to students</p> <p>C : Reminds about roles &amp; responsibilities (const)</p> <p>C : Refers positively to workgroup functioning (const)</p> <p>C : Identifies a tool or alternative tool which can be used in home (var)</p> <p>D : Involves students in finding solutions (const); - responds by referring question to students</p> <p>D : Talks about working together, sharing, taking turns, cooperation (const)</p> <p>D : Reminds about roles &amp; responsibilities (const); - asks students if they are respecting their role - corrects student behaviour based upon their role - asks students to remind one another of their roles</p> <p>D : Refers to food items as needing to be shared among entire class (const)</p> <p>D : Identifies a tool or alternative tool which can be used in home (var)</p>	<p>D : Involves students in finding solutions (const); - asks students to provide feedback on the functioning</p> <p>D : Identifies examples of working together, sharing, taking turns, cooperation (const)</p> <p>D : Talks about autonomy (const)</p> <p>D : Refers positively to workgroup functioning (const)</p>	<p>C : Involves students by discussing prepared exercise (var)</p> <p>C : Involves students by asking questions and waiting for their response (const)</p> <p>C : Uses students responses, commentaries and questions in content of lesson (const)</p> <p>C : Students contribution appears to be well distributed among class (var)</p> <p>D : Involves students by asking questions and waiting for their response (var)</p>		<p>C : Identifies particularities in look or taste between workgroup samples (const)</p>
Misc		C : Manages student who does not want to participate				

		D : Manages student who wants to change workgroup				
<b>Building Alliances with School</b>						
<p>Connecting the nutrition workshop into the teachers timetable  <i>- defined by the actions taken by the nutritionist to engage the teacher or actions taken by the teacher suggesting that they are engaged with the nutrition workshop. where engagement refers to an appreciation of the workshop whereby it is accepted as part of the timetable and may be used by the teacher to supplement education curriculum.</i></p>	<p>C : T repeats N instructions (const)            C : N often reminds students about silence, taking turns, raising hand etc. (const)            C : T is immediately reactive with discipline when N is unsuccessful (const)            C : N identifies math and new vocabulary in recipe (const)</p> <p>D : N often reminds students about silence, taking turns, raising hand etc. (const)</p>			<p>C : T is pro-active reminding about silence, taking turns, raising hand etc. (const)            C : N often reminds students about silence, taking turns, raising hand etc.(const)            C : T is reactive with discipline when N is unsuccessful (const)            C : Elaborates upon teachers responses, commentaries and questions in content of lesson (var)</p> <p>D : T is physically or mentally absent at times            D : N often reminds students about silence, taking turns, raising hand etc.</p>		

<p>Connecting the educational institution with nutrition education  <i>- defined by the actions taken by the nutritionist or the teacher which suggest that the nutrition workshop is used as a unique and essential part of the educational curriculum; In this respect, the workshop responds to the explicit needs of the school to build social competencies among students, partnerships with parents and a health education curriculum.</i></p>	<p>C : N asks if class read recipe (const)  C : T has prepared class by reading rccipc, assigning S roles and workgroups (const)  C : N incorporates collective learning; namcs roles and explains responsibilities (const)    D : N asks if class read recipe (const)  D : N incorporates collective learning; namcs roles and explains responsibilities (const)</p>					
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Table 3. Nutrition workshop observation analytic grid for Nutritionists E and F-i and F-ii

Table 3. Nutrition workshop observation analytic grid for Nutritionists E and F-i and F-ii						
Theme of workshop and number of observations;	E : Five (n=6) observations in total: "Tofu" (n=3), "Fast Food" (n=3); F-i : Five (n=7) observations in total: "Tofu" (n=3), "Fast Food" (n=2); "Cabbage" (n=2). F-ii : Five (n=3) observations in total: "Fast Food" (n=2); "Cabbage" (n=1).					
Average total duration of workshop (variation);	E : 70 (+/- 15) minutes F-i : 58 (+/- 20) minutes F-ii : 85 (+/- 15) minutes					
Average number of students (variation);	E : 23 (+/- 2) F-i : 25 (+/- 5) F-ii : 21 (+/- 2)					
Workshop component; Ordering of component;  n/a = workshop component not included	Demo / Instruction E : 1st  F-i : 1st  F-ii : 1st	Practice E : 2 <sup>nd</sup>  F-i : 2 <sup>nd</sup>  F-ii : 2 <sup>nd</sup>	Return E : 3 <sup>rd</sup>  F-i : n/a  F-ii : 3rd or n/a	Theory E : 4 <sup>th</sup> (may be combined with tasting)  F-i : 3 <sup>rd</sup> (may be included with tasting)  F-ii : 4 <sup>th</sup>	Game E : 5 <sup>th</sup> or n/a  F-i : n/a  F-ii : 5 <sup>th</sup> or n/a	Tasting E : last (may be combined with return on function and theory)  F-i : last (may include theory)  F-ii : last
Average duration (range) minutes;  n/a - workshop component was not always included	E : 8 (4-14)  F-i : 13 (6-19)  F-ii : 7 (5-13)	E : 39 (22-52)  F-i : 32 (20-46)  F-ii : 43 (37-48)	E : 2 (1-3)  F-i : n/a  F-ii : n/a (0-3)	E : 13 (6 – 16)  F-i : n/a (0–15)  F-ii : 13 (8-19)	E : n/a (0-11)  F-i : n/a  F-ii : n/a (0-11)	E : 9 (5 – 15)  F-i : 10 (6 – 15) (may include theory)  F-ii : 8 (5-10)

Average number of students per workgroup table (range);		E : 5.8 (5.0-6.3) F-i : 6.5 (6.0-7.5) F-ii : 4.8 (4.6 – 5.3)				
<b>Building Alliances with students</b>						
<p>Reinforcing familiar connections with food; - <i>defined by nutritionists actions to build healthy eating knowledge and know-how by referring to the nutritional value of food (i.e. quantity or quality) or the technical meaning of food (i.e. an instructional or manipulation tool)</i></p>	<p>E : Directs students on how to apply the recipe (const); - identifies major procedures of recipe - identifies the major steps of recipe E : Asks class if they have read recipe (const) E : Identifies hygiene (var) E : Identifies safety (var)  F : directs students on how to apply the recipe (const); - identifies major procedures of recipe F : Directs students on how to understand the recipe (const); - identifies a new terminology - identifies measurements in the recipe</p>	<p>E : Directs students through the proper interpretation of recipe (const); - redirects students through a procedure by interrupting or by asking a question E : Modifies or correct a manipulation procedure (var); - showing how to do or how to do better E : Directs students to complete food preparation (const); - tells students to get on to the next step, what to do next, to put things away, to sit down, to clean tables, to wait E : Refers to nutritive value of food item (var)  F : Directs students through the proper interpretation of recipe (const) - responds to question (measurement, procedure, manipulation) providing direct answer - redirects students through a procedure by interrupting or by asking a question F : Modifies or correct a manipulation procedure</p>	-	<p>E : Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre (var) E : Relates nutritional value in food to health effects on body; names diseases (var) E : Identifies nutritional composition of food in terms of Canadian Food Guide (const) E : Situates the food in terms of cookery – recipes (var)  F-i : Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre (const) F-i : Identifies nutritional composition of food in terms of; nutrient quantities (var) F-i : Relates nutritional value in food to health effects on body; names diseases (var) F-i : Identifies nutritional composition of food in terms of Canadian Food Guide (var)</p>		<p>E : Returns to lesson plan with casual conversations (var)</p>



	<p>F : Identifies new and/or familiar tools (var)          F : Identifies hygiene (var)          F : Identifies safety (var)</p>	<p>- showing how to do or how to do better (const)          F - i : Directs students to complete food preparation (const)          - tells students to get on to the next step, what to do next, to put things away, to sit down, to clean tables, to wait          F - i: Facilitates the completion of the food preparation (const);          - pre-preparing food items (i.e. cutting, peeling)          - removing a procedure by substituting an ingredient</p>		<p>F-i : Relates the food to common consumption practices (var)           F-ii : Identifies nutritional composition of food in terms of; sugar, fat, salt, calories, vitamins, minerals, fibre (const)          F-ii : Identifies nutritional composition of food in terms of; nutrient quantities (var)          F-ii : Identifies nutritional composition of food in terms of Canadian Food Guide (const)          F-ii : Relates the food to common consumption practices (var)</p>		
<p>Creating new connections with food;          - defined by nutritionists actions to guide students toward discovery of the diverse meanings of food (social, ecological, industrial, or commercial) and its potential to build their sense of self-identity and</p>	<p>E : (var) asks students about experience with food item(s)          E : (var) refers students to anticipate a new smell, texture, taste          E : Enlarges the space for recipe completion beyond immediate work tables to other places within the classroom (const)          E : (var) Asks</p>	<p>E : Enlarges the space for recipe completion beyond immediate work tables to other places within the classroom          E : Involves students in finding solutions (const);          - responds to question by referring student back to recipe          E : Refers students to a new smell, texture, taste (const)          E : Refers positively to individual abilities (const)           F : Enlarges the space for recipe completion beyond immediate work tables to</p>	<p>E : Identifies an error in measurement or following procedure (var)          - uses the error to provide a lesson</p>	<p>E : Discusses the sensory experience associated with the food – taste, smell (var)          E : Discusses the food in terms of its plant biology – cultivation, classifications (var)          E : Discusses the food as an consumer product – corporation, marketing strategies (var)          E : Discusses the food in terms of its manufacture – as an industrial product (var)          E : Relates the food to individual students’ consumption practices (var)</p>		<p>E : Asks students individually if they liked recipe or if they tasted recipe (const)          E : Expresses pleasure that students are tasting (const)           F -i: Identifies particularities in taste (spice, salt, herb) (var)          F - i : Asks students collectively if they liked recipe or if they tasted recipe</p>

<p><i>achievement.</i></p>	<p>students questions about procedures or vocabulary</p> <p>F : Identifies new and/or familiar food items (var)</p> <p>F : (var) refers students to anticipate a new smell, texture, taste</p> <p>F : Asks students questions about procedures or vocabulary (var)</p> <p>F : Asks students to demonstrate one or more procedures (var)</p> <p>F : Enlarges the space for recipe completion beyond immediate work tables to other places within the classroom (const)</p>	<p>other places within the classroom (const)</p> <p>F : Identifies an error in measurement or following procedure (var)</p> <p>F : Refers students to a new smell, texture, taste (const)</p> <p>F - i : Involves students in finding solutions (const); - responds to question by referring student back to recipe</p> <p>F - i : Identifies an error in measurement or following procedure (var)</p> <p>F : Refers positively to individual abilities (const)</p>		<p>F-i : Relates the food to its use in language and tradition (var)</p> <p>F-i : Discusses the food in terms of its plant biology – cultivation, classifications (var)</p> <p>F-i : Discusses food in terms of world geography and climate (var)</p> <p>F-i : Discusses the food as an consumer product – corporation, marketing strategies (var)</p> <p>F-i : Discusses the food in terms of its manufacture – as an industrial product (var)</p> <p>F-i : Relates the food to a personal experience (var)</p> <p>F-i : Relates the food to individual students' consumption practices (var)</p> <p>F-ii : Discusses the food in terms of its plant biology – cultivation, classifications (var)</p> <p>F-ii : Discusses food in terms of world geography and climate (var)</p> <p>F-ii : Discusses the food as an consumer product – corporation, marketing strategies (var)</p> <p>F-ii : Relates the food to a personal experience (var)</p>	<p>(var)</p> <p>F - i : Expresses displeasure that student is not tasting (var)</p>
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				F-ii : Relates the food to individual students' consumption practices (var)		
<p>Expanding interpersonal connections - defined by nutritionists actions to support students role acquisition among classmates and/or family.</p>	<p>E : Refers to roles &amp; responsibilities (const) E : Refers to positively to previous workshop functioning (const) E : Reminds students of autonomy (const) E : referring to completing recipe at home (var)</p> <p>F : Refers to roles &amp; responsibilities (var) F : referring to taking recipe home (var)</p>	<p>E : Involves students in finding solutions (const); - responds by referring question to students E : Talks about working together, sharing, taking turns, cooperation (const) E : Reminds about roles &amp; responsibilities (const); - asks students if they are respecting their role - corrects student behaviour based upon their role E : Reminds about autonomy (const); - refuses to respond to question E : Refers positively to workgroup functioning (const)</p> <p>F : Involves students in finding solutions (const); - responds by referring question to students F - ii: Reminds about roles &amp; responsibilities (const); - asks students if they are respecting their role - corrects student behaviour based upon their role F-ii : Refers to food items as needing to be shared among entire class (var)</p>	<p>E : Involves students in finding solutions (const); - asks students to provide feedback on the functioning E : Identifies examples of working together, sharing, taking turns, cooperation (const) E : Talks about autonomy (const) E : Refers positively to workgroup functioning (const)</p> <p>F - i : Identifies an error in measurement or following procedure (var); - uses the error to highlight taste differences</p>	<p>E : Involves students by discussing prepared exercise (var) E : Involves students by asking questions and waiting for their response (const) E : Students contribution appears to be well distributed among class (const)</p> <p>F-i : Involves students by discussing prepared exercise (var) F-i : Involves students by asking questions and waiting for their response (const) F-i : Uses students responses, commentaries and questions in content of lesson F-i : Students contribution appears to be well distributed among class (const)</p> <p>F-ii : Involves students by discussing prepared exercise (var) F-ii : Involves students by asking questions and waiting for their response</p>		<p>E : Congratulates students on taste of final product (const)</p> <p>F - i : Identifies particularities in look or taste between workgroup samples (var) F : Casual conversation about food develops between students and nutritionists which is outside the particular topic of workshop (var) F : Congratulates students on taste of final product (var)</p>

		F : Identifying to food sample to be taken home (var)		(const)		
Misc	F : (var) Refers negatively to previous workshop functioning	F - ii: Refers negatively to individual behaviour		F-ii : Students behaviour is distracting (const)		
Sending students accomplishments home						
<b>Building Alliances with School</b>						
Connecting the nutrition workshop into the teachers timetable <i>- defined by the actions taken by the nutritionist, during and outside the nutrition workshop, in response to the pedagogic needs and personal interests of teachers.</i>	<p>E : T addresses the class with detail on cooking procedures (var)</p> <p>E : T addresses the class with detail on roles &amp; responsibilities (var)</p> <p>E : T repeats N instructions (var)</p> <p>E : T is pro-active reminding about silence, taking turns etc. (const)</p> <p>F-i : T addresses the class with detail on cooking procedures (var)</p>			<p>E : N asks class if they have done preparatory activity (var)</p> <p>E : T has prepared class by completing preparatory activity (var)</p> <p>E : T is pro-active reminding about silence, taking turns, raising hand etc. (const)</p> <p>E : N uses teachers responses, commentaries and questions in content of lesson (var)</p> <p>E : T appears to be listening (const)</p> <p>F-i : T is pro-active reminding about silence, taking turns, raising hand</p>		

	<p>F-i : T addresses the class with extra information on food (var)          F-i : T repeats N instructions (const)          F-i : T is pro-active reminding about silence, taking turns etc. (const)</p> <p>F-ii : T has prepared class by reading recipe, assigning S roles and workgroups (var)          F-ii : N often reminds students about silence, taking turns, raising hand etc.          F-ii : T is reactive with discipline when N is unsuccessful</p>			<p>etc. (const)          F-i : T appears to be listening (const)          F-i : Uses teachers responses, commentaries and questions in content of lesson (var)</p> <p>F-ii : N asks class if they have done preparatory activity (var)          F-ii : T is physically or mentally absent at times (var)          F-ii : N often reminds students about silence, taking turns, raising hand etc. (var)          F-ii : T is reactive with discipline when N is unsuccessful (var)</p>		
<p>Connecting the educational institution with nutrition education - <i>defined by the nutritionists actions</i></p>	<p>E : N asks class if they have read recipe (const)          E : T has prepared class by reading recipe (const)          E : T has</p>			<p>E : T interjects with a question about food or nutrition (var)          E : T addresses the class with personal antidote (var)          E : T supplements N lesson with extra information (var)</p>		

<p><i>to respond to the explicit needs of the school to build social competencies among students, partnerships with parents and health education into the curriculum</i></p>	<p>prepared class by assigning S roles and workgroups (var)            E : T makes adjustment to N instructions (var)            E : N incorporates collective learning; names roles and explains responsibilities (const)            E : N identifies math, vocabulary</p> <p>F-ii : N asks class if they have read recipe (var)            F-ii : N incorporates collective learning; names roles and explains responsibilities (const)</p>			<p>F-i : T interjects with a question about food or nutrition (var)            F-i : T addresses the class with personal antidote (var)            F-i : T supplements N lesson with extra information (var)</p>		
<p>Appealing to teacher's personal health and wellness interests</p>	<p>E : Teacher may be silent or very active</p>					

<p>Appealing to educational values part of the school</p>	<p>E : Rccipe with class preparation, vocabulary</p>					
<p>Appealing to health values part of the school</p>						