Using Interactive Web Training to Teach Parents to Select Function-Based Interventions for

Challenging Behaviour: A Preliminary Study

Brigitte Marleau, Marc J. Lanovaz, and Alexie Gendron

Université de Montréal

Thomas S. Higbee

Utah State University

Diane Morin

Université du Québec à Montréal

Correspondence concerning this article should be addressed to Marc J. Lanovaz, École de

Psychoéducation, Université de Montréal, C. P. 6128, succ. Centre-Ville,

Montreal, QC, Canada, H3C 3J7. Email: marc.lanovaz@umontreal.ca, tel.: 1 514 343 6111 ext.

81774

Abstract

Background: Children with developmental disability often engage in challenging behaviour, which may require that parents implement behavioural assessments and interventions. The purpose of our pilot study was to examine the effects of an interactive web training (IWT) to teach behavioural function identification and intervention selection to parents.

Method: Twenty-six parents of children with developmental disability responded to function identification and intervention selection tasks on clinical vignettes before and following IWT. We also measured social validity and the duration of training.

Results: Our results show that parents were more accurate in the identification of behavioural function and selected more adequate interventions following IWT. On average, parents spent less than 2.5hr to complete IWT and rated it positively.

Conclusions: The IWT appears to be a viable tool to teach parents about function-based intervention, but additional research is needed to examine whether it translates to changes in parental practices and child behaviour.

Keywords: behavioural intervention, challenging behaviour, developmental disability, online training, parent training

Using Interactive Web Training to Teach Parents to Select Function-Based Interventions for

Challenging Behaviour: A Preliminary Study

Children with developmental disability tend to engage in higher levels of challenging

behaviour than those without disability (e.g., Dekker, Nunn, Einfeld, Tonge, & Koot, 2002;

Lecavalier, 2006; McClintock, Hall, & Oliver, 2003). Meta-analyses have shown that

behavioural interventions have strong empirical support for addressing these issues in individuals

with developmental disability (Campbell, 2003; Harvey, Boer, Meyer, & Evans, 2009; Heyvaert,

Saenen, Campbell, Maes, & Onghena, 2014). The previous meta-analyses indicated that the most

effective behavioural interventions commonly shared two main characteristics. First, effective

behavioural interventions typically consider the hypothesised function of challenging behaviour.

Hence, individuals implementing behavioural interventions should develop a hypothesis

regarding function prior to intervening. Second, interventions that involve multiple components

seem generally more effective than ones that involve a single component. Combining multiple

behavioural interventions together (e.g., antecedent manipulation with extinction and differential

reinforcement) may thus improve effectiveness.

A third essential component is the involvement of parents in function identification and

intervention selection (Dababnah & Parish, 2016; Heitzman-Powell, Buzhardt, Rusinko, &

Miller, 2014; Shayne & Miltenberger, 2013). Learning to identify the function of challenging

behaviour and to select appropriate interventions can be a daunting task for parents. That said,

Shayne and Miltenberger (2013) showed that parents of typically developing children could

independently identify the function of challenging behaviour and select appropriate interventions

following behaviour skills training, which involved written and oral instructions, modeling,

practice and feedback. One drawback of behavioural skills training is that it typically requires

one-to-one instruction. Factors such as a limited number of specialists in one's area, geographic isolation, high costs of private services, and long waiting lists associated with public-funded services may hinder accessibility to this type of individualised training.

One promising solution is to train parents to reduce challenging behaviour using interactive web-based training (IWT), which combines the use of self-paced computer instruction (e.g., oral explanations, descriptive slides, self-guided practice, integrated quizzes) and video models (Antonsson, Graneheim, Isaksson, Åström, & Lundström, 2016; Gerencser, Higbee, Akers, & Contreras, 2017; Pollard, Higbee, Akers, & Brodhead, 2014). To this end, we recently developed an IWT designed to support parents in the reduction of challenging behaviour in children with developmental disability. Prior to testing its effects on children, however, we must first make sure that the IWT improves parental knowledge, is easy to use, and is social acceptable. Thus, the purpose of our study was to conduct a preliminary examination of (a) the effects of IWT on function identification and intervention selection by parents, (b) its duration, and (c) its social validity.

Method

Participants

We recruited parents of children with developmental disability who could speak and understand French. Parents who had formal training in psychosocial interventions (e.g., social work, behaviour analysis, special education) or who had already participated in formal training in behaviour management were ineligible to participate. To recruit parents, we posted an ad on social media asking potential participants to contact us. Then, the first author met with each parent to obtain informed consent. In total, 31 parents initially accepted to participate in the study, but only 26 parents completed the training modules. The five parents who withdrew all

cited either exhaustion or lack of time to complete the training as reasons for interrupting their participation. Table 1 presents the characteristics of the 26 participants that completed participation. Our sample included two couples; we asked each parent not to discuss the training with their partner during the study.

Measures

Function identification tasks. To examine whether parents could identify the function of challenging behaviour correctly, we developed ABC charts for analysis. On each chart, we described an antecedent, a behaviour, and a consequence for five events that had the same function (i.e., tangible, attention, escape, or nonsocial [sensory]). We created three charts for each function (i.e., twelve charts in total). Two members of the research team (including a doctoral-level behaviour analyst) validated the function of each chart prior to their analyses by parents. During testing, the parent had to identify the behavioural function for each chart. We randomly assigned six charts to pre-test and six charts to post-test for each participant.

Intervention selection tasks. For the intervention selection task, we adapted the procedures developed by Shayne and Miltenberger (2013). First, we developed a series of eight clinical vignettes describing a behaviour and its function (two vignettes per function). Then, we provided parents with response sheets with appropriate and inappropriate function-based interventions and asked them to select the three best options (see Appendix A in Shayne and Miltenberger, 2013). In addition to twelve response choices described in Shayne and Miltenberger, we added three response choices for the nonsocial (sensory) function: (a) the parent will teach the child to keep busy during free time, (b) the parent will offer a choice of toys and activities that produce forms of stimulation similar to that generated by the challenging behaviour, and (c) when the behaviour occurs, the parent will interrupt and redirect the child.

The correct responses were the same as in the Shayne and Miltenberger study, except that the

three new options applied to the nonsocial function. For each participant, we randomly assigned

one vignette for each function at pre-test and the other vignette with the same function was

completed at post-test.

Descriptive measures. The web app automatically recorded the amount of time spent

completing each module, the number of times each module was accessed, and the percentage of

correct responses on end-of-module quizzes.

Social validity. We adapted and translated the Treatment Acceptability Rating Form

Revised (TARF-R; Reimers, Wacker, & Cooper, 1991) to French (available from corresponding

author). Our new version contained 20 items scored on a 5-point Likert-type scale: 12 items

targeted the format (i.e., web-based training) and 8 items the content. As in the original TARF-R,

the questions were related to the acceptability, ease of use, and side-effects of the intervention.

Interactive Web Training (IWT)

The IWT included four modules, which were each comprised of written instructions (.pdf

file), audio recordings accompanied by a slideshow, video models, and quizzes. We also

provided a paper copy of the written instructions to minimise costs associated with participating

in the study. Modules were all in French and accessible through a password-protected website.

Each module lasted approximately 30 to 40 min and ended with a 10-question multiple-choice

quiz. The parent had to score 80% or more correct on the end-of-module quiz to have access to

the following module. If not, the parent was prompted to repeat the module that had been failed.

Module 1 defined challenging behaviour and explained the functions that may maintain

behaviour in the natural environment. Module 2 examined antecedent modifications that a parent

can make in the environment to prevent the behaviour (e.g., noncontingent access to preferred

items, demand fading). Module 3 taught the parents how to react to the behaviour by minimising access to reinforcement contingent on challenging behaviour (e.g., extinction, response interruption and redirection). Module 4 showed the parents how to teach alternative appropriate behaviour to their child (e.g., differential reinforcement).

Design and Procedures

We used a pretest-postest comparison group design to examine the effects of the IWT. First, we administered a socio-demographic questionnaire followed by the function identification and intervention selection tasks to the parents. Next, we provided a link to the website, a username and a password to the parents and asked them to complete the IWT within the next two weeks. During this time, the app recorded descriptive data on access to each module. Finally, we conducted a second visit during which we re-administered the tasks and asked the parents to complete the social validity questionnaire.

Analysis

We converted the measures of the function identification and intervention selection tasks to percentages. Given that our data were not normally distributed and prone to both baseline and ceiling effects, we compared changes from pre-test to post-test using a non parametric Wilcoxon signed rank. Next, we compiled the results collected directly by the app. For duration measures and the quiz results for each module, we only report the results for the first completion as subsequent completions were prone to practice effects. Finally, we identified the items on the social validity questionnaire that the parents rated highest and lowest.

Results

Parents significantly improved on function identification from pre-test to post-test ($W = 0$, $Z = 4.47$, $p < .0001$). Correct responding increased from 26% prior training to 92% following

training, which yielded a very large effect size ($d = 2.89$). Similarly, correct responding on intervention selection significantly improved following training ($W = 39$, $Z = 3.34$, $p < .0001$). Mean correct responding was 51% at pre-test and 74% at post-test, which yielded a large effect size ($d = 0.84$).

Table 2 presents the descriptive data collected directly by the web-based app. The first and second modules were approximately 10 min longer to complete and produced higher levels of correct responding than the third and fourth modules. On average, parents took less than 2.5 hr to complete all four modules once. On a scale of 0 to 4, the highest scored items on the social validity questionnaire indicated that the parents would recommend the training to other family members or other parents of children with developmental disability ($M = 3.85$), would be available to participate in other similar trainings in the future ($M = 3.85$), believed that the training improved their parental practices ($M = 3.85$), found the online format of training acceptable given their concerns ($M = 3.81$) and thought that IWT was an appropriate medium for teaching ($M = 3.81$). On the other hand, the parents scored lowest the items related to the time it would take to implement the recommended interventions on daily basis ($M = 1.77$), the usefulness of the written document ($M = 2.77$), the side-effects of some of the proposed interventions ($M = 2.88$), and the disruptiveness of some interventions for the family routine ($M = 2.96$).

Discussion

Overall, the preliminary results indicate that IWT led to improvements in function identification and intervention selection in parents of children with developmental disability. Furthermore, the training was generally easy to follow: the median time to complete all modules once was less than 2.5 hr and a majority of participants (i.e., 54%) successfully passed all

modules on their first trial. Finally, the parents found the format and content socially acceptable. However, parents expressed concerns regarding the side-effects of the proposed interventions, which is unsurprising given that we emphasised the temporary side-effects of extinction (i.e., increased variability, frequency, and intensity) in the training. Interestingly, our attrition rate was high (i.e., 16%) considering the low response effort associated with IWT. Researchers should thus examine strategies to increase participation of families who report exhaustion or lack of time.

Our results are consistent with prior research that have shown that IWT may be an effective strategy to teach intervention skills to individuals working or living with persons with developmental disability (Antonsson et al., 2016, Nosik, Williams, Garrido, & Lee, 2013; Eldevik et al., 2013; Gerencser et al. 2017; Pollard et al., 2014). Our study is the first to show that IWT can also be adapted to teach function identification and intervention selection to parents. Although we do not expect any major cultural differences, our study also extends the literature by conducting training in a different cultural context than previous research on IWT (i.e., French-speaking families). From a clinical standpoint, IWT may serve as a low cost and high accessibility first-tier intervention for families who cannot afford or do not have access to support services, but more research is needed beforehand to address the limitations of our study.

The main limitation is that we did not measure child behaviour, nor parental practices. As such, it is unclear whether the parents' children displayed less or more complex challenging behaviour than our target population or whether the gains in knowledge translated to actual changes in behaviour. The small sample size is also a limitation of the current study. Moreover, our use of social media to recruit participants may limit our results insofar as parents who use such sites may be more at ease with technology than those who do not. Finally, we only

considered four broad functions as part of the function identification task. Future research could examine function identification using models that consider the influence of other variables (e.g., biopsychosocial model; Griffiths & Gardner, 2002). In sum, conducting replications while examining the effects of IWT on parental practices and child behaviour will be essential to establish the generality of our preliminary findings.

Acknowledgments

References

Antonsson, H., Graneheim, U. H., Isaksson, U., Åström, S. & Lundström, M. O. (2016).

　　　Evaluation of a web-based training program for professional carers working with people

　　　with learning disabilities and challenging behavior: A pilot study with SSED-design.

　　　Issues in Mental Health Nursing, *37,* 734-743. doi: 10.1080/01612840.2016.1189636

Campbell, J. M. (2003). Efficacy of behavioral interventions for reducing problem behavior in

　　　persons with autism: a quantitative synthesis of single-subject research. *Research in*

　　　Developmental Disabilities, *24*, 120-138. doi: 10.1016/S0891-4222(03)00014-3

Dababnah, S., & Parish, S. L. (2016). Feasibility of an empirically based program for parents of

　　　preschoolers with autism spectrum disorder. *Autism, 20*, 85-95. doi:

　　　10.1177/1362361314568900

Dekker, M. C., Nunn, R. J., Einfeld, S. E., Tonge, B. J., & Koot, H. M. (2002). Assessing

　　　emotional and behavioral problems in children with intellectual disability: Revisiting the

　　　factor structure of the developmental behavior checklist. *Journal of Autism and*

　　　Developmental Disorders, 32, 601-610. doi: 10.1023/A:1021263216093

Eldevik, S., Ondire, I., Hughes, J. C., Grindle, C. F., Randell, T., & Remington, B. (2013).

　　　Effects of computer simulation training on in vivo discrete trial teaching. *Journal of*

　　　Autism and Developmental Disorders, 43, 569-578. doi:10.1007/s10803-012-1593-x

Gerencser, K. R., Higbee, T. S., Akers, J. S., & Contreras, B. P. (2017). Evaluation of interactive

　　　computerized training to teach parents to implement photographic activity schedules with

　　　children with autism spectrum disorder. *Journal of Applied Behavior Analysis*. Advanced

　　　online publication. doi: 10.1002/jaba.386

Griffiths D. M, & Gardner W. I. (2002). The integrated biopsychosocial approach to challenging

behaviors. In D. M. Griffiths, C. Stavrakaki & J. Summers (Eds.), *Dual diagnosis: An*

introduction to the mental health needs of persons with developmental disabilities (pp.

81-114). Sudbury, Ontario: Habilitative Mental Health Resource Network.

Harvey, S. T., Boer, D., Meyer, L. H., & Evans, I. M. (2009). Updating a meta-analysis of

intervention research with challenging behavior: Treatment validity and standards of

practice. *Journal of Intellectual and Developmental Disability, 34,* 67-80. doi:

10.1080/13668250802690922

Heyvaert, M., Saenen, L., Campbell, J. M., Maes, B., & Onghena, P. (2014). Efficacy of

behavioral interventions for reducing problem behavior in persons with autism: An

updated quantitative synthesis of single-subject research. *Research in Developmental*

Disabilities, *35*, 2463-2476. doi: 10.1016/j.ridd.2014.06.017

Heitzman-Powell, L. S., Buzhardt, J., Rusinko, L. C., & Miller, T. M. (2014). Formative

evaluation of an ABA outreach training program for parents of children with autism in

remote areas. *Focus on Autism and Other Developmental Disabilities, 29*, 23-38.

doi:10.1177/1088357613504992

Lecavalier, L. (2006). Behavioral and emotional problems in young people with pervasive

developmental disorders: Relative prevalence, effects of subject characteristics, and

empirical classification. *Journal of Autism and Developmental disorders*, *36*, 1101-1114.

doi: 10.1007/s10803-006-0147-5

McClintock, K., Hall, S., & Oliver, C. (2003). Risk markers associated with challenging

behaviours in people with intellectual disabilities: A meta-analytic study. *Journal of*

Intellectual Disability Research, *47*, 405-416. doi: 10.1046/j.1365-2788.2003.00517.x

Nosik, M. R., Williams, W. L., Garrido, N., & Lee, S. (2013). Comparison of computer based

      instruction to behavior skills training for teaching staff implementation of discrete-trial

      instruction with an adult with autism. *Research in Developmental Disabilities, 34*, 461-

      468. doi: 10.1016/j.ridd.2012.08.01

Pollard, J. S., Higbee, T. S., Akers, J. S., & Brodhead, M. T. (2014). An evaluation of interactive

      computer training to teach instructors to implement discrete trials with children with

      autism. *Journal of Applied Behavior Analysis, 47*, 765-776. doi: 10.1002/jaba.152

Reimers, T. M., Wacker, D. P., & Cooper, L. J. (1991). Evaluation of the acceptability of

      treatments for their children's behavioral difficulties: Ratings by parents receiving

      services in an outpatient clinic. *Child & Family Behavior Therapy, 13*, 53–71. doi:

      10.1300/J019v13n02_04

Shayne, R. K., & Miltenberger, R. G. (2013). Evaluation of behavioral skills training for

      teaching functional assessment and treatment selection skills to parents. *Behavioral

      Interventions, 28*, 4-21. doi:10.1002/bin.1350

Table 1

Characteristics of the Participating Parents

Variables	Frequency	Percentage
Gender		
Female	23	88.5
Male	3	11.5
Language spoken at home		
French	22	84.6
English	1	3.8
Other	3	11.5
Education		
High school	5	19.2
Some college	7	26.9
Undergraduate degree	12	46.2
Graduate degree	2	7.7
Household income (in [remove for blind review])		
Less than $10,000/year	1	3.8
$10,000-$29,999/year	5	19.2
$30,000-$49,999/year	4	15.4
$50,000-$69,999/year	3	11.5
$70,000-$89,000/year	4	15.4
$90,000 or more	9	34.6
Child diagnostic		
ASD	23	88.5
ID	3	11.5

Notes. ASD = autism spectrum disorders, ID = intellectual disability

Table 2

Median Duration, End-of-Module Scores, and Number of Times Accessed for Each Module

| Module | Median duration (min) | End-of-module quiz (%) | Number of times accessed | |
			Median	Maximum
1	39	91	1	10
2	39	91	1	3
3	28	82	1	5
4	29	84	1	4