Université de Montréal

Written Consent and Reproductive Autonomy in the Context of Prenatal Screening

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Ce mémoire intitulé

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Résumé

Le test prénatal non invasif (TPNI) est une technique de dépistage prénatal qui ne présente pas de risque accru de fausse couche, peut être effectué plus tôt dans la grossesse et est plus précis que les technologies existantes. Cependant, ces avantages peuvent contribuer à l'érosion de l'autonomie reproductive. Entre 2013 et 2017, une étude intitulée PEGASE a été menée, validant les performances et l'utilité du TPNI, ainsi qu'analysant les implications économiques, éthiques, juridiques et sociales de la technologie. Le présent mémoire est basé sur les données d'une enquête auprès des professionnels de santé (N = 184).

Ce mémoire aborde la relation entre les attitudes des professionnels de santé concernant a) le "consentement éclairé" et b) le "consentement écrit" dans le contexte du TPNI. Il remet en question le récit établi dans la littérature, que les professionnels qui croient que le consentement écrit pour le TPNI n'est pas important croient également que les procédures de consentement pour le TPNI «devraient devenir moins rigoureuses» (1).

Les données montrent que ce sont les professionnels qui se soucient de l'autonomie qui doutent de l'importance du consentement écrit. Cela contredit le récit cité ci-dessus. Les opinions des professionnels sur le «consentement écrit» ne peuvent donc pas être utilisées pour inférer leurs opinions sur l'importance du «consentement éclairé». Il est recommandé d'enquêter les professionnels de la santé sur des considérations particulières liées à la pratique, telles que celles enquêtées dans cette étude, plutôt que d'interroger les répondants sur des concepts académiques tels le «consentement» ou l'«autonomie».

Mots clés : autonomie, consentement informé, consentement écrit, dépistage prénatal, TPNI

Abstract

Non-Invasive Prenatal Testing (NIPT) is a new generation of prenatal screening that poses no increased risk of miscarriage, can be performed earlier in the pregnancy, and is more accurate than previously existing technologies. These advantages, however, potentially contribute to eroding reproductive autonomy, already under threat from other screening methods. Between 2013 and 2017, a study titled PEGASUS was conducted, validating the performance and utility of NIPT, as well as studying the economic, ethical, legal and social implications of the technology. One of these activities was a series of surveys conducted throughout Canada in 2015-16. The present thesis is based on the data from the healthcare professionals' survey (N=184).

This thesis addresses the relationship between healthcare professionals' beliefs regarding a) "informed consent" and b) "written consent" in the context of NIPT. It questions the established narrative in the bioethics literature, that professionals who believe written consent for NIPT is not important also believe consent procedures for NIPT "should become less rigorous" than those used for invasive prenatal testing (1).

Data from the survey shows that it is precisely those professionals who care about reproductive autonomy considerations who doubt the importance of written consent for NIPT. This directly contradicts the narrative cited above. Professionals' stated views on "written consent" thus cannot be used to infer their unstated views on the importance of "informed consent". It is recommended to investigate particular practice-based considerations such as the ones in this study rather than querying survey respondents on scholarly concepts such as "consent" or "autonomy".

Keywords: autonomy, consent, informed consent, written consent, prenatal screening, NIPT

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Roadmap

Chapter One sets the background for posing the research question by going over the basics of prenatal screening, in general, and non-invasive prenatal testing, in particular, and the challenges these present to patient autonomy.

Chapter Two explains the bioethics literature that lead to the formulation of the research question of this thesis:

> Is it possible to justify, given the Canadian data I have access to, the view that healthcare professionals' stated disregard for written consent in the context of NIPT can be taken as indication of their belief that "consent procedures […] should become less rigorous" (Deans and Newson 2011)?

Chapter Three discusses the study's theoretical frame, laying out the concepts of consent and autonomy as they are used herein, including the possible interpretations of why, given the inadequacy of written consent to indicate informed consent, and the body of literature criticizing written consent, it is that we sometimes fall into the trap of conflating the two. This brief section makes use of anthropological and historical analyses of what written consent symbolizes and how it has come to be reformulated "from a matter of liability to a means of patient protection by way of guaranteeing 'autonomy' to individual patients" (2).

Chapter Four presents the study methodology and results.

Chapter Five, the discussion, opens by going over research participants' stated reasons for believing written consent to be important or not in the context of NIPT. These remind us that there is no monolithic "Canadian healthcare provider viewpoint", and that although many respondents confuse written and informed consent in their responses, many others differentiate between the two. We likewise see evidence that 1) some healthcare professionals' requirements for informed consent are eroding, as well as 2) other healthcare professionals are calling for more rigorous measures for respecting informed consent. The discussion then turns to interpreting the results of the quantitative portion of the study, which suggest that healthcare professionals who claim that "written consent is not important for NIPT" are more likely to be those who demonstrate respect

for certain aspects of patients' autonomy, clearly contradicting the narratives that conflate written and informed consent.

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Although I ought to thank everyone I have ever known and read (how can one ever be sure where one's ideas come from?), I will attempt to highlight those who have directly contributed to my understanding of the issues treated in this thesis.

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List of Abbreviations and Acronyms

AB: Alberta
ACMG: American College of Medical Genetics and Genomics
BC: British Columbia
CCMG: Canadian College of Medical Geneticists
cfDNA: circulating free deoxyribonucleic acid
CHU: Centre hospitalier de l'université … (french for University Health Centre)
CRCHU: Centre de Recherche du CHU … (french for CHU Research Centre)
DS: Down syndrome
FTS: First Trimester Combined Screening
HCP: Healthcare professional/practitioner
HIV: Human immunodeficiency virus
IPS: Integrated prenatal screening
IRB: Institutional Review Board
ISPD: International Society for Prenatal Diagnosis
MB: Manitoba
MSS: Maternal serum screening
NIH: National Institutes of Health
NIPD: Non-invasive prenatal diagnosis
NIPS: Non-invasive prenatal screening
NIPT: Non-invasive prenatal testing
ON: Ontario
PEGASUS: PErsonalized Genomics for prenatal Aneuploidy Screening USing maternal blood
Pt: Patient
QC: Québec
SD: Standard deviation
SOGC: Society of Obstetricians and Gynecologists of Canada
SDT: Self-Determination Theory
TCPS2: Tri-Council Policy Statement 2
U: University

CHAPTER ONE: BACKGROUND

PRENATAL SCREENING

Prenatal screening refers to any technology that identifies pregnancies with a high probability of being affected with conditions such as chromosomal abnormalities (e.g. Down Syndrome (DS)) and neural tube defects. Prenatal screening differs from prenatal diagnosis (e.g. amniocentesis) in that screening only yields probabilistic results such as 1:100 or 1:10 000, and thus never completely rules out the possibility of the disease or condition being present. Diagnostic tests do provide a definitive positive or negative result. A diagnostic procedure is thus needed to confirm screening results before deciding on a further course of action (e.g., preparation for a child with possible special needs, prenatal intervention, or pregnancy termination) (3). Prenatal diagnostic techniques such as amniocentesis are not without risk, resulting in miscarriage in 0.5% of cases on average.

Of the approximate 450 000 pregnancies annually in Canada, approximately 10 000 undergo amniocentesis, of which 315 are found to have a baby with DS and with 70 unaffected pregnancies lost from complications of the procedure (4).

Longstanding Issues Raised by Prenatal Screening

At its inception in the 60's and 70's, prenatal testing was presented as a means of preventing disease and "mental retardation" (5). It is only in the 90's that the concept of reproductive autonomy became dominant in the discourse concerning prenatal screening. Following criticism from feminist and disability rights activists, the various professional bodies involved in providing prenatal screening services distanced themselves from accusations of eugenic practices by framing prenatal screening as a matter of personal choice regarding one's life as opposed to a matter of public health (3, 5).

Since then, autonomy and choice have been heralded as the main goals of prenatal screening (6), fitting into 'free-market' narratives that medical innovations are adopted as a result of sufficient demand by free and rational homo oeconomicus (7). This would mean that women of child-bearing age must have demonstrated sufficient interest for market forces to drive the development of relevant tests. However, in the case of prenatal screening, this scenario has been

questioned: “programs were initiated by government organizations, interested sectors of the medical profession, and the medical supply industry for their own purposes” (6, 8). This strengthens the argument that autonomy might be used as a fig leaf hiding different interests (3, 9).

Paradoxically, while being touted as enhancing choice, prenatal screening has, from its infancy, been criticized for undermining parents’ autonomy (10). Press and Browner claimed that when screening programs were first introduced by the government (in their case, in California), stakeholders had no interest in promoting reproductive autonomy via processes of informed consent. Stakeholders included the attending healthcare professionals who feared that if women reject screening they may face malpractice liability for “later claims of inadequate test explanation,” policy-makers whose interests were in increasing screening for economic and public health reasons, and expecting women who wanted access to available services but preferred to not engage in complicated deliberations that would involve the possibility of pregnancy termination. It is therefore important to contextualize the concept of “choice” that allegedly underlies prenatal screening within the broader social context, in order to effectively frame these choices (or lack thereof). Prenatal screening has thus been criticized for raising a slew of issues that ultimately inhibit reproductive autonomy, precisely the opposite of what it was lauded for (3).

NIPT

Non-invasive prenatal testing (NIPT) is a technology first introduced into clinical practice in 2011 (11). The technology is based on the discovery that cell-free fetal DNA originating from the placenta and circulating in maternal blood can be tested to detect genetic conditions in the fetus as early as the 9th week of pregnancy. NIPT holds no risk of miscarriage and offers clinical benefits over existing prenatal screening tests such as maternal serum screening (MSS) by detecting the presence of trisomy 21 with high sensitivity and specificity (99.9% and 98% respectively) (12-14).

By offering relatively easy and early detection of abnormalities, without risk to the fetus, NIPT provides important benefits for pregnant women and their families when compared to conventional screening and amniocentesis. The fact that results can be available earlier provides parents with more time to make decisions about the course of action and outcome of the pregnancy. Likewise,

NIPT's improved accuracy reduces the number of false-positive and false-negative results thereby diminishing the drawbacks associated with traditional modes of screening. False-negative results can generate a false sense of reassurance, while false-positive results can provoke unnecessary anxiety and stress. NIPT also reduces the need for invasive procedures since it has higher detection rates and lower false-positive rates compared to any previous prenatal screening tests. NIPT thus has the benefit of reducing the number of fetal losses associated with invasive tests. When it comes to a positive NIPT result, all professional societies currently recommend confirming the result with invasive diagnostic testing prior to making any decision regarding termination (15).

The benefits NIPT may offer pregnant women are significant, and therefore, not offering or covering it may constitute an infringement on reproductive autonomy, just as limiting access to any reproductive technology may constitute an affront to reproductive autonomy. However, it is precisely these purported benefits of NIPT that ethicists warn may lead to an exacerbation of the ethical issues intrinsic to prenatal testing, particularly those related to reproductive autonomy.

CHALLENGES NIPT POSES TO AUTONOMY

The timing, reliability and safe nature of NIPT exacerbate concerns regarding the pressure placed on parents to screen and possibly terminate due to positive diagnostic results.

First, NIPT can provide results earlier in the pregnancy than previous screening tests. This provides a crucial benefit to pregnant women and their families, as it allows earlier diagnostic testing and – in case of a positive diagnostic result – either more time to prepare for possible early therapeutic interventions or just to prepare for the birth of a child with special needs, or an earlier pregnancy termination. At the same time, the timing, reliability and safe nature of NIPT exacerbate concerns regarding the pressure placed on parents to screen and possibly terminate due to positive diagnostic results (3). Prior to the introduction of NIPT, parents could decline screening under the 'pretext' of poor performance of conventional screens, the risk of miscarriage associated with invasive diagnostic testing and the fact that results are only available at an advanced stage of the pregnancy (approaching 20 weeks) even if they actually had other reasons for not screening (16). Such reasons could include a preference for a less medicalized pregnancy or an acceptance of the

possibility of having a disabled child, reasons which they might fear care providers, family members or society would not approve of (17).

Second, the non-invasive (i.e. safe for the fetus) nature of NIPT, may lead to further undermining of informed consent and reproductive autonomy. Empirical studies have shown that some healthcare professionals believe NIPT warrants less formal informed consent procedures because it presents no increased risk of miscarriage (3, 18, 19). In addition, the common practice of same day pre-test counselling, directly followed by NIPT, further erodes informed consent because it eliminates the reflection period during which patients can discuss and decide whether to undergo screening (20).

Third, the increased accuracy of NIPT results, as compared with previous screening techniques, changes the nature of the information the test yields. Whereas previous technologies provided a probability that the pregnancy is at high risk, NIPT now yields results (at least for trisomy 21) that may be perceived by parents as quasi-diagnostic. If consent is lacking or not fully informed, parents may receive results that they are unprepared for, or even do not wish to know(3). It may be argued that disclosure of an unwanted result from NIPT that is more reliable violates parents' reproductive autonomy more extensively than the disclosure of more uncertain risk information (9).

Prenatal screening is seen by many women as part of routine prenatal care (21, 22). Although NIPT has been rapidly implemented into publicly-funded screening pathways in some countries (e.g. the Netherlands, Belgium) (23-25), in most countries it is still offered only privately (11, 26) and is not yet considered standard of care, despite strong commercial interests that strive to make it a routine part of prenatal care (27, 28). NIPT offers great benefits and is thus a laudable, as well as ethically acceptable, step forward when it comes to enhancing women's access to information they desire. At the same time, issues inherent in prenatal screening concerning reproductive autonomy have not yet been resolved and can now be exacerbated by NIPT(3).

On the other hand, some may view the disclosure of more reliable results, even without appropriate consent, as less damaging than the disclosure of risk information. This is because risk information can create much anxiety for no reason (since with previous screening technologies most cases ended up being false positives), whereas NIPT results provide more certainty and significantly reduce the number of individuals unnecessarily exposed to anxiety and stress. This is

the rationale behind the recently proposed mechanism of 'reflex testing' (29), in which two blood samples are taken when women go through conventional serum screening. If a woman's first-tier screen comes back as high-risk, her second blood sample is automatically sent for NIPT, and the woman is only informed of the NIPT result, without ever having been exposed to the less reliable result of the first-tier screen. The researchers who proposed this model argue that this eliminates the unnecessary anxiety suffered by all those for whom first-tier serum screening produces false-positive high-risk results. However, there is no assurance of women being properly counseled and understanding the testing pathway they have unknowingly embarked upon. Thus, the advantage of reduced anxiety is achieved at the expense of informed consent and the woman's right to choose (3, 30-32).

In addition to feeling undue pressure when presented with the allegedly free choice of whether to screen, diagnose, and terminate, infringements on reproductive autonomy can occur when women do not sufficiently understand the implications of the test (3). Research has revealed that a significant number of women undergo screening without being aware that they were being tested (33, 34). Even if they are made aware that they are being screened and agree to it, many women report having received inadequate information about the conditions screened for, and what these conditions imply on a day-to-day basis, or having been led to believe that screening was mandatory or medically required (35-38). Such practices reflect the lack of time allowed for counseling: "As almost all results will be reassuring, professionals may also find it less important to inform women about the choices they may be faced with down the line of a further screening trajectory" (39).

Disability rights scholars and activists claim that many people make prenatal screening decisions based on misconceptions about disability (27), therefore making uninformed choices, and that these misconceptions may be reinforced by health professionals who share them (40).

Even if all relevant information regarding screening is made available and precautions to avoid any undue pressure are taken, the question regarding whether more information necessarily translates into greater autonomy remains. Evidence shows that prospective parents may experience bewilderment at the amount of information provided by prenatal screening (41). Information overload can be a cause of anxiety and stress and prospective parents may be left feeling perplexed when faced with the subsequent decisions they must make (3). It is important to note that this "burden of choice imposed on women" (20) is difficult because of the sensitive nature of the

information presented. This type of information can unnecessarily increase anxiety for the prospective parents (42), negatively affect the pregnancy experience and present parents with difficult reproductive choices – choices that they might not have had to face if they had forgone prenatal screening (39, 43).

Additionally, this "bewilderment" applies not only to results provided *by* prenatal screening but also to information provided *about* prenatal screening at various stages of the process(3). Hence, while Press and Browner (10) pointed out that prospective parents prefer not to dwell on the social and ethical dimensions of prenatal screening, Kukla (44) suggested that parents often make a conscious choice to defer decisions to healthcare practitioners as a way of avoiding the burdens of information overload and decision-making regarding screening.

While respecting autonomy necessarily requires doing so throughout the process of prenatal screening, the social contexts outlined above create barriers to achieving this goal (9). Seavilleklein (6) concluded in 2009 that "there is incontrovertible evidence that women are not making free informed choices about prenatal screening", that "whether choice is interpreted narrowly as informed consent or broadly as relational, there are reasons to worry that women's autonomy is not being protected or promoted by the routine offer of screening" and that "incorporating the offer of prenatal screening into routine prenatal care for all pregnant women is not supported by the value of autonomy and ought to be reconsidered." These conclusions regarding prenatal screening were reached before the advent of NIPT. Ultimately, the introduction of any new prenatal screening technology into mainstream practice would require an attentive assessment of whether its implementation would contribute to or conversely undermine reproductive autonomy (3).

Societal pressure to screen, to diagnose or to terminate a pregnancy in case of positive results negatively affect the possibility of exercising reproductive autonomy. These are three separate, but interconnected, pressures. It is argued that, given the nature of our "performance society" (45), prenatal screening for conditions perceived as disabilities is framed as the responsible choice. As such, pregnant women often feel obligated to screen for these conditions and accede to the "collective silence" that positive results should eventually lead to pregnancy termination (46). Many people, when faced with the decision of whether to pursue prenatal screening, may believe that it would be irresponsible to decline participation in a publicly funded program seemingly designed for the benefit of society as a whole. After all, the implementation of such tests by the

medical system "establishes screening as a legitimate use of scarce medical resources and thereby surreptitiously underlin[es] its importance" (3, 6).

Pressures from the medical community also exacerbate the onus felt by parents to screen prenatally. There is evidence that medicine and preventive care are playing an increasing role in influencing decisions related to personal and social life. Great importance is placed on early detection and prevention of diseases and conditions, which has resulted in societal beliefs that people should participate in prevention programs and can be "morally blamed" if they fail to do so (47). Pregnancy, essentially a personal life event, has been affected by this social emphasis on disease prevention and is often perceived as requiring medical intervention and preventive care (3).

Furthermore, clinicians are often criticized for being too directive when counselling patients regarding prenatal screening options (46). Logistical constraints, fears of malpractice and negligence litigation as well as clinicians' own perceptions of the value of screening are all factors that can lead to clinicians – consciously or unconsciously – placing undue pressure on women to undergo prenatal screening. Likewise, when discussing possible future results of screening, high-risk results are often framed in ways that do not allow much space for deciding not to continue on the testing pathway. When results become available, problems in communicating them clearly, transparently, meaningfully, and in a non-directive manner have been documented, with practitioners more often recommending screening, diagnosis and pregnancy termination (3, 41, 48, 49).

Lippman noted as early as 1986 that "implicit in the model is the acceptance […] that women whose fetuses are found to be affected will abort the pregnancy, since for most of the conditions for which screening can be done there is, at present, no treatment" in utero (50). Indeed, until today, the vast majority of pregnancies found to be affected with Down syndrome are terminated (51). The lack of social support for those raising children with special needs is thought to contribute to this sense of limited choice: "without extensive social support systems, termination may be the only viable reproductive option even when women or families may be willing or may desire to raise a child with special needs" (3, 26).

Intimately related to the pressure to terminate are the so-called eugenics concerns, or what is often referred to as the "disability critique" of prenatal screening. The disability critique claims

that not only does the elimination of persons with certain conditions lead to further stigmatization of the condition, but that such practices may affect individuals already living with the condition. As such, if there is a decrease in the birth rate of individuals with a particular condition, the number of public resources and support services may also decrease (27). In attempting to enhance reproductive autonomy, it is important not to decrease the choices available to those who may want to pursue a pregnancy diagnosed with a disability or condition (3).

Guidelines

In 2013, the Genetics Committee of the Society of Obstetricians and Gynecologists of Canada (SOGC) recommended the test be an available option for pregnant women who have been identified as being at increased risk of fetal aneuploidies – through for example the results of MSS - of having an affected pregnancy (52). In 2014, the International Society for Prenatal Diagnosis (ISPD) considered the offer of NIPT as a first-tier screening test for all pregnant women to be an "appropriate" option (53). Of particular relevance to the present research:

- "All pregnant women in Canada, regardless of age, should be offered, through an informed counselling process, the option of a prenatal screening test for the most common fetal aneuploidies (II-A)." (15)
- "A discussion of the risks, benefits, and alternatives of the various prenatal diagnoses and screening options, including the option of no testing, should be undertaken with all patients prior to any prenatal screening. Women should have further discussion regarding local and provincial options available to them for prenatal genetic screening. Following this, they should be offered:

  (1) no aneuploidy screening,

  (2) standard prenatal screening based on locally offered paradigms,

  (3) ultrasound guided-invasive testing, or

  (4) maternal plasma cfDNA screening where available, with the understanding that it may not be provincially funded." (15)

CHAPTER TWO: RESEARCH QUESTION

THE PROBLEM

A study titled *Will the introduction of non-invasive prenatal testing erode informed choices? An experimental study of health care professionals* was published in 2010 in the journal *Patient Education and Counseling* (54). It reports the findings of a questionnaire administered to 231 UK health professionals "currently involved in the provision of prenatal testing". The participants were presented with one of three vignettes where they "imagine working in an antenatal clinic at a point in time when all pregnant women are routinely offered prenatal testing for DS", each of three vignettes referring to either: 1) invasive (and thus risky) prenatal diagnosis, 2) non-invasive prenatal screening using a blood draw (akin to NIPT), and 3) non-invasive diagnostic blood test (what the authors call NIPD – non-invasive prenatal diagnosis). The participants are asked "Do you think it is important for women undergoing this test to sign a consent form?", with 4 choices of responses: from 1, *definitely yes* to 4, *definitely not*. No other question regarding written consent or informed consent is reported. Depending on which of the three types of test was described in the vignette, the way respondents answered the question on the importance of signing a consent form differed, with professionals believing signing a consent form to be less important for non-invasive testing than for invasive testing. No attempt to link this result to what effect the non-invasiveness of prenatal testing could have on informed consent is made in the paper; however, the title surprisingly includes "informed choices" rather than "written consent" or "signing a consent form".

This paper turned out to be highly influential in the field, being cited 110 times, according to google scholar. And, indeed, if we look at how the findings are interpreted in articles that cite this 2010 study, the conflation of these two very different concepts of "written" and "informed consent" continues. In their 2010 article *Non-invasive prenatal testing: ethical issues explored* (55) (cited 145 times according to google scholar), de Jong et al. cite van den Heuvel et al. (54) as finding "that health care professionals seem inclined to the view that a less stringent standard of informed consent would suffice for NIPD testing". In the 2011 *Noninvasive prenatal diagnosis: pregnant women's interest and expected uptake* (37) (cited 127 times according to google scholar), Tischler et al. cite van den Heuvel et al. as evidence that "[b]ecause of the noninvasive nature and the lack of miscarriage risk, obstetricians may be less likely to approach the consent process as

rigorously for NIPD as they currently do for invasive diagnostic testing". Others, such as Allyse et al.'s 2015 *Non-invasive prenatal testing: a review of international implementation and challenges* (11) (cited 147 times according to google scholar), do not conflate the two concepts, citing van den Heuvel et al. (54) as evidence that physicians "feel there is less need to obtain written consent for NIPT than for invasive testing", which van den Heuvel's study did, indeed, find. An article by 2 of the co-authors of the original 2010 paper demonstrates that the confusion between informed consent and signing a consent form was not limited to the catchy title or other authors' overinterpretation of the findings, as Deans' and Newson's 2011 *Should Non-Invasiveness Change Informed Consent Procedures for Prenatal Diagnosis* (1) abstract begins with "[e]mpirical evidence suggests that some health professionals believe consent procedures for the emerging technology of non-invasive prenatal diagnosis should become less rigorous than those currently used for invasive prenatal testing". Believing that consent procedures "should become less rigorous" is a stretch from the original paper's "practitioners will view the consent process for prenatal diagnostic testing differently".

While it may sometimes be obvious that informed consent is not reducible to signing a consent form, the narrative reducing it exactly in this way has been put forward and propagated significantly in very influential literature. While it is plausible that practitioners may, indeed, care less about informed consent for procedures that are not risky, that is not the only possible explanation. Another one, which is quite opposite, could be that due to the complexity of interpreting genetic test information, practitioners may increasingly believe that signing a consent form is *not a sufficiently adequate manner* of ensuring informed consent.

The present research sets up a series of statistical hypothesis tests looking for evidence of practitioners who state in surveys that written consent is not important for NIPT being the same practitioners who believe informed consent should be less rigorous for NIPT. There are four possible outcomes of this survey:

1. No correlations are found whatsoever (no null hypotheses are rejected), meaning we can assert nothing regarding the relation between what practitioners believe regarding informed consent and regarding signing consent forms;
2. Evidence for the narrative suggested by van den Heuvel et al. (54) is found;
3. Evidence refuting the narrative suggested by van den Heuvel et al. (54) is found;

4. Evidence both for and against the narrative suggested by van den Heuvel et al. (54) is found.

HYPOTHESES

Group A

Hypothesis 1 – Voluntariness

It is possible for a patient to request to undergo NIPT. All else being equal, especially ensuring that the patient has access to the relevant information regarding the test, respect for such a request would constitute respect for the importance of a patient's consent. Therefore, the relationship between claiming to be motivated by respecting one's patient's wishes to undergo screening and the rejection of the importance of written consent for NIPT is to be tested.

$H_{1.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the patient asking for the test.

$H_{1.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to offer NIPT to a specific patient by the patient asking for the test.

Hypothesis 2 – Right not to know

It is also possible for a patient not to want to know whether the fetus they carry has DS. A practitioner caring about informed consent would not offer NIPT to such a patient, regardless of whether they signed a consent form or not.

$H_{2.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by the patient not wanting to know whether the fetus has DS.

$H_{2.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to NOT offer NIPT to a specific patient by the patient not wanting to know whether the fetus has DS.

Hypothesis 3 – Early results

As stated above, NIPT provides results earlier than other forms of screening. While having more time for making a decision does not obviously make the said decision more informed, it can be argued that those who would prefer to terminate a pregnancy with a fetus with DS could feel freer to do so if they found out about the DS earlier on in the pregnancy. Therefore, while having results earlier may not necessarily make the decision regarding testing more informed it does provide for more options regarding future pregnancy management.

$H_{3.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the fact that "NIPT would allow my patient to find out early in the pregnancy whether the fetus has DS or not".

$H_{3.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to offer NIPT to a specific patient by the fact that "NIPT would allow my patient to find out early in the pregnancy whether the fetus has DS or not".

Hypothesis 4 – Evidence-base

Whether or not a practitioner believes there is sufficient clinical data on NIPT has direct bearing on how informed the consent they can obtain from their patient can be.

$H_{4.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by insufficient clinical data on NIPT.

$H_{4.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to NOT offer NIPT to a specific patient by insufficient clinical data on NIPT.

Hypotheses 5,6 – Economic considerations

It is less obvious to see whether a patient being able to financially afford the test has bearing on whether they can meaningfully consent to it. Nevertheless, it was decided to include this series of hypotheses, based on 2 separate questions in the survey, among other things to test the consistency of survey responses, since this was the only issue queried twice, stated positively or negatively.

$H_{5.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by the patient being unable to pay for the test.

$H_{5.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to NOT offer NIPT to a specific patient by the patient being unable to pay for the test.

$H_{6.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the cost of the test being covered.

$H_{6.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to offer NIPT to a specific patient by the cost of the test being covered.

Group B: Societal Concerns

Hypothesis 7 – Pressure to test

It has been hypothesized that a routinization of offering NIPT can lead to women feeling pressure to undergo the test, whether they would otherwise want to or not. We queried practitioners as to their level of concern regarding routinization leading to such pressure to test.

$H_{7.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "increased pressure on women to use NIPT" "if NIPT were covered as part of routine prenatal care".

$H_{7.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with level of concern over "increased pressure on women to use NIPT" "if NIPT were covered as part of routine prenatal care".

Hypothesis 8 – Pressure to terminate

Similarly, it has been hypothesized that a routinization of NIPT can lead to more pressure felt by women to terminate a pregnancy with a fetus testing positively for DS.

$H_{8.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "increased use of NIPT leading to increased pressure to terminate if the baby has DS" "if NIPT were covered as part of routine prenatal care".

$H_{8.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with level of concern over "increased use of NIPT leading to increased pressure to terminate if the baby has DS" "if NIPT were covered as part of routine prenatal care".

Hypothesis 9 – Societal inclusivity

If a person believes that most other people use NIPT and terminate pregnancies of fetuses with DS, it is logical for this person to believe that the society into which they plan to bring a child is not accepting of children with disabilities. Such a belief could influence a person not to carry a pregnancy with a fetus with DS to term, even if they would have liked to do so had society been more inclusive.

$H_{9.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "increased availability of NIPT making people less willing to accept children with disabilities" "if NIPT were covered as part of routine prenatal care".

$H_{9.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with level of concern over "increased availability of NIPT making people less willing to accept children with disabilities" "if NIPT were covered as part of routine prenatal care".

Hypothesis 10 – Societal support

Similarly to 9, if a person believes that most other people use NIPT and terminate pregnancies of fetuses with DS, it is logical for this person to believe that any resources currently earmarked for people with DS or their families could be dismantled. Such a belief could influence a person not to have a child with DS, unless they were certain that they had the resources to raise such a child without support from social institutions.

$H_{10.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "reduction in resources available for people with DS and their families" "if NIPT were covered as part of routine prenatal care".

$H_{10.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with level of concern over "reduction in resources available for people with DS and their families" "if NIPT were covered as part of routine prenatal care".

Hypothesis 11 – Discrimination

Believing that society is increasingly discriminative of people with DS would inhibit a truly free choice regarding having a child with DS.

$H_{11.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "negative impact on individuals with DS and their families (stigma, discrimination)" "if NIPT were covered as part of routine prenatal care".

$H_{11.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with level of concern over "negative impact on individuals with DS and their families (stigma, discrimination)" "if NIPT were covered as part of routine prenatal care".

Note on group B of hypotheses:

Practitioners' concern over the above five societal issues related to the routinization of NIPT is relevant to how they perceive the importance of informed consent, because being concerned with any of these societal issues (that affect the conditions under which patients are making their reproductive decisions) is indicative of practitioners' awareness of the multifaceted nature of informed consent, beyond the mere signing of consent forms.

Group C – *Seeking alternative interpretations*

While it is possible that survey respondents who care about informed consent are less likely to perceive written consent as important, it is also possible that those who do perceive written consent

as important would be more likely to seek written consent for legal protection. As there were no questions in the survey directly related to legal liability, two other questions were chosen as proxies. The first had to do with professional recommendations and the second with the practitioner's lack of comfort explaining the test.

The reasoning was that if a practitioner claimed to be influenced by professional recommendations as to whether to offer the test, they may not be sufficiently informed on the technology and could be unreflexively following guidelines. If they were, themselves, not sufficiently informed, they could hardly provide the information necessary for the patient's consent to be informed. Before such an interpretation is criticized for its naivety, I admit it myself. I am simply documenting my own (past and mistaken) reasoning for setting up the tests as they were. Nevertheless, I am glad to have had such mistaken and naïve reasoning, because it led me to set up this hypothesis (13), which adds important nuance to the research findings.

Similarly, I believed that a practitioner who claimed not to be comfortable explaining the test would not (and could not) ensure informed consent, but would rather be interested in having a signed consent form in order to avoid legal liability.

Hypothesis 12 – Deference to professional recommendations

$H_{12.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the test being recommended by professional organizations (SOGC, CCMG, ACMG).

$H_{12.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to offer NIPT to a specific patient by the test being recommended by professional organizations (SOGC, CCMG, ACMG).

Hypothesis 13 – Practitioner's discomfort

$H_{13.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by being uncomfortable explaining the test.

$H_{13.A}$: Believing "it is important to get written consent for NIPT" DOES correlate with being influenced to NOT offer NIPT to a specific patient by being uncomfortable explaining the test.

CHAPTER THREE: THEORETICAL FRAME

CONSENT: INFORMED ET AL.

There are two non-identical concepts used in the present research: consent (or informed consent) and written consent.

(Informed) Consent

According to Canadian legal guidelines (56, 57), "valid consent" requires:

1) that it is voluntary, i.e., "free of any suggestion of duress or coercion";
2) that the patient has the capacity to consent, i.e.:
    a) be over the age of 14 years;
    b) demonstrate sufficient mental capacity to consent to medical interventions (the threshold of mental capacity is lower than for many other types of decisions);
3) that the patient be "properly informed".

Satisfying the third condition is what confers the "informed" status on an act of consent. For it to be satisfied, the patient must be provided with "an adequate explanation about the nature of the proposed investigation or treatment and its anticipated outcome as well as the significant risks involved and alternatives available". The information provided must be of such nature so as to allow for the decision taken by the patient to be considered "informed". Furthermore, the guidelines state that the ultimate responsibility to ensure that consent is informed lies with the physician "who is to carry out the treatment or investigative procedure" (57).

Whereas the Canadian Supreme Court has concluded that the scope of the duty of disclosure "must be decided in relation to the circumstances of each particular case" (57, 58), the notion of "reasonable person" can sometimes be invoked such as in the definition of what makes risk "material" and thus to be disclosed: "A risk is thus material when a reasonable person in what the physician knows or should know to be the patient's position would be likely to attach significance to the risk or cluster of risks in determining whether or not to undergo the proposed therapy." (59)

Providing necessary information is not sufficient for consent to be considered informed. The physician also has the duty to "take reasonable steps so as to be relatively satisfied that the patient does understand the information being provided" (57).

Finally, valid consent must allow for its withdrawal at any time, by simple verbal notice (or otherwise in case of speech difficulties), thus introducing another condition for valid consent – that it be ongoing. It is especially important to ensure continuity of consent if there are any changes in the patient's condition or the treatment/diagnostic offered that may make a difference to the patient's decision.

Guidelines also make it clear that consent can be implied or explicitly expressed by the patient. Expressed consent may be expressed orally or in writing. Obtaining expressed consent is suggested when in doubt over the patient's decision.

Furthermore, the ethical implications of medical consent depend on its context, whether it is sought in the context of care for a patient (including diagnostic interventions such as prenatal tests) or in the context of medical research, for example. The present study is only interested in the concept of informed consent to treatment (including diagnostics) and will thus ignore other instances of consent, such as that given to interventions performed in the context of research, where the person giving consent may not directly benefit from the intervention.

Written consent

Written consent is unambiguously not considered to constitute informed consent: "The explanation given by the physician, the dialogue between physician and patient about the proposed treatment, is the all important element of the consent process." (57) While some Canadian jurisdictions legally require the completion of a written consent form before particular medical interventions may take place (e.g., all surgical procedures), "a signed consent form will be of relatively little value [in court] if […] the explanations were inadequate or, worse, were not given at all" (57).

Of note is the empirical evidence demonstrating that having signed a written consent form is no guarantee that the patient has understood what they allegedly consented to (60, 61). In some

circumstances, in follow-up interviews, patients think that they selected the opposite of what their signed consent form indicates (62).

Why is written consent mistaken for informed consent?

It is worthwhile to turn to the history of the use of signatures in formal contexts when trying to answer the above question. Scholars of art history have claimed that signatures in European visual art have served three principal functions: "to claim presence and 'presentness' on behalf of the artist; secondly, to assert claims to 'property' and inheritance; and finally, to guarantee originality" (63). Arguably, the second function – of property and inheritance – applies less to medical consent forms (or other contexts where signatures are taken for granted, such as on identification cards or some forms of sales receipts, for example), as it is not obvious that something of value is claimed as a result of signing the consent form. Signing to claim "presentness" – "Yes, I was here and paying attention when this document was signed" – and originality – "It was, indeed, me who agreed to the procedure, and not someone else" – do apply.

While classical painting provides a very visible example (pun not intended) of the use of signatures to represent value of some kind, it is obviously not the only example of the ritualization of signatures in modern European culture. Legal contracts and witnesses signing to attest to their witnessing are other obvious examples. Historians suggest that the use of the signature to attest to 'presentness' and authenticity in the legal context emerged in the mid-nineteenth century in colonial North America, where people found themselves forming relationships with people from outside of their communities and were looking for ways of fixing identities and relationships where these were unusually (to their participants) unfixed (64). Similarly, when the relationship with the people who traditionally knew us best – our physicians – is unfixed, as it often is in modernity, medical consent forms provide this appearance of fixing "identities and certainty amid the fear of untethered relationships and the dubious morality of relationships produced through research" (65).

There has also been work on the history of informed consent in the medical context, particularly that of Laura Stark (66). She argues that the dominance of the signed consent form in the US

beginning from the 1950s was due not to ethicists' demands or arguments that signing consent forms would make the decision taken more informed and autonomous. She concludes that the rising dominance of signed consent was rather the result of NIH lawyers advising its use to protect the NIH in lawsuits brought by research participants. Hoeyer and Hogle claim that it was not until the late 1970s and the *Belmont Report* that signed consent procedures were "powerfully reformulated […] from a matter of liability to a means of patient protection by way of guaranteeing 'anonymity' to individual patients" (2). Nevertheless, although the purpose of signing consent forms may have been "reformulated", one may entertain the notion that if the reformulated purpose is subscribed to by the signatories, then maybe the ritual of signing consent forms has come to make actual informed consent "come into being" (65). Nevertheless, Ross reminds us that consent forms "do not inevitably produce and ensure ethical interactions. At best, they produce interactions that accord with a formalist understanding of relationship, as something that can be mediated and moderated by law" (67). A formalist legal understanding of signatures ascribes it three main functions:

(1) "Finality function. The signature should make it clear that the signed document represents a completed declaration of will, and not just a draft which the signatory did not intend to be bound by."
(2) "Cautionary function. A signatory should be made aware that by his signature he is entering into a binding transaction."
(3) "Evidentiary function. A party should in case of dispute be able to use a signature for evidentiary purposes." (68)

The first two functions are incompatible with the principle of ongoing informed consent. The implications of agreeing to undergo prenatal screening are very different from those of, say, buying a house, or entering into a marriage. That a patient signs a consent form in no way suggests that the patient cannot change their mind and opt out of the procedure in question. We are thus left with only the third function, for potential use in case of dispute.

One way in which signing a consent forms can attest to a form of willfully uninformed consent is when patients make a point of visibly not reading the consent form before signing it, as a way of showing how much trust they place in the researcher, on the one hand asserting their agency

while demonstrating that this agency is purposefully uninformed (69). This paradoxical way of seemingly asserting one's autonomy does not, in fact, satisfy the SDT requirements of full autonomy.

Wynn and Israel write that written consent forms "are types of rhetoric that use symbols of powerful institutions and cultural forms that evoke rationality and modernity in order to persuade that consent and ethical research practice have coalesced into a material format" thus elevating the consent form to "fetish[1]-like" status "symbolizing transparency and ethicality" even though they "neither document nor materialize ethical research relationships" (65). The reason that some ethics boards confuse written consent for informed consent is made more clear by Hoeyer and Hogle's distinction between 'politics of intent' and 'politics of practice', where failure in practice to achieve informed consent by means of written consent only "seems to strengthen the political force of the intentions. The politics of intent operates in a moral domain: The stated intentions signal what 'ought' to be" (2).

AUTONOMY

The definition of autonomy used in the present research is that of Self-Determination Theory (SDT). Reproductive autonomy simply refers to autonomy in the context of decisions regarding one's options of reproducing (or not).

SDT defines a person as being *autonomous* when "his or her behavior is experienced as willingly enacted and when he or she fully endorses the actions in which he or she is engaged and/or the values expressed by them" (70). This definition of autonomy is thus constituted of two elements: 1) voluntariness of enacting the behavior, and 2) either endorsement of the actions or alignment of the values expressed by the actions with one's personal values. Both of these elements are required in order for the behavior to be said to be autonomous.

Ryan & Deci claim that for an act to be *fully* autonomous, it must be "endorsed by the whole self", "fully identified with" and "owned" (71). Conversely, for an act to be considered less than fully autonomous, it would lack "full endorsement" by the person. Such less than full endorsement

[1] "Fetishism invests near magical powers into things that do not actually possess them" (101).

could, for example, consist of an inner conflict over whether the act is wholly in line with our values, or in an active avoidance of reflection regarding the extent of alignment of values (71). Such a definition of autonomy goes further than the authors of the Belmont Report were willing to go when they claimed that "an autonomous person is an individual capable of deliberation about personal goals and of acting under the direction of such deliberation" (72). The SDT definition requires more than simple ability to deliberate about goals in such a manner; it actually requires for the values expressed by the act to align with one's "core" values. However, it is interesting to note that the SDT definition does not contradict the Belmont definition, but rather refines it.

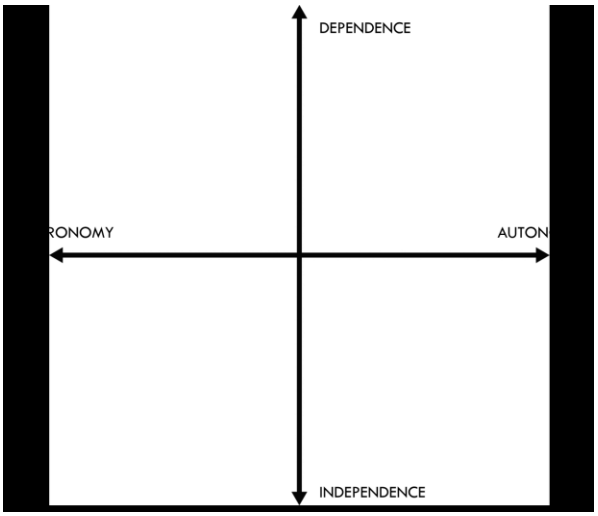
The concept of reflective autonomy as defined by SDT is coherent with the philosophy of Cornelius Castoriadis, arguably the 20th century philosopher who focused most on autonomy. Castoriadis wrote that "autonomy comes from *autos-nomos*: (to give to) oneself one's laws. […] it is hardly necessary to add: to make one's own laws, knowing that one is doing so" as well as that autonomy "does not consist in acting according to a law discovered in an immutable Reason and given once and for all. It is the unlimited self-questioning about the law and its foundations as well as the capacity, in light of this interrogation, *to make, to do* and *to institute* (therefore also, *to say*)" (73). The SDT working definition of autonomy is thus coherent with Castoriadis' thought on the subject.

If we take the SDT definition to be complete, meaning that the autonomy of an act does not depend on anything more than the elements present in the definition, we arrive at the following corollary: *Autonomy does not require an absence of external influences*. All autonomy does require is that these external influences: 1) not violate the voluntariness of an act, and 2) not contradict the values that one is trying to express with the act. Interestingly, Ricoeur acknowledged as early as 1966 that autonomy need not entail an absence of external influences, pressures, or mandates to act (74). We see, therefore, that autonomy is not equivalent to independence nor does autonomy require individualism or separateness in order to be applicable (75). SDT makes very clear that "the opposite of autonomy is not dependence but rather *heteronomy*, in which one's actions are experienced as controlled by forces that are phenomenally alien to the self or that compel one to behave in specific ways regardless of one's values or interests" (70).

The requirement that the values expressed by an act align as much as possible with the patient's own deeply held personal values means that even if she acts in a manner that completely agrees

with how her HCP is obviously trying to compel her to act in, such behavior is still autonomous if her values align with those of the HCP. In fact, Deci & Ryan recognize that "other people" could be an "important source of autonomy", granted they behave in an "autonomy-supportive and noncontrolling manner" (76, 77).

Figure 1. Autonomy Is Not Independence

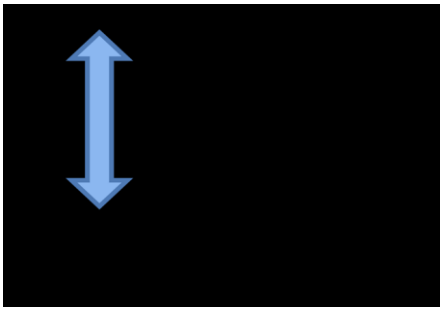


The distinction between *reflective* autonomy and *reactive* autonomy developed by Koestner and colleagues (78-80) helps us understand that autonomous decision-making does not require independence. While reflective autonomy is the autonomy defined within SDT, reactive autonomy is the "propensity to be resistant to external influences" (70), or what we sometimes call contrarianism. Within the confines of SDT, it is easy to see that resisting external influence may easily violate one's autonomy, if that external influence went in the direction of one's own values and interests to begin with.

Another useful lesson from SDT regarding autonomy is that of the continuum of motivations (71, 81). The continuum ranges from full heteronomy to full autonomy, and passes through intermediate stages, thus getting rid of any possible binary dichotomy between autonomy and heteronomy and introducing a gradient. The most heteronomous forms of motivation are *externally motivated*, meaning that what motivates a person to act in a certain manner are external controls,

namely fear of external punishment or desire of external compensation. If one acts only in order to avoid to punishment or to reap the rewards, without considering how such acts align with our own values, one is clearly not acting autonomously as defined by SDT. Less heteronomous would be *introjected motivation*, which reflects "the partial assimilation of external controls". In other words, one acts either in order to feel the approval of one's actions by others, or to avoid being

Figure 2. Gradient of Heteronomous Motivations



judged for those acts, but where no external reward or punishment act as motivators. Further along the gradient are *identified motivations* that "reflect a personal valuing of the actions". That is, my motivations are identified, if I act in a certain manner, because I believe, after deliberation, that this is the most morally correct course of action, even in the absence of other persons to witness my act, something Kant could probably get behind. Finally, Ryan & Deci define *integrated motivations* as those that are "both personally valued and well synthesized with the totality of one's values and beliefs", which is equivalent to satisfying the "full endorsement" criterion of autonomy.

Why use the SDT definition of autonomy?

In particular, using the SDT definition of autonomy allows us to see that the concept of *informed consent* can theoretically satisfy both criteria of autonomy, whereas *written consent* can only satisfy the voluntariness criterion and not the values (or "informed") criterion. Furthermore, we also see that nondirective counseling does not necessarily ensure autonomous decision-making, while it does ensure reactive autonomy.

In general, using the SDT view of reflective autonomy avoids the pitfalls that more widely used definitions of autonomy (82, 83) in the bioethics tradition are vulnerable to. Fagan defines the two key criteria for determining whether someone acts in an autonomous fashion as: 1) "whether the

patient possesses the cognitive capacity for autonomous deliberation" and 2) "whether the patient [is] free from undue external coercion or manipulation in [their] deliberations" (84), completely ignoring evaluating whether the action in question aligns with the agent's values (criterion 2 in the SDT view). This *classical* definition in bioethics "assume[s] a strong view of individuality and agency", where the individual is seen as "wholly and even necessarily self-sufficient, self-determined, self-guided—in a word, atomistic—and who is entirely free to make his or her own choices independent from social inputs" (85). Such a strong foundation of autonomy in individuality can historically be traced to the Kantian atomistic concepts of "moral agent" and "good will" (86). "The 'good' will is purely autonomous, free from contingencies and inclinations" (87), while a moral agent is an individual capable of making rational decisions compatible with their rationally formed life plan, and who assumes responsibility for the consequences of their choices (88).

While such an individualist account of autonomy is logically circumscribed within the tradition of classical Western philosophy, it has been criticized widely, being accused of "having no connection to the empirical world" (85, 87, 89-96). The atomism inherent in such a view of personhood and autonomy has been criticized on account of people's sense of identity "occupying a place in an historical and social order of persons, each of whom has a personal history interwoven with the history of a community" (90), whereas individualist autonomy has been labeled as "noncontextual and based on an abstract concept that the individual is isolated and disconnected from the many relationships within which he or she actually exists" (95). Even one of the godfathers of North American bioethics, James F. Childress has warned that "the principle of respect for autonomy is ambiguous because it focuses on only one aspect of personhood, namely self-determination . . . we would have to stress that persons are embodied, social, historical, etc." (91). Indeed, even within the parameters of Kantian moral agents establishing their values and interests within what a "good life" is for them, such considerations are necessarily impacted by the "situated and relational social determinants of the individual", determinants that individualist autonomy fails to take into account (85). Furthermore, personal values "are not the hidden and privileged property of the individual [… but] take shape publicly" (93). As the relational view of a person is a "location in a web of relatedness to others" (96), instead of an atomistic moral agent, autonomy must also be seen as "both reciprocal and collaborative […] in that it is not solely an individual enterprise" (94).

Besides the situational and relational critiques of individualist autonomy outlined above, there is what can be called the cultural critique. Anthropological literature confirms to a certain extent the individualist aspect of North American culture, where "self-determination is regarded […] as freedom from group expectations, and self-reliance is regarded as a sign of strength" (92). Simultaneously, this somewhat caricatured vision of the Western concept of a person – "legalistic-prototypically expressed in the language of rights, and central not only to our Declaration of Independence and Constitution, but to a very wide range of issues that find their way into our courts and our legislatures" (97) – is claimed to be "a minority viewpoint in the world" (84, 88). If this individualistic concept of personhood is alien to most humans on the planet, it is then claimed that "from the perspective of the world's population, the North American emphasis on individualistic autonomy is an exception to the rule" (98). If this is so, we are told that the North American model of autonomy is "unsuitable in much of the remainder of the world where the concept of "person" differs substantially from that of Western societies" (88). While the present research is carried out in North America, it purports to be applicable throughout the human world, and so problematic individualistic notions of autonomy are rejected in favour of reflective notions of autonomy, as offered by SDT.

CHAPTER FOUR: THE STUDY

METHODOLOGY

The present research uses mixed methods survey methodology (i.e., quantitative and qualitative) to empirically answer the research question. The empirical data informs normative reflection regarding reproductive autonomy and consent. The reason mixed methods is appropriate for such a study is to avoid the pitfalls of utilizing exclusively quantitative methods (such as, e.g., the studies this thesis criticizes) as well as to avoid the perceived ambiguity of exclusively qualitative methods. Whereas qualitative research can be criticized for being ungeneralizable (99) or insufficiently objective (100), quantitative research risks being wrongly interpreted (101). Even when the original quantitative research may be interpreted adequately and meaningfully, there may be room for subsequent misinterpretation by the audience; examples thereof constitute the starting point for the present analysis. Mixed methods can, therefore, facilitate "understanding complex phenomena because it allows readers to understand and explain" (102).

Data Collection and Ethics Approval

The questions used in the present study are a sub-set of the questions asked of healthcare professionals in a questionnaire administered as part of a larger research project titled PEGASUS [http://pegasus-pegase.ca/fr]. The questionnaire was developed by 3 researchers (Laberge, Ravitsky, Leclerc-Blain, the first 2 being PIs on the project), based on a review of the relevant literature (20), clinical experience of 2 of the researchers (Laberge and Leclerc-Blain), and questionnaires used in previous studies (47, 54, 103-109). The questionnaire was reviewed by 6 researchers: Légaré, Ehman, Rousseau, Wilson, Haidar, Chitty for content validity and feasibility. The questionnaire was then piloted on 4 health professionals (1 ob/gyn, 2 genetic counselors and 2 medical genetics resident) and 1 clinical research coordinator from a university medical center (CHU Ste. Justine). The final questionnaire consisted of 28 questions, as well as additional socio-demographic questions. Question formats included Likert scales, 'true or false' statements, multiple choice, and ranking. The full questionnaire is included as appendix 2. It was available as both a paper copy distributed to potential participants as well as an online version on limesurvey's platform. The survey ran from March 2015 to July 2016.

The survey's target audience consisted of Canadian professionals falling into either of the following 7 categories, and self-selecting as interacting regularly with pregnant women:

1. General practitioner
2. Pediatrician
3. Ob/Gyn
4. Clinical Geneticist
5. Genetic Counselor
6. Nurse
7. Midwife

Health professionals were recruited at 6 sites (the Newfoundland Health Science Center General Hospital as well as the 5 sites participating in PEGASUS: Ste. Justine, CRCHU de Québec, Ottawa Hospital Research Institute, BC Children's Hospital, U of Calgary), 7 academic conferences in 2015, via mailing lists of 10 Canadian professional societies who sent their members an email with a link to the survey, as well as by using the snowball technique asking the researchers associated with the study to send the questionnaire link to their personal networks. Ethics approval was obtained from the CHU Sainte-Justine associated with the University of Montreal (#3781) as well as locally from the CRCHU de Québec, the Ottawa Hospital Research Institute, BC Children's Hospital, the University of Calgary, and the Newfoundland and Labrador Health Research Ethics Authority. No particular risks associated with participating in the study were anticipated. By completing and submitting the completed questionnaire, respondents confirmed their consent to participate, as the questionnaire's cover page made explicit.

Data Analysis

All data were stored and analyzed using IBM SPSS 24. Statistical analysis consisted of Mann-Whitney U (hypotheses 1-6, 12-13) and Kruskal-Wallis (hypotheses 7-11) tests. Given that multiple statistical tests were carried out, the threshold of statistical significance (i.e., necessary to reject a null hypothesis) was selected a priori as $p<0.01$.

The alternate hypothesis always consists of two distinct possibilities: positive and negative correlation. The present study is driven by the aim to find statistical evidence for the claim that

HCPs believe written consent to not be important for NIPT due to their disdain for patients' reproductive autonomy. However, if evidence for the contrary claim arises, it shall be dealt with as well, the contrary claim here being that those HCPs who believe written consent to not be important for NIPT are precisely those who care more about patients' reproductive autonomy, or more specifically, a particular aspect of this autonomy as dealt with by each hypothesis.

Limitations

As with all surveys, we must consider the potential limitation regarding whether the study results can be taken as representative of the total population targeted, i.e., Canadian healthcare professionals routinely seeing prenatal patients. While the sample size of 184 may be able to reflect the considerable heterogeneity of Canadian HCPs treating pregnant women, a potential self-selection bias cannot be ruled out, where HCPs with more knowledge of or interest in NIPT may have participated more readily in the survey. The breakdown by main field of practice is not surprising with genetic counselors and ob/gyns dominating the respondent sample. Similarly, the geographic distribution of the sample was determined by the fact that the PEGASUS study ran in 5 hospitals in 4 provinces (BC, AB, ON, QC), although a few professionals from other provinces participated as well, due to there being additional recruitment strategies. Nevertheless, the 4 provinces mentioned above are Canada's most populous, and there is little reason to believe that any cultural heterogeneity among Canadian HCPs was overlooked due to geographic distribution.

Another limitation that applies to surveys in general is that responses to hypothetical questions on surveys do not necessarily predict what decisions the respondent would actually make in an identical real-life situation. Nevertheless, besides lengthy ethnographic observation, other methodological choices where practitioners are queried regarding their practices would have been similarly limited by participants' potentially inaccurate perception, memory, and generalization of their practices.

Importantly, it bears noting that HCPs' practices and preferences can be differently affected by relevant policies and contexts that vary between provinces and territories. In particular, at the time of the survey, only Ontario's insurance covered the cost of NIPT for high-risk pregnancies. Although, based on the study data, no conclusions were drawn concerning the relationship between attitudes towards written consent and the influence economic considerations had on professionals'

decisions to offer NIPT or not, it cannot be ruled out that HCPs' other motivations were not affected by this difference between Ontario and the rest of the country, or by other local policy differences.

Respondent Characteristics

A total of 184 HCPs completed the survey. Their demographic characteristics are summarized in the following table.

Table 1. Participant Characteristics

Characteristic	**% of Health Professionals n = 184**
Age	
Mean (SD)	41.8 (10.3)
Gender	
Female	78.3
Male	19.0
Main field of practice	
Genetic counselor	29.3
Obstetrician Gynecologist	28.8
Clinical geneticist	9.8
Nurse	6.5
Midwife	5.4
General Practitioner	3.8
Other	16.4
Years of practice	
Mean (SD)	12.4 (9.5)
Province of practice	
BC	15.8
AB	13.0
MB	0.5
ON	35.3
QC	28.3
Atlantic Provinces	3.8
Territories (Nunavut/NWT/Yukon)	0.5
Practice environment	
Public hospital	50.0
Research hospital	20.7
Private practice	15.2
Public health organization	5.4
Other	8.7
Years of experience in prenatal setting	
Mean (SD)	10.6 (9.3)

Approx. # of prenatal patients seen in prenatal setting per week	
Mean (SD)	28 (76)
Approx. % of patients at 'high risk' for Down syndrome	
Mean (SD)	26.7 (28.3)
Experience in prenatal diagnosis for Down syndrome	87.5
Currently offering NIPT	73.6
Down syndrome screening currently offering	
Integrated prenatal screening (IPS)	62.7
NIPT	55.1
First trimester screening	38.9
Quad screening	30.8
Serum IPS	30.8
Triple screening	12.4

RESULTS

Descriptive Statistics

The following tables provide an overview of how study participants responded to the questions analysed. Percentages do not include non-responses.

Table 2. Healthcare Professionals' Attitude towards Written Consent for NIPT

	Yes	No	I'm not sure
"Do you think it is important to get written consent for NIPT"	81 (44.0%)	69 (37.5%)	34 (18.5%)

Table 3. Reasons to Offer NIPT to a Patient

"Which of the following reasons would influence your decision to offer NIPT to a specific patient?"	Yes	Unchecked
"The test is recommended by professional organizations (SOGC, CCMG, ACMG)"	106 (58.2%)	76 (41.8%)
"My patient asks for the test"	92 (50.5%)	90 (49.5%)
"NIPT would allow my patient to find out early in the pregnancy whether the fetus has DS or not"	113 (62.1%)	69 (37.9%)
"If the cost of the test were covered"	92 (50.5%)	90 (49.5%)

N does not add up to 184 as 2 participants did not answer this question

Table 4. Reasons not to Offer NIPT to a Patient

"What following reasons would make you not offer NIPT to a specific patient?"	Yes	Unchecked
"My patient does not want to know whether the fetus has Down syndrome (DS)"	153 (85.5%)	26 (14.5%)
"There is insufficient clinical data on NIPT"	17 (9.5%)	162 (90.5%)
"I am not comfortable explaining the test"	6 (3.4%)	173 (94.0%)
"My patient would have to pay for the test"	39 (21.8%)	140 (78.2%)

5 participants did not respond to this question

Table 5. Healthcare Professionals' Level of Concern Regarding Societal Concerns Related to NIPT

"Provincial health care systems cover routine prenatal care. Right now, NIPT is <u>not</u> part of routine prenatal care in most provinces and territories. If NIPT were covered as part of routine prenatal care, which of the following outcomes would be of concern to you?"	1 Not concerned	2	3 Somewhat concerned	4	5 Very concerned	NA
"Increased pressure on women to use NIPT"	62 (33.9%)	33 (18.0%)	47 (25.7%)	28 (15.3%)	13 (7.1%)	1
"Increased use of NIPT leading to increased pressure to terminate if the baby has Down syndrome (DS)"	54 (29.5%)	40 (21.9%)	44 (24.0%)	23 (12.6%)	22 (12.0%)	1
"Increased availability of NIPT making people less willing to accept children with disabilities"	64 (35.0%)	35 (19.1%)	41 (22.4%)	25 (13.7%)	18 (9.8%)	1
"Reduction in resources available for people with DS and their families"	64 (35.2%)	33 (18.1%)	38 (20.9%)	24 (13.2%)	23 (12.6%)	2
"Negative impact on individuals with DS and their families (stigma, discrimination)"	61 (33.3%)	42 (23.0%)	33 (18.0%)	20 (10.9%)	27 (14.8%)	1

Participants' qualitative responses to the optional sub-question "Why?" explaining their multiple choice response to the question "Do you think it is important to get written consent for NIPT?" (the three multiple choices being "Yes", "No", and "I'm not sure") are presented in Appendix 2.

Hypothesis Testing

Given that there was a third choice *("I'm not sure"*), two sets of results are reported for completeness sake (for other combinations of comparisons, please contact the author):

1. those comparing *No* to *Yes*;
2. those comparing (*No* AND *I'm not sure*) to *Yes* (presented in table format only)

although only the first one will be the focus of the discussion.

Tables 3 and 4 present these results, respectively.

Concerns related to 'individual' autonomy

Hypothesis 1

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the patient asking for the test.

p=0.004 – **we reject the null hypothesis in favour of the alternate hypothesis**

Pearson correlation value=-0.234

Accepting the alternate hypothesis in this case, together with the fact that the correlation is negative, means that HCPs who are influenced to offer NIPT by the patient asking for the test (i.e., those who claim to be motivated by respect for the patient's choices) are more likely to believe written consent to be unimportant for NIPT.

Hypothesis 2

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by the patient not wanting to know whether the fetus has DS.

p=0.571

No conclusion can be drawn; the null hypothesis cannot be rejected.

Hypothesis 3

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the fact that "NIPT would allow my patient to find out early in the pregnancy whether the fetus has DS or not".

p<0.001 – **we reject the null hypothesis in favour of the alternate hypothesis**

Pearson correlation value=-0.295

Accepting the alternate hypothesis in this case, together with the fact that the correlation is negative, means that HCPs who claim to care about giving their patients more time to make decisions relevant to pregnancy management and related to information given by NIPT are more likely to believe written consent to be unimportant for NIPT.

Hypothesis 4

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by insufficient clinical data on NIPT.

p=0.047

No conclusion can be drawn; the null hypothesis cannot be rejected.

Note: interestingly, surprisingly few respondents said they would be motivated by such a hypothetical, perhaps not understanding the hypothetical nature of the question.

Hypothesis 5

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by the patient being unable to pay for the test.

p=0.668

No conclusion can be drawn; the null hypothesis cannot be rejected.

Hypothesis 6

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the cost of the test being covered.

p=0.321

No conclusion can be drawn; the null hypothesis cannot be rejected.

Societal Concerns

Hypothesis 7

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "increased pressure on women to use NIPT" "if NIPT were covered as part of routine prenatal care".

p=0.141

No conclusion can be drawn; the null hypothesis cannot be rejected.

Hypothesis 8

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "increased use of NIPT leading to increased pressure to terminate if the baby has DS" "if NIPT were covered as part of routine prenatal care".

p=0.283

No conclusion can be drawn; the null hypothesis cannot be rejected.

Hypothesis 9

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "increased availability of NIPT making people less willing to accept children with disabilities" "if NIPT were covered as part of routine prenatal care".

p=0.094

No conclusion can be drawn; the null hypothesis cannot be rejected.

Hypothesis 10

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "reduction in resources available for people with DS and their families" "if NIPT were covered as part of routine prenatal care".

p=0.052

No conclusion can be drawn; the null hypothesis cannot be rejected.

Hypothesis 11

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with level of concern over "negative impact on individuals with DS and their families (stigma, discrimination)" "if NIPT were covered as part of routine prenatal care".

p=0.020

No conclusion can be drawn; the null hypothesis cannot be rejected.

Seeking alternative interpretations

Hypothesis 12

H_0: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to offer NIPT to a specific patient by the test being recommended by professional organizations (SOGC, CCMG, ACMG).

p=0.009 – **we reject the null hypothesis in favour of the alternate hypothesis**

Pearson correlation value=-0.214

Accepting the alternate hypothesis in this case, together with the fact that the correlation is negative, means that HCPs influenced by professional guidelines are more likely to believe written consent to be unimportant for NIPT.

Hypothesis 13

$H_{14.0}$: Believing "it is important to get written consent for NIPT" does NOT correlate with being influenced to NOT offer NIPT to a specific patient by being uncomfortable explaining the test.

p=0.545

No conclusion can be drawn; the null hypothesis cannot be rejected.

Table 6. Results of Hypothesis Testing comparing "No" to "Yes" (disregarding the "not sure"s)

Hypothesis Tested	p	Correlation strength
Hypothesis 1 (voluntariness)	**0.004**	**-0.234**
Hypothesis 2 (right not to know)	0.571	0.047
Hypothesis 3 (early results)	**<0.001**	**-0.295**
Hypothesis 4 (evidence-base)	0.047	0.163
Hypothesis 5 (unable to pay)	0.668	-0.036
Hypothesis 6 (cost is covered)	0.321	-0.082
Societal concerns		
Hypothesis 7 (pressure to test)	0.141	0.121
Hypothesis 8 (pressure to terminate)	0.283	0.088
Hypothesis 9 (societal inclusivity)	0.094	0.137
Hypothesis 10 (societal support)	0.052	0.159
Hypothesis 11 (discrimination)	0.020	0.190
Alternative Interpretations		
Hypothesis 12 (professional recommendations)	**0.009**	**-0.214**
Hypothesis 13 (practitioner's discomfort)	0.545	-0.050

Table 7. Results of Hypothesis Testing comparing ("No" OR "not sure") to "Yes"

Hypothesis Tested	p	Correlation strength
Hypothesis 1 (voluntariness)	0.038	-0.154
Hypothesis 2 (right not to know)	0.531	0.047
Hypothesis 3 (early results)	0.030	-0.161
Hypothesis 4 (evidence-base)	0.073	0.134
Hypothesis 5 (unable to pay)	0.661	-0.033
Hypothesis 6 (cost is covered)	0.383	-0.065
Societal concerns		
Hypothesis 7 (pressure to test)	0.117	0.116
Hypothesis 8 (pressure to terminate)	0.232	0.089
Hypothesis 9 (societal inclusivity)	0.220	0.091
Hypothesis 10 (societal support)	0.125	0.114
Hypothesis 11 (discrimination)	0.049	0.146
Alternative Interpretations		
Hypothesis 12 (professional recommendations)	**0.006**	**-0.203**
Hypothesis 13 (practitioner's discomfort)	0.590	-0.041

SUMMARIZED INTERPRETATION OF SALIENT FINDINGS

In summary, three null hypotheses are rejected. However, instead of constituting evidence for the narrative that believing written consent to be unimportant in the context of NIPT coincides with a disregard for patients' reproductive autonomy, the three alternative hypotheses adopted attest to the contrary narrative, that is, believing written consent to be unimportant in the context of NIPT coincides with:

1. Being influenced to offer NIPT by the patient asking for the test;
2. Being influenced to offer NIPT by the fact that NIPT allows the patient to find out early in the pregnancy whether the fetus has DS; and
3. Being influenced to offer NIPT by the test being recommended by professional organizations.

CHAPTER FIVE: DISCUSSION

Before drawing conclusions from statistical tests, the qualitative and quantitative data is discussed, in this order.

We examine the different justifications study participants give for valuing "written consent". I place it in quotation marks here, because those were the words in the questionnaire that participants were reacting to.

Written consent does improve informed consent

One set of justifications explicitly states that written consent does lead to informed consent:

- "The exercise of a written consent may improve the information being given by the health professional."
- "Reading the consent for patients reinforces benefits and limitations of tests"

One healthcare provider, although stating that "while I think written consent improves care provider adherence to information shared", did not consider this to be sufficient justification for requiring written consent, as they did "not think that written consent should be required for the sting [blood test] to be done. It is far more important to improve the process for transmission of information to the patient."

Others' justification falls between this set ("written does improve informed") and the "materializing consent" set discussed below: "To ensure mothers realize they can opt out").

For the benefit of HCP

A few study participants claimed that the reason written consent is important is because it provides some sort of benefit to healthcare providers, either the attending one or others:

- "I think it's helpful for the practitioner to know they covered certain information with the patient. But by the same token, patients are usually emotionally overwhelmed and receiving so much information, one could argue the consent is somewhat meaningless"

- "I think it is important to document that certain information was discussed with the patient."
- "To allow all caregivers to be aware pt [patient] has received the information for this test."

Materializing consent via the ritual of signing

Some justify the importance of written consent by simply stating that "patient needs to sign". Others explain in a bit more detail why they ascribe such importance to signing:

- "If we do not formalize the consent process, NIPT will become just another routine test that patients undergo simply because it is offered; they will think their doctors recommend the test."
- "To ensure mothers realize they can opt out"

Written is assumed to refer to informed

By far, the largest set of justifications for the importance of written consent assumed that "written consent" in the question actually meant "informed consent", and answered accordingly (e.g., "So patients are informed and agree that they understand the test and the purpose of it." or making the confusion even more apparent: "I feel that informed consent is very important in the process.")

One respondent's justification could be classified among this group, but they also provide their rationale as to why they think informed consent is important: "It is not a procedure with no risk of miscarriage".

Medicolegal reasons

A quite popular justification for the importance of written consent (as well as for its unimportance, as we shall see below) is to protect the practitioner against legal liability in the future, e.g.:

- "As a written proof of acknowledging all consequences."

- "To show that consent obtained"

One respondent, while not referencing "legal protection" per se, specified that it was particularly the risk of incidental findings that made written consent required: "May get info they don't want".

Just 'cause

Finally, there are two kinds of justifications that I group as the "just 'cause" reasons. The first of these states that written consent for NIPT is required, because written consent for other types of tests ("FTS", "HIV, prenatal labs, MSS, IPS") is required. Interestingly, one participant believed that written consent for NIPT is important, even though they did not consider it to be currently required by practitioners for other screening tests: "I similarly would like to see the same consent for all genetic screening in pregnancy though".

The second of the two kinds is the "genetic exceptionalism" justification, i.e., we must get written consent, because NIPT "is a genetic test" (author's translation of French response).

And now, we go on to examine the different **justifications** study participants give **for not valuing "written consent"**.

Cumbersome

At least two practitioners said that written consent is unimportant, because it is "cumbersome":

- "If we have to get written consent for every test, it becomes cumbersome. I think consent is important, but we already have too many written forms."
- "Written consents are a hurdle and there is implicit consent when someone gets care and attend to a blood draw for the screening test."

Implicit

As the latter comment attests to, the cumbersome argument can overlap with the argument that consent is implicit, so why ask to document it:

- "Consent is implied by performing the test, ensuring that adequate counselling was provided prior"
- "for some blood tests, allowing your blood to be drawn is consent enough. I am not sure when more express consent should be obtained."
- "Implied consent by giving blood sample."

No risk, not diagnostic

I group these two sets of justifications together:

1) "because no associated risks e.g. miscarriage or fetal death..." or "Non invasive test"
   And
2) "It is not diagnostic"

This, in my opinion, is precisely the argument that some scholars assume healthcare providers have in mind when they state that written consent is unimportant. We note that it is therefore not such an implausible leap from "healthcare professionals believe written consent is unimportant for NIPT" to "NIPT's lack of risk and it not being diagnostic will cause healthcare professionals to care less about informed consent". Nevertheless, we also note that it was a justification provided by very few healthcare professionals participating in this study. While a quantitative approach to the qualitative justifications is inappropriate, just this time, I make an exception and count the comments. Only 5/86 fall in this category.

Just 'cause

Interestingly, the status quo justification (what I term "just 'cause") was provided against requiring written consent, as well, in fact, considerably more often than as an argument for requiring written consent, e.g., "I feel that if you do not need written consent for IPS you should not need it for NIPT". One participant reversed this argument somewhat, writing "If written consent to be required, should be required for any prenatal screening.", which can be interpreted in a number of ways.

It is interesting to note that this reasoning is provided on IRBs' official websites, e.g., "Signed informed consent is the standard expectation in research with human participants" (https://www.irb.cornell.edu/faq/#con2).

Written is not informed

Finally, the most common type of justification either for or against the importance of written consent was that written does not mean informed, and that what is important is that consent be informed, whether written or verbal.

The take-away message from the above discussion is that there are healthcare professionals who (1) believe that due to the nature of NIPT as compared to other screening technologies, informed consent procedures ought to be relaxed, thus eroding the principle of informed consent; as well as others who (2) believe informed consent to be of utmost importance, regardless of whether they believe written consent should be a required part of informed consent procedures or not.

In order to demonstrate that the latter group (i.e., those who care about informed consent but not written consent) is not marginal, we now turn to the quantitative results.

The three null hypotheses that were rejected give us insight into what motivates those healthcare professionals who answered that written consent was unimportant for NIPT to offer the tests to their patients. They are motivated to offer the test by:

- NIPT being able to provide results much earlier to their patient;
- their patient asking for the test; and
- by it being recommended by professional organizations.

It bears noting that the p chosen as the threshold was 0.01, and that a less conservative approach, with a p=0.1, for example would have caused the rejection of 4 more null hypotheses, all explaining the motivations to offer the test for those professionals who did respond that written consent was important for NIPT. In other words, what the analysis of quantitative results suggests

is not necessarily that all those who believe written consent to be unimportant are those who are motivated by concerns for their patients' autonomy. What it does suggest is that an important subgroup of them are, thus piercing through the narrative that claiming written consent to be unimportant is an indication of disregard for patient autonomy. With this important caveat mentioned, we can turn to analyzing each hypothesis separately.

Concerns correlating negatively with perceived importance of written consent

1. Canadian healthcare professionals who believe written consent to be unimportant for NIPT claim to be motivated to offer NIPT to their patients by the fact that NIPT provides results earlier in the pregnancy than other screening technologies. There are at least two reasons for caring about the earlier availability of results: it allows more time for decision-making, and it could allow for more options in decision-making if the patient considers termination as an option, since it may be easier to terminate a pregnancy with a fetus with an aneuploidy if the aneuploidy is discovered earlier, for social, emotional, moral and even medical reasons. Neither reason for caring about early result availability is consistent with an erosion of the principle of informed consent. We thus conclude that the alternative hypothesis adopted is one indication that perceiving written consent for NIPT to be unimportant does not coincide with eroding attitudes towards the principle of informed consent. If anything, the quantitative evidence here suggests the opposite, a narrative termed in the section above as 'written is not informed', which states that what is important is that consent be truly informed, regardless of whether it is documented by signing consent forms or not.

2. It is also the case that Canadian healthcare professionals who believe written consent to be unimportant for NIPT claim to be motivated to offer NIPT to their patients by their patients asking for the test. Rejecting the null hypothesis in this case ($p<0.004$) is the most obvious evidence for rejecting the narrative that perceived unimportance of written consent for NIPT is an indication of eroding attitudes towards informed consent procedures. Those healthcare professionals who specify that they are motivated by their patients' own stated wishes are the same ones who reject the importance of written consent for NIPT.

3. Finally, the third motivation correlating with stated unimportance of written consent is being motivated by professional recommendations. This particular finding can be interpreted in a variety

of ways. One interpretation is that healthcare professionals can believe that if professional recommendations recommend the test, why should it then matter what each individual patient thinks, explaining disregard for both informed and written consent. It is also possible that a subset of those who are influenced by guidelines and who believe written consent to be unimportant see written consent as mostly serving a legally protective role, and thus as a less necessary measure of protection, given that professional guidelines recommend the test, providing legal protection perceived as sufficient by some HCPs. Another interpretation is more consistent with the above two findings, i.e., that those motivated by professional recommendations are equally motivated by all aspects of these recommendations, one of which is the recommendation to seek informed consent (or informed request), and not just written consent.

Concerns <u>almost</u> correlating positively with perceived importance of written consent

1. The professionals who claim to be more concerned by potential discrimination of individuals living with conditions screened for by NIPT if such screening became part of routine prenatal care are also the professionals who answer that written consent is important for NIPT, albeit $p=0.02$, i.e., greater than the 1% selected as the threshold of statistical significance. (The following correlations are even less statistically significant.) In this case, it could mean that the professionals who take societal consequences of individual technology adoption into consideration are also those who believe informed consent needs to be enforced rigorously, and either believe written consent to be integral to informed consent or conflate the two notions when responding to the question. It could also mean that professionals holding such arguably pessimistic views of society, namely that routine use of NIPT to screen for certain conditions will lead to increased stigmatization and discriminations of individuals living with that condition, are also more prone to fear of litigation and thus require signed consent forms as protection against such litigation. Other interpretations of this result could no doubt be imagined, but these two examples above suggest the wide range that these interpretations can have.

2. Similarly, professionals more concerned with the routinization of NIPT leading to an erosion of social support for individuals living with DS and their families also perceive written consent for NIPT as important. Again, many interpretations can be imagined, but the one that seems most

plausible is that these are the professionals who are concerned with the unintended social consequences of liberal eugenics public health programmes, are also those who care about patients' reproductive autonomy, fear their patients' reproductive autonomy to be at risk from such unintended social consequences, and thus particularly see the importance of cultivating truly informed consent for undergoing screening among all their patients. In other words, they may believe that even patients who might believe that they want to exercise their atomistic reproductive autonomy by undergoing screening, once provided with all relevant perspectives, including the one that their exercising their own autonomy may disproportionately prevent others from doing the same, may reconsider. Such a reconsideration could constitute for some of these professionals a genuine exercise of reflexive autonomy. They then go on to answer that "written consent" is important, because this is the only question on the importance of consent they are given, and because they care too much about informed consent to quibble about whether written consent is a good proxy for informed consent.

3. Another almost correlation from this series is that of being more concerned with society becoming less inclusive of people with disabilities as a result of NIPT routinization and stating that written consent for NIPT is important. The same arguments made above apply here as well.

4. Finally, a different consideration almost correlated with stating the importance of written consent: that of being influenced to not offer the test by insufficient clinical data. First of all, less than 10% of professionals claimed to be motivated in such a way, much fewer than for any of the other criteria reported on above. This means that, due to the small N (17 HCPs motivated thus), the $p=0.047$ ought to be taken with an even greater grain of salt. Nevertheless, this finding could warrant future research to see to what extent being influenced by the clinical validity and utility of the test when offering screening to patients has any bearing on how professionals approach informed consent (as well as possibly written consent and the relationship between the two).

Concerns uncorrelated with perceived importance of written consent

Finally, we are left with the 6 hypotheses yielding p's of over 10%, not allowing us to even approximately conclude anything.

1. Being motivated by the patient not wanting to know about fetal aneuploidies correlates in no way with the perceived importance or unimportance of written consent for NIPT. This could be interpreted in the sense that both those professionals who care about consent, informed or written, and those who do not will similarly not offer NIPT to those patients who have already stated their preference not to know.

2. Being motivated by economic considerations (whether the patient can afford the test and whether the test is covered by insurance) in the decision to offer NIPT to a patient also does not correlate with the perceived importance of written consent. One possible interpretation of this finding is that economic considerations, like that of not wanting to know the status of the fetus, for those who are conscious of being motivated by them, are considerations that override others (if my patient cannot pay for the test and it is not covered by insurance, what is the point of offering it?) and are not affected by the professional's perceived importance of consent.

3. Being more concerned with routinization of NIPT leading to increased pressures on women to screen and to terminate pregnancies with DS also does not correlate with stated perceived importance of written consent. These two concerns over NIPT routinization differ from the three above in that these are potential pressures on all pregnant women faced with the decision to screen or the decision over the management of a pregnancy with a fetus with DS, whereas the other three were broader societal concerns affecting only those choosing to carry such a pregnancy to term. In other words, the social concerns subject to hypotheses 9-11 can lead to a narrowing of options (even if only psychologically) for all pregnancies (an individual might inherently appreciate raising a child with DS, but social discrimination may prevent them from going forward with doing so, a decision that would not be fully autonomous by the definition of autonomy adopted in this thesis, as explained in Chapter 2). On the other hand, pressures to test or terminate work on different levels of the gradient of heteronomous motivations, more heteronomous than being motivated by social conditions, and thus have a different relationship with truly informed consent

(or according to the numbers in this study, lack such a relationship). Re-phrasing the interpretation further, it could be the case that HCPs perceive pressure to test and terminate as less threatening to exercising one's reproductive autonomy than the less obvious societal considerations of discrimination and lack of support, and thus those who are concerned by such pressures do not have the same hope that rigorous consent procedures can mitigate them. Conversely, it is possible that the nature of these pressures, being completely dependent on the patient-HCP relationship, means that if a professional can exert pressure on their patient to screen or to terminate a pregnancy, they surely can exert the pressure necessary to sign a consent form.

4. Finally, another finding whose interpretation cannot ignore the low N of the sub-group (N=6) is that we can predict nothing about the professional's perceived importance of written consent from the fact that they claim to be motivated not to offer NIPT because they are "not comfortable explaining the test".

CONCLUSIONS

Since the 1990s, the concept of reproductive autonomy became dominant in the discourse advocating the implementation of prenatal screening into public health programmes. Nevertheless, for just as long, doubts have been voiced regarding whether, in practice, prenatal screening is actually implemented in ways that respect and promote women's reproductive autonomy. The advantages that NIPT brings to the table as compared with previously implemented screening technologies, namely the increased accuracy (resulting in a marked decrease of risky amniocentesis procedures) and earlier availability of results, are precisely the characteristics that lead to NIPT potentially exacerbating the issues related to reproductive autonomy. Besides the increased pressure that women may feel to test and possibly terminate that is due to the nature of the technology itself, the worry has been raised that healthcare professionals may additionally take informed consent procedures less seriously due to the NIPT's more precise and risk-free nature.

The present thesis takes as its point of departure a 2010 article *Will the introduction of non-invasive prenatal testing erode informed choices? An experimental study of health care professionals*, whose title suggests that an erosion of informed consent procedures was tested empirically among health care professionals. Upon careful scrutiny of the article, it turns out that

the title makes reference to results of a question posed to health care professionals regarding their views on the importance of signing a consent form. While the leap from perceiving written consent to be unimportant in a certain context to disregarding informed consent altogether seems somewhat intuitive, it is far from obvious.

The Canadian study conducted under the auspices of the PEGASUS project from 2015 to 2016 (whose data analysis was performed by the author of this thesis) also attempted to gauge healthcare professionals' attitudes toward consent. It also only posed a question on written consent, and was also originally interpreted by this author in the same way as the authors of the 2010 abovementioned article. However, since respondents to the Canadian study were given the opportunity to qualitatively explain their responses, upon analysis of these responses, it quickly became clear that interpreting the perceived unimportance of written consent for NIPT in such a way was too simplistic.

Quantitative analyses of the data yielded the correlation that Canadian healthcare professionals who responded that written consent was not important were much more likely to report that they are motivated to offer NIPT to their patients by the patient asking for the test, by the test results being available earlier in the pregnancy and by the fact that NIPT is recommended by professional organizations. The first two correlations suggest that considering written consent to be unimportant coincides rather with a certain respect for the patient's autonomy and for informed consent. The third correlation is more difficult to interpret. Two of the explanations offered herein were that being influenced by professional recommendations was an indication of overall attention to clinical validity and utility considerations or alternatively of a rather legalistic approach to consent, where written consent is mainly seen as protection against potential legal liability, and the test being recommended by professional organizations seen to negate the need for such protection.

Overall, the conclusion drawn from the hypothesis test results is that we ought to be skeptical regarding the claim that seeing written consent as important coincides with high standards of informed consent. In other words, the van den Heuvel et al. study (54) should not have used the words "informed consent" in their title and should have reported only on "written consent" making the distinction between these two explicit. Deans and Newson's follow-up paper (1) was wrong to claim that the 2010 study constituted "empirical evidence suggest[ing] that some health professionals believe consent procedures for the emerging technology of non-invasive prenatal diagnosis should become *less rigorous* than those currently used for invasive prenatal testing". To

be fair, I agree that "some health professionals" do believe that, if the sample is large enough. Nevertheless, there is absolutely no empirical evidence to suggest that there is a widespread increasing disregard for informed consent among healthcare professionals in the context of NIPT, due to NIPT involving less risk to the fetus. On the contrary, the present thesis has demonstrated that, at least in the Canadian 2015-2016 context, the converse is true: healthcare professionals, as a whole, care considerably about informed consent in the context of NIPT and are thus bringing social scientists' attention to the fact that written consent is in their opinion inadequate as a sufficient means to ensure informed consent.

The implications for future research from the findings herein are twofold. First of all, and more specifically, it is recommended that questions be formulated around concrete practices whose use or lack thereof is easily witnessed and/or around values motivating decision-making, as some of the questions in the survey on which the present thesis is based did. Scholarly concepts such as "consent" are too charged to query in a quantitative survey and ought to be left to more in-depth qualitative research. It is very difficult, without being able to ask tailored follow-up questions, to ascertain precisely what a health practitioner refers to when speaking of "consent". The survey the present thesis is based on did attempt to query respondents regarding "written consent", and the respondents rightly pointed out the inadequacy of the question in that format. Granted, out of the seemingly contradictory responses arose the research question for this thesis, but it was a mistake not worth repeating in future surveys. Avoiding such mistakes in the future would help improve the reliability of research findings regarding the critically important issue of consent for NIPT, for prenatal testing in general, and beyond – in the practice of medicine.

Second of all, and more generally, this study's results serve as a reminder to researchers relying on quantitative social science data to be more conscientious and critical of the interpretations made and how such interpretations are communicated in the literature. It is, indeed, difficult not to draw facile conclusions if they corroborate the preconceived notions the researchers may have. Nevertheless, it is precisely when we receive results that seem to corroborate our hypotheses that it is important to remain vigilant of the logic in our reasoning.

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Survey number (health professional): _____

Appendix 1. Questionnaire Used in the Study

SURVEY FOR HEALTH PROFESSIONALS

Please read the following instructions before completing the questionnaire:

STUDY DESCRIPTION
NIPT (Non-Invasive Prenatal Testing) is a new technology used in high-risk pregnancies for detecting Down syndrome and other conditions. We are trying to learn what health professionals know about NIPT and what their perceptions and attitudes are regarding its clinical implementation and use. This questionnaire is part of a larger study on NIPT, called PEGASUS, see: http://pegasus-pegase.ca/.

CONSENT
By completing and returning this questionnaire, you consent to participate in this part of the PEGASUS study and authorize Dr. Vardit Ravitsky and her colleagues to analyze the content of the completed questionnaire. Completing this survey can take about 15 minutes.

CONFIDENTIALITY
This questionnaire is anonymous. All information obtained in connection with this questionnaire will be kept confidential. Access to this questionnaire will be restricted to the members of the research team, for the duration of the study. The questionnaires will be kept in a secure place, under lock and key, for a maximum of 10 years after the project ends. The results of the study may be published, but no identifiable information will ever be disclosed.

CONTACT PERSONS
For further information regarding this project, you are welcome at any time to contact Dr. Vardit Ravitsky at (514) 343-6111 extension 3375 or at vardit.ravitsky@umontreal.ca.

INSTRUCTIONS
Please answer directly on the questionnaire. When you are finished, please seal it in the attached envelope and hand it in or return it in the pre-addressed envelope.

If you prefer to complete this questionnaire online, you can find it at:
http://nipt.hostedincanadasurveys.ca/index.php/658186/

We thank you for participating.

Survey number (health professional): _____

PART 1: WHAT DO YOU KNOW ABOUT NIPT?

1. Do you think these statements are true or false?
(PLEASE CHECK ONE ANSWER FOR EACH STATEMENT)

		True	False
a.	NIPT is currently accepted as a diagnostic test for Down syndrome (DS)	☐	☐
b.	Professional guidelines (e.g. SOGC) recommend that NIPT be offered to all pregnant women	☐	☐
c.	It is currently recommended to confirm a positive result of NIPT with invasive testing	☐	☐
d.	NIPT has a detection rate of almost 100% for DS in high risk pregnancies	☐	☐
e.	NIPT can estimate the risk for neural tube defects, like current maternal serum screening	☐	☐
f.	NIPT can be used for sex determination	☐	☐
g.	NIPT is offered only after the 15th gestational week	☐	☐

2. How comfortable are you in describing the following information about Down syndrome (DS) and NIPT to patients?
(PLEASE CHECK ONE ANSWER FOR EACH STATEMENT)

		Not comfortable		Somewhat comfortable		Very comfortable
a.	Clinical description of DS (phenotype, variability, prognosis)	1	2	3	4	5
b.	Accuracy and limits of NIPT (false-positives, false-negatives, range of conditions tested)	1	2	3	4	5
c.	Patient's personal risk assessment (according to family history, age, previous pregnancy history)	1	2	3	4	5
d.	Options available if NIPT comes back positive for DS	1	2	3	4	5
e.	Resources available for families of children with DS	1	2	3	4	5

The following sections contain information on NIPT. Please do not change your previous answers based on the information provided in the next sections. Since this is a new test, we want to know what professionals know about NIPT before answering the survey.
Thank you!

Survey number (health professional): _____

PART 2: FEATURES OF NIPT

NONINVASIVE PRENATAL TESTING (NIPT) can detect if a pregnancy is at a higher risk for Down syndrome (DS) and requires only a blood draw from the pregnant woman as early as 10 weeks gestation. There is no risk of miscarriage and it can predict with over 99% accuracy if the fetus has DS. However, it is not a diagnostic test at this time and amniocentesis should be done for confirmation. NIPT can detect higher risk of trisomy 13 and 18, but with less accuracy. It can also confirm sex, but not whether the baby has neural tube defects. Please see a comparative table of current tests (appendix).

3. How important would the following reasons be in your decision to offer NIPT (in general, not to a specific patient)?
(PLEASE CIRCLE ONE ANSWER FOR EACH STATEMENT)

		Not important		Somewhat important		Very important
a.	Absence of miscarriage risk	1	2	3	4	5
b.	Better accuracy than current screening	1	2	3	4	5
c.	Ease of use	1	2	3	4	5
d.	Recommendation of professional guidelines	1	2	3	4	5
e.	Clinical validity	1	2	3	4	5

Other:

4. When offering NIPT for DS, how important do you think it is to discuss the following information with your patient?
(PLEASE CIRCLE ONE ANSWER FOR EACH STATEMENT)

		Not important		Somewhat important		Very important
a.	Clinical description of DS (phenotype, variability, prognosis)	1	2	3	4	5
b.	Accuracy and limits of NIPT (false-positives, false-negatives, range of conditions tested)	1	2	3	4	5
c.	Patient's personal risk assessment (according to family history, age, previous pregnancy history)	1	2	3	4	5
d.	Options available if NIPT comes back positive for DS	1	2	3	4	5
e.	Resources available for families of children with DS	1	2	3	4	5

Other:

5. When do you feel is the **best** time to discuss with your patients the following features of NIPT?
(PLEASE CHECK ONE ANSWER FOR EACH STATEMENT)

		First prenatal appointment ahead of time of NIPT	Same day as blood draw for NIPT	When giving NIPT results
a.	Clinical description of DS (phenotype, variability, prognosis)	☐	☐	☐
b.	Accuracy and limits of NIPT (false-positives, false-negatives, range of conditions tested)	☐	☐	☐
c.	Patient's personal risk assessment (according to family history, age, previous pregnancy history)	☐	☐	☐
d.	Options available if NIPT comes back positive for DS	☐	☐	☐
e.	Resources available for families of children with DS	☐	☐	☐

Other:

Survey number (health professional): _____

PART 3: HOW SHOULD WE USE NIPT?

6. Do you think it is important to get written consent for NIPT?
(PLEASE CHECK ONE ANSWER ONLY)

☐ Yes ☐ No ☐ I'm not sure

Why?
_____
_____

_____
_____

7. There are different ways that NIPT can be used. Which one do you think is currently the most appropriate approach?
(PLEASE CHECK ONE ANSWER)

☐ Current screening using ultrasound and/or MSS, followed by NIPT as a second-tier screening (confirmed with amniocentesis)
☐ NIPT as first-tier screening (replacing MSS), confirmed with amniocentesis
☐ NIPT as a diagnostic test (without confirmation by amniocentesis), then availability of pregnancy termination if NIPT result is positive
☐ Other:
_____
_____

8. What following reasons would make you **not offer** NIPT to a specific patient?
(PLEASE CHECK ALL THAT APPLY)

☐ My patient does not want to know whether the fetus has Down syndrome (DS)
☐ There is insufficient clinical data on NIPT
☐ I am not comfortable explaining the test
☐ My patient and/or her partner have no family history of DS
☐ My patient would have to pay for the test
☐ Other: _____

9. Which of the following reasons would influence your decision **to offer** NIPT to a specific patient?
(PLEASE CHECK ALL THAT APPLY)

☐ The test is recommended by professional organizations (SOGC, CCMG, ACMG)
☐ My patient asks for the test
☐ My patient is at a higher risk of having a child with DS
☐ My patient or her partner has a family history of DS
☐ NIPT would allow my patient to find out early in the pregnancy whether the fetus has DS or not
☐ If the cost of the test were covered
☐ Other: _____

10. NIPT currently costs about 500-800$ in some private clinics. Who do you think should have access to NIPT free of charge?
(PLEASE CHECK ONE ANSWER ONLY)

- ☐ All women
- ☐ Low risk women only
- ☐ Other: _____
- ☐ High risk women only
- ☐ Nobody (women should pay for it)

11. To what degree do you believe that the following features are barriers to clinical implementation of NIPT?
(PLEASE CIRCLE ONE ANSWER FOR EACH STATEMENT)

		Not a barrier				**Definite barrier**
a.	Lack of coverage for the test (generally not reimbursed)	1	2	3	4	5
b.	Lack of knowledge by health professionals	1	2	3	4	5
c.	Lack of interest by the government	1	2	3	4	5
d.	Lack of interest by pregnant women and their partners	1	2	3	4	5
e.	Lack of resources (qualified lab personal, qualified labs)	1	2	3	4	5
f.	Lack of clinical validation studies	1	2	3	4	5
g.	Lack of equal access to the test	1	2	3	4	5

Other:

12. What would be the best way to inform health professionals about NIPT?
(PLEASE RANK: 1= YOUR FIRST CHOICE, 5/6 = YOUR LAST CHOICE)

- ☐ Professional guidelines
- ☐ Staff meetings
- ☐ Conferences
- ☐ Journal clubs
- ☐ Ground rounds

☐ Other: _____

PART 4: SOCIAL IMPACT OF NIPT

13. If NIPT became part of routine tests offered during pregnancy and covered by the healthcare system, do you think women would feel pressure to take it?
(PLEASE CIRCLE ONE ANSWER)

No pressure		Some pressure		A lot of pressure
1	2	3	4	5

14. Provincial health care systems cover routine prenatal care. Right now, NIPT is not part of routine prenatal care in most provinces and territories. If NIPT were covered as part of routine prenatal care, which of the following outcomes would be of concern to you?
(PLEASE CIRCLE ONE ANSWER FOR EACH STATEMENT)

		Not concerned		Somewhat concerned		Very concerne
a.	Increased pressure on women to use NIPT	1	2	3	4	5
b.	Increased use of NIPT leading to increased pressure to terminate if the baby has Down syndrome (DS)	1	2	3	4	5
c.	Increased availability of NIPT making people less willing to accept children with disabilities	1	2	3	4	5
d.	Decrease of the population of people with DS	1	2	3	4	5
e.	Reduction in resources available for people with DS and their families	1	2	3	4	5
f.	Negative impact on individuals with DS and their families (stigma, discrimination)	1	2	3	4	5

Other:

PART 5: FUTURE USES OF NIPT

15. In the **future**, NIPT may become a very reliable predictor of many genetic conditions. Are you in favour of NIPT being available for the following conditions:
(PLEASE CIRCLE ONE ANSWER FOR EACH STATEMENT)

		Not in favour		Somewhat in favour		In favour
a.	Inherited disorders (Tay-Sachs, cystic fibrosis, sickle cell disease, Gaucher disease)	1	2	3	4	5
b.	Paternity testing	1	2	3	4	5
c.	Physical and behavioural attributes (eye colour, intelligence, sexual orientation)	1	2	3	4	5
d.	Predisposition to childhood-onset diseases (autism, leukemia)	1	2	3	4	5
e.	Predisposition to late-onset diseases (heart conditions, Alzheimer's disease, cancer)	1	2	3	4	5
f.	Predisposition to mental disorders (schizophrenia, bipolar disease)	1	2	3	4	5

Other:

16. Technology today allows us to look for other chromosomal anomalies, including microdeletions and microduplications, using chromosomal microarrays or comparative genomic hybridization. How useful do you think it would be to perform such tests through NIPT in low-risk women?
(PLEASE CIRCLE ONE ANSWER)

Not useful		Somewhat useful		Very useful
1	2	3	4	5

PART 6: ABOUT YOURSELF

17. Your age: _____

18. Your gender: _____

19. What is your field of practice?
(PLEASE CHECK ONE ANSWER)

☐ General Practitioner ☐ Obstetrician/Gynecologist ☐ Genetic Counselor ☐ Midwife
☐ Pediatrician ☐ Clinical geneticist ☐ Nurse ☐ Other: _____

20. Years of practice: _____

21. In which province or territory are you **currently** practicing?
(PLEASE CHECK ONE ANSWER)

☐ Alberta ☐ New Brunswick ☐ Northwest Territories ☐ Ontario ☐ Saskatche
☐ British Columbia ☐ Newfoundland and Labrador ☐ Nunavik ☐ Prince-Edward-Island ☐ Yukon
☐ Manitoba ☐ Nova Scotia ☐ Nunavut ☐ Quebec

22. What is your **main** field of practice?
(PLEASE CHECK ONE ANSWER)

☐ Private practice ☐ Public hospital ☐ Other: _____
☐ Research hospital ☐ Public health organization

23. Number of years of experience you have working in a prenatal setting: _____

24. Approximate number of prenatal patients seen in a prenatal setting per week: _____

25. Approximate percentage of your patients who are 'high-risk' for Down syndrome: _____

26. Do you have experience in prenatal diagnosis for Down syndrome? ☐ Yes ☐ No

27. Do you currently offer NIPT? ☐ Yes ☐ No

27.1. If yes – to whom? (check all that apply)

☐ All pregnant women

- ☐ Women with pregnancies at high risk for Down syndrome after screening
- ☐ Women with pregnancies at high risk for aneuploidies based on ultrasound findings
- ☐ Other: _____

28. What type of Down syndrome screening do you currently offer to your patients?
(PLEASE CHECK ALL THAT APPLY)

- ☐ First trimester screening *(NT, free β-hCG, PAPP-A, MA)*
- ☐ Quad screening *(AFP, uE3, free β-hCG, inhibin A, MA)*
- ☐ Integrated prenatal screening (IPS) *(NT, PAPP-A, AFP, uE3, free β-hCG/total hCG, inhibin A, MA)*
- ☐ Serum IPS *(PAPP-A, AFP, uE3, free β-hCG/total hCG, inhibin A, MA)*
- ☐ Triple screening *(AFP, uE3, total hCG, MA)*
- ☐ NIPT
- ☐ Other: _____

Thank you for completing this survey.

If you have any additional comments or thoughts, please write them below.

_____

_____

_____

_____

_____

_____

_____

_____

Appendix 2. Qualitative Results (unsorted)

English Language Responses:

- it's the informed consent process which is more important than their signature
- Verbal consent is fine
- Making this question mandatory for the following reasons is not kosher!! This question is very poorly worded or the options are poorly worded as one option is missing. It is important to get consent, but consent doesn't always have to be written.
- To ensure that individuals understand issues re: "screen" vs. "test". -Discussion re: What results possible - implications of these. -Discussion re: patient understands they cab "opt out" of testing etc.
- May get info they don't want
- If written consent is obtained for FTS, it should be obtained for NIPT
- make sure the patient understands the limitations of the testing
- We don't get written consent for any other genetic test or prenatal screen
- Still an advanced screen. IPS is a screen and no woman in consented
- We do not get written consent routinely for screening or other genetic tests
- As a written proof of acknowledging all consequences.
- For medicolegal protection
- It is a blood test with no risk of complication
- Do we assume consent - when pt agrees to test?
- To allow all caregivers to be aware pt has received the information for this test.
- patient needs to understand the test & more importantly agree to have it done
- I feel that if you do not need written consent for IPS you should not need it for NIPT
- Minimal risk to mother - must understand risk of blood collection
- Informed consent
- because no associated risks e.g. miscarriage or fetal death...
- Non invasive test. Oral explanation should be enough.
- like any other screening test. HIV, prenatal labs, MSS, IPS etc
- patient needs to sign
- It is not a procedure with no risk of miscarriage

- We don't currently get written consent for MSS/IPS
- To make sure the patient understands the benefits and limitations, that a +ve result needs to be confirmed by an invasive procedure, and that it is NOT diagnostic
- Informed consent process is more important than written documentation of consent which does not necessarily equal true informed consent. Pt. consent SHOULD be documented but it doesn't need to be by a signed consent form it could be chart note
- Verbal consent is OK provided they have had an informed discussion
- I feel that the main reason to get written consent is to protect against lawsuits and so only if you were concerned about lawsuits would that be important. I think the 'active ingredient' with informed consent is the discussion, not the signature & documentation.
- So patient can testify that she was fully informed about the benefits, risks, etc of testing
- Verbal consent is sufficient
- To make sure patients understand implications
- To ensure patient understands purpose/limitations of test
- We don't get written consent for most parts of clinical care, including ultrasounds, IPS etc.
- Verbal consent should be enough
- I document in the chart
- Verbal consent if documented should be adequate.
- we don't get written consent for other prenatal screens, so why should NIPT be different? The patient should be verbally consenting and physically consenting by having the blood draw.
- It is important for women to understand the limitations and the potential follow-up testing that can come from NIPT tests. eg., if a woman is determined not to have invasive testing yet she wants a diagnostic test and screening tests, then a full discussion needs
- If we do not formalize the consent process, NIPT will become just another routine test that patients undergo simply because it is offered; they will think their doctors recommend the test.
- Written consents are a hurdle and there is implicit consent when someone gets care and attend to a blood draw for the screening test. I think as long as medical summary of visit clearly states what was discussed and what decisions were taken after discussing and

- The exercise of a written consent may improve the information being given by the health professional.
- I think it's helpful for the practitioner to know they covered certain information with the patient. But by the same token, patients are usually emotionally overwhelmed and receiving so much information, one could argue the consent is somewhat meaningless
- While i think written consent improves care provider adherence to information shared, i do not think that written consent should be required for the sting to be done. It is far more important to improve the process for transmission of information to the patient.
- So patients are informed and agree that they understand the test and the purpose of it.
- Don't for other blood tests including prenatal screening etc.
- Consent is implied by performing the test, ensuring that adequate counselling was provided prior
- Everything test should be only done with the woman's informed consent. It is a very personal decision and we are not the ones to decide what is in the best interest of the family; the couple is.
- NIPT is not a diagnostic test, but is very close to it. Therefore, I feel that informed consent is very important in the process.
- I think it is important to document that certain information was discussed with the patient. In particular that a positive NIPT result does not mean there is a 99% chance that the baby has DS
- 1) READING THE CONSENT FOR PATIENTS REINFORCES BENEFITS AND LIMITATION OF TESTS 2) medicolegal liability issue
- We don't get written consent for IPS so I don't really think you need written consent for NIPT, but I do think it's preferable to get consent.
- for some blood tests, allowing your blood to be drawn is consent enough. I am not sure when more express consent should be obtained.
- industry-led marketing is manufacturing anxiety among pregnant women and misunderstanding of the limitations of NIPS.
- Implied consent by giving blood sample. If written consent to be required, should be required for any prenatal screening.

- I don't think having written consent is a good way to ensure appropriate counseling/patient understanding
- Patient should always be informed on implications of any testing
- Verbal consent for screening test is adequate as per IPS
- Test is not perfect an it is often not well explained to patients. Ethical concerns in screen in for trisomy 21.
- It is not diagnostic
- not necessary
- To ensure mothers realize they can opt out, because the test may cause unnecessary anxiety and lead to further investigations.
- I think documented informed choice and consent is needed, but written consent not needed. NIPT rates and risks are even better than current IPS which do not require written consent
- due to the challenges with what to do with both positive and negative result - I similarly would like to see the same consent for all genetic screening in pregnancy though
- If we have to get written consent for every test, it becomes cumbersome. I think consent is important, but we already have too many written forms. We need to work better on our communication for screening tests in general (including the detailed ultrasound at
- To show that consent obtained + document certain things discussed with them
- Providing the relevant and complete information about NIPT so the client can make an informed decision is more imp than having her sign a piece of paper.
- I think as long as patients are well counselled ahead of time there is no need for written consent

French-Language Responses:

- Parce que le test est très sensible (presque diagnostique) et qu'un résultat positif aura un impact significatif pour la patiente
- Pour s'assurer que le test n'est pas prescrit à l'insu des parents; afin que ce soit basé sur un choix éclairé.
- Pour que les patientes aient pris le temps d'y réfléchir, pour qu'elles aient conscience que c'est un test différent des autres prélèvements sanguins usuels.

- D'une part, en signant un consentement les patientes prendraient plus conscience de l'engagement qu'elles font en utilisant le TPNI. Elles comprendraient qu'elles s'engagent à connaître des informations qui peuvent changer le cours de leur vie d'un côté comme
- Pour s'assurer que la patiente fait un choix libre et éclairé et que les avantages et inconvénients du test ont bien été compris.
- Trouvailles/mosaïques/ compréhension des limites et acceptation du test
- Parce qu'il s'agit d'une garantie pour le patient ET pour le professionnel de la santé. Ca permet de systématiser et uniformiser les limites d'un test, et de les officialiser.
- S'assurer que la patiente ait reçu toutes les informations et donne un consentement éclairé
- fait par dépistage sérique [illegible]
- Compréhension et preuve légale. Concentration patient.
- Comprendre les limites (FP,FN,VPP,VPN) et les tests invasifs si toni +-
- Pour indiquer et confirmer que le couple comprend bien le test et qu'ils ont réfléchi à leur décision. Pour un test comme celui, un consentement éclairé est primordial.
- Au Québec, même pour le dépistage sérique/intégré, la signature du formulaire de consentement est obligatoire. Ça donne au moins une indication sur le fait que la patiente aurait reçu un minimum d'information"
- En raison des trouvailles fortuites qui pourraient être faites lors de la réalisation du test, comme cancer...
- Dans le cas où c'est bien balisé, un note médicale claire à l'effet que la patiente est informée et accepte le test suivie d'un prélèvement sanguin qui supporte la notion de consentement aussi devrait être acceptable. Tant mieux si on a en plus de ça un
- Le consentement écrit n'est pas requis pour le programme québécois de dépistage de la T21. Cependant, il pourrait être utile de faire signer un consentement pour le TPNI de façon à uniformiser les infos transmises à la patiente.
- C'est un test génétique, donc toutes les tests génétiques ont besoin d'un consentement clair et écrit
- Consentement oral suffisant selon moi à condition que les +/- du NIPT soient expliqués aux patients.