Beyond “Being Prepared”: Women’s Realities of Navigating NIPT Across the Perinatal Continuum

by

Megan Rene Denneny

A dissertation accepted and approved in partial fulfillment of the

requirements for the degree of Doctor of Philosophy

In Communication and Media Studies

Dissertation Committee:

Dr. Autumn Shafer, Chair

Dr. Amanda Cote, Core Member

Dr. Dean Mundy, Core Member

Dr. Jocelyn Hollander, Institutional Representative

University of Oregon

Spring 2025

© 2025 Megan Rene Denneny

DISSERTATION ABSTRACT

Megan Rene Denneny

Doctor of Philosophy in Communication and Media Studies

Title: Beyond “Being Prepared”: Women’s Realities of Navigating NIPT Across the Perinatal Continuum

This dissertation addresses the intersection of health and communication in a time where technological advances are both helpful *and* leading to potentially harmful consequences, identifying a significant area for further scholarly inquiry. This duality is further complicated by the political landscape within the U.S. impacting women’s health in the realms of policy and research with many people facing complicated situations as they relate to the perinatal journey. More specifically, this study analyzes how non-invasive prenatal testing (NIPT) is communicated about through traditional means like NIPT company promotional materials to interpersonal conversations with loved ones and health practitioners and spanning to online spaces. I interviewed 30 women both across the country and the perinatal continuum to discuss their opinions, experiences, impressions, anxieties, and joys surrounding NIPT and pregnancy in general. Through these conversations I found six major themes connecting all the women, illuminating the ways in which internal and external influences impact their feelings, decisions, and interactions, despite coming from varying backgrounds. By integrating critical cultural and staged health theories with concepts of power, gender, reproductive choice, disabilities advocacy and intersecting identities, I strive to produce practical implications for interventions and policies that elevate the voices of all women.

CURRICULUM VITAE

NAME OF AUTHOR: Megan Rene Denneny

GRADUATE AND UNDERGRADUATE SCHOOLS ATTENDED:

University of Oregon, Eugene, OR
University of Denver, Denver, CO
Flagler College, St. Augustine, FL

DEGREES AWARDED:

Doctor of Philosophy in Communication and Media Studies, 2025
Master of Arts, Higher Education, 2021
Bachelor of Arts, Strategic Communication, 2014

AREAS OF SPECIAL INTEREST:

Strategic Communication
Public Relations
Health Communication
Women's Health

PROFESSIONAL EXPERIENCE:

PR Consultant, Eugene, OR
Communication Faculty, Linn Benton Community College, Albany, OR
Media Specialist, Subject Matter, Washington D.C.

PUBLICATIONS:

Denneny, M. (2024). Decoding Promises and Perceptions: A Reflexive Thematic Analysis of the Online Presentation of Noninvasive Prenatal Testing (NIPT) in Top U.S. Brands. *Journal of Consumer Health on the Internet*, *28*(2), 135–156.

ACKNOWLEDGMENTS

First, I would like to thank my committee members, Autumn, Amanda, Jocelyn, and Dean, for their invaluable mentorship and unwavering support throughout my doctoral journey. Their belief in me and in this topic has been instrumental in making this dissertation a reality. Whether through their thoughtful editing, generous letters of recommendation, or insightful advice, their contributions have been essential.

Beyond my committee, I also want to express my sincere appreciation for the many wonderful individuals I've met and collaborated with at the University of Oregon and in the Eugene community, from my supportive SOJC cohort and fellow colleagues to my friends outside the program. To Christina, a particularly insightful guide who helped me navigate this process, you are a true bright light, and I am forever grateful for you showing me the strength within myself.

To my loving Mom, this PhD would not have been possible without you. From our regular FaceTime calls to your emergency visits, you have consistently been there to celebrate my triumphs, offer comfort during challenges, and support me through even the dreariest Oregon days. You are my best friend, and I am so lucky that your belief in me has never wavered. Your lifelong encouragement to reach for the stars inspires me daily, and this accomplishment is in your honor.

To my incredible best friend and partner, Sam, I am so fortunate to have had you by my side throughout the past six years. You selflessly packed up your life to share this entire experience with me. Together, we successfully navigated moving to a new city, building our first home together, finding our community, embarking on new careers, balancing my PhD work,

exploring the beauty of the Pacific Northwest (and beyond!), welcoming a second cat into our lives (which you never thought you'd do!) and creating countless cherished memories. Through every moment – the fantastic, the mundane, the hilarious and the truly challenging – your unwavering belief in me and in us has been my constant, and for that, I am eternally grateful.

Thank you to Ryan, Jane, Rob, and Alia, you are the most important people in my world and your endless love and support have been the bedrock of this entire process. Your encouragement has been a constant source of strength, from your genuine interest in my research and teaching to your patient listening and fun adventures. I am so fortunate to have you all in my life.

DEDICATION

With deep gratitude, I dedicate this dissertation to the women who generously shared their experiences and insights, both within and beyond the scope of this study.

Table of Contents

DISSERTATION ABSTRACT *3*

CURRICULUM VITAE *4*

ACKNOWLEDGMENTS *5*

DEDICATION *7*

CHAPTER 1: INTRODUCTION *10*

CONTEXT OF RESEARCH 13

LIMITATIONS OF NIPT RESEARCH IN THE COMMUNICATION FIELD 15

PRELIMINARY RESEARCH STUDY 18

CHAPTER 2: LITERATURE REVIEW *19*

Discourses on Motherhood, Parenting, Gender, & Reproduction 19

The Prenatal Testing Debate 24

Women's Health & The Media 26

Health Behaviors & The Internet 29

Health Literacy & NIPT 30

CHAPTER 3: THEORETICAL FRAMEWORK *32*

Stuart Hall's Encoding/Decoding Model of Communication 32

Foucault & Hall Knowledge & Power 34

Precaution Adoption Process Model 35

Doing Gender 41

CHAPTER 4: METHODOLOGY *44*

Introduction 44

Rationale for Qualitative Research Design 45

In-Depth Interviewing 46

Reflexive Thematic Analysis 48

Research Setting and Context 52

Participant Sampling 54

Recruitment 59

Promotional Material Selection 62

Pre-Test 66

Ethical Considerations & Security Precautions 67

Data Collection 69

Measures Taken to Enhance Validity & Reliability **71**
Limitations **72**
Positionality **73**
Summary **75**
CHAPTER 5: FINDINGS ***75***
Answering the Research Questions **75**
RQ1: To what extent, if any, do NIPT promotional materials from large health tech organizations impact decision-making amongst pregnant women? 75
RQ2a: Do personal health beliefs and the perceived severity of genetic conditions influence an individual's stage in the Precaution Adoption Process regarding NIPT? 80
RQ2b: In what ways do personal anecdotes and experiences influence individuals' perceptions and understanding of NIPT compared to information from healthcare providers, media, and promotional materials? 82
RQ3a: In what ways do women decode NIPT messages? 85
RQ3b: Is there a difference between how pregnant women decode the messages versus those in early or considering pregnancy? 88
RQ4a: What are pregnant women's perspectives on language and images used for promoting NIPT products and how does it influence their engagement with the promotional materials? 90
RQ4b: How do expectant parents engage with promotional materials related to NIPT, and what impact does this have on their understanding and trust in the test? 96
RQ5a: What factors contribute to the decision-making process of women regarding whether or not to undergo NIPT, and how does gender play a role in this decision? 98
RQ5b: How do different communication channels influence the spread of knowledge about NIPT among parents/expectant parents? 106
RQ6: Where do most expecting parents first hear about NIPT (if at all)? 109
Themes **111**
Theme 1: Personal Perspectives –Values & Life Goals 111
Theme 2: Navigating Norms - Stigma, Autonomy & Expectations 115
Theme 3: Emotional and Psychological Impacts of Pregnancy & Loss 119
Theme 4: Navigating Healthcare Access and Support: Choices, Barriers, and Needs 122
Theme 5: Social Networks & Online Communities 126
Theme 6: Messaging Matters 134
CHAPTER 7: DISCUSSION ***138***
CHAPTER 6: CONCLUSION ***156***
REFERENCES ***158***
APPENDIX & EXHIBITS ***173***

CHAPTER 1: INTRODUCTION

New technologies can bring a sense of ease to everyday activities (McCall, 2022) but can also breed complications (Kliff & Bhatia, 2022). This may be especially true in areas like women's healthcare technology, which has grown exponentially over the last several decades. In 2011, women[1] in the U.S. gained access to non-invasive prenatal testing (NIPT), which analyzes a blood test drawn from the expectant mother in the first trimester to determine the risk that the fetus will be born with genetic anomalies. More recently, The American College of Obstetricians and Gynecology (ACOG) recommends that NIPT be available to all pregnant women, regardless of their obstetric history or risk profile. However, statistical evidence reveals that only approximately 25% to 50% of pregnant women undergo NIPT as a secondary measure (Jayashankar et al., 2023).

Further complicating the NIPT landscape, women can potentially test for rare disorders in the comfort of their own homes (Carbone et al., 2020), and large companies like LabCorp, Quest Diagnostics, and Roche, along with several start-ups, sell testing kits to one-third of all pregnant women in America (Kliff & Bhatia, 2022). In most cases, patients will take NIPT at the recommendation of a health care provider and through the typical perinatal health check appointments (Thomas et al., 2023) with access to a practitioner's evaluation and explanation of test results. However, while a doctor may order a test, sometimes results are sent directly to the patient (LabCorp, 2025). Additionally, as technology advances and access to testing becomes more available, patients can circumvent healthcare settings and order NIPT online themselves

[1] In the context of this research, the term "women" refers to those who are most likely to bear children. I recognize outside of the context of the research, the term "women" is a contentious one and that relying on reproductive criteria to establish both sex and gender has been critiqued by feminists since at least the 1960s (Lorber, 1991).

(Farrell et al., 2016). The Myriad Prequel test is the most common "at-home" option in the U.S. where consumers create a patient portal and are sent a testing kit in the mail to include a saliva sample. They are then directed to "contact Client Services to discuss blood collection options and the phlebotomist will send the specimen to Myriad for processing," later receiving results directly to the patient portal (Myriad, 2025). At the time of this dissertation, there does not seem to be conclusive research on NIPT access at home; however, several smaller international brands sell at-home kits to consumers in the U.S. through a general internet search. For example, Eugene Labs is an Australian brand that provides genetic screening capabilities testing for over 780 genes (Eugene Labs, 2025) and ships directly to the U.S. Although far less common, the varying ways consumers can explore the potential for genetic anomalies contribute to confusion around the emerging applications of NIPT. Therefore, proactively addressing this issue is crucial with the increasing convenience of self-testing and direct-to-consumer health messaging.

Bringing this issue into a national spotlight, the *New York Times* recently published an analysis critical of misleading NIPT advertising practices that promise "confidence in every result," yet lack transparency about the real accuracy of those results (New York Times, 2022). A large-scale meta-analysis of NIPT accuracy rates has also questioned the ethics NIPT marketing practices regarding how parents experience false negatives and false positives and the understanding of the real-world impact of these errors on individual families (Liehr, 2022). Liehr (2022) discusses the limitations and misperceptions around NIPT and explains that the actual effectiveness of this screening in the first trimester is still unclear. The false-negative rates (cases where NIPT fails to detect a problem) reported are probably underestimated. This is because not all negative NIPT results are thoroughly followed up, especially for disorders not covered by the test. This has led to a public perception that NIPT could replace all invasive tests and solve

genetic disorders, which is not currently accurate. Liehr suggests that more comprehensive and unbiased data is needed to understand NIPT's effectiveness. NIPT sometimes yields inconclusive results or detects unexpected conditions. Overall, Liehr supports the New York Times' argument that how false positives are represented by the major NIPT companies is misleading to consumers. The false positive rate is defined as the number of false positives divided by the number of false positives plus true negatives. By using a total number of tests taken as the denominator when calculating false positives, NIPT companies artificially deflate their advertised metrics and implicitly misuse the term "false positives." A more honest calculation would give mothers who receive a positive test result a better understanding of the accuracy of that result.

In 2022, the U.S. Food and Drug Administration warned the public of the risk of false results associated with NIPT. Due to the increasing use of the tests and an uptick in media reports, FDA experts advised consumers to be aware of "inappropriate interpretation" that could lead to premature healthcare decisions regarding pregnancy. The report cites that language used to advertise the tests may not be supported with "sound scientific evidence." Due to the issue's recent news coverage, in combination with an increase in political rhetoric around women's reproductive health, this study can be influential in increasing guidance, policy, and resources within women's healthcare communication.

Despite these findings, NIPT company website marketing claims affirmations like *"total confidence in every result"* and *"for clear answers, for fewer false alarms, for information you can trust."* Language like this may comfort nervous mothers, but it can also distract from NIPT's risks or realities. This thought process can be dangerous as some women read information

critically and seek second opinions while others have taken test results at face value and terminated pregnancies due to false positives (Liehr, 2022).

Defining "false positive" and "false negative" is important to understand why language matters to the general consumer. A false negative result indicates the absence of the genetic condition being tested when, in fact, the condition is present. A false positive result indicates the presence of the genetic condition being tested when, in fact, the condition is not present. Some researchers have identified that misunderstandings around these terms contribute to mistrust (Darling et al., 2021). The ambiguity of the terms can lead to health literacy issues, and while errors inevitably occur during these tests, understanding what each means can help women make more informed decisions about their prenatal health. This dissertation thus examines how company websites frame NIPT technology to consumers and how pregnant women potentially decode these messages. Through in-depth interviews with women and reflexive thematic analysis, this study analyzes the language and images health-tech companies disseminate about NIPT to understand what messages these influential organizations communicate and how they may impact real consumers' decision-making.

CONTEXT OF RESEARCH

This dissertation explores that while advancement in noninvasive prenatal testing (NIPT) technology is ultimately helpful, there are questions about how communication around these products is framed, how they can be interpreted, and the real-life consequences that can arise. While screening technology has evolved, there are several examples of conflicting results. Still, NIPT company marketing claims affirmations like *"total confidence in every result."* Statements like this may be designed to build confidence in mothers, who often face significant social

pressure to parent "perfectly" (Meeussen & Van Laar, 2018). These messages can also distract from NIPT's considerable risks and lean into the discursive notion that women *should* reproduce in the first place.

There is a current gap in research on how NIPT is promoted through the internet, and there is a limited number of studies that uncover ethical challenges related to communication beyond science (Bowman-Smart, 2018; Bunik, 2023; Minear et al., 2015). It is important to note that while this topic has been covered in the media via news outlets like the *New York Times*, there needs to be more scholarly literature involving NIPT and online strategic communication. Most research focuses on genetic disorders, ethics involving the test, and informed decision-making (Bowman-Smart et al., 2018; Labonté et al., 2019). To my knowledge, this is the first study to analyze promotional materials of NIPT to uncover common themes found within the discourse of this product, reproductive health, disabilities, and power within large organizations through consumer interviews.

My dissertation aims to fill these gaps to inspire new research that ultimately changes the "best practices" for health communication within the reproductive and maternal health fields, especially for women.

Finally, as political rhetoric and policy undermine women's reproductive health and continue to restrict access and education, my dissertation provides a timely perspective on how organizations can more intentionally and accurately communicate product information, reinforce the importance of choice in the termination of pregnancies, inspire policies around advertising, encourage women to ask for help, and offer additional resources in often confusing healthcare settings.

LIMITATIONS OF NIPT RESEARCH IN THE COMMUNICATION FIELD

Conversations around noninvasive prenatal testing are relatively new, as the tests themselves have only been in existence since 2011 (Allyse et al., 2015). In the U.S., the first available test was the MaterniT21Plus™ test developed by Sequenom, a variation of the original NIPT created by Professor Dennis Lo, a scientist in Hong Kong. Since the test's emergence, it has become commercialized and spread globally, and it is expected to grow into a 7.3-billion-dollar industry by 2024 (Ravitsky et al., 2021). While this dissertation focuses on the U.S. context, it is important to note that the test is now available in more than 60 countries, and there are several themes related to regulation, access, ethics, and decision-making around NIPT that researchers have begun to consider around the world (Chandrasekharan et al., 2014). Most of the research on this topic takes place abroad, primarily in European and Asian countries.

NIPT is a reproductive innovation aimed at helping both practitioners in the management of pregnancy and its counseling and future parents in developing informed choices regarding their unborn child (Carbone et al., 2020). The term "noninvasive" means that practitioners can draw blood from a pregnant person's arm to detect inherited conditions of a fetus instead of using more invasive techniques that require samples from the amniotic fluid, cells within the placenta, or umbilical blood sampling (Carbone et al., 2020). This is a desired feature for parents as some more invasive testing can add more risk to both the mother and unborn child, like miscarriage, for example (Inglis et al., 2012; Smith & Visootsak, 2013).

The global implementation of NIPT stems from the goal of improving prenatal care, and many experts in the field have invested considerable resources in promoting its integration into healthcare programs. Healthcare professionals aim to streamline the adoption of NIPT as a routine screening tool, ensuring its accessibility and effectiveness for expectant parents

worldwide to “ultimately contribute to enhanced prenatal care and improved maternal and foetal (fetal) outcomes on a global scale” (Jayashankar et al., 2023). While the intention is understandable, researchers have begun investigating some of the challenges associated with the test. For example, ethics around the test remains the most common theme in investigations into NIPT (Bowman-Smart et al., 2018; Johnston et al., 2023; Skojo et al., 2024; Zaami et al., 2021). Providing historical context, Zaami et al. (2021) is a study on informed decision-making in prenatal testing that draws upon earlier research. Specifically, it references a 2014 article analyzing a 2006 study on quad screening (a prenatal test preceding widespread NIPT use). That study revealed that many patients either declined the screening or insisted on complete understanding beforehand, illustrating that the need for robust informed consent processes has been a long-standing consideration in prenatal screening. In the study, patients remarked that they did not want to be tested or that, on the contrary, they refused to be tested without being fully aware of its function (Zaami et al., 2021). These studies also question the emotional and social implications of NIPT and how decisions may negatively affect reproductive autonomy (Weil, 2002). Both examples illuminate current ethical considerations of the test that large suppliers tend to lack nuance in promoting their products. Overall, NIPT is a useful tool to collaborate with other specialists to create safer birth plans and overall prenatal/maternal care. NIPT can be extremely helpful for parents to learn about potential health risks their child may face and predict scenarios that could affect the health of the mother, baby, or both. There are several cases where NIPT has been instrumental in saving lives and helping families by, for example, preemptively having specialists available during labor and helping parents with resources to prepare best (Norwitz & Levy, 2013).

On the other hand, there are critics of NIPT who question the ethics behind some experiences with the tool (Bowman-Smart et al., 2018; Johnston et al., 2023; Newson et al., 2023). For my dissertation, I focus on ethical communication and zoom in on potential issues that may arise from the current promotion of NIPT. Disability Studies guide a lot of this work as NIPT (while used for extremely helpful screening) connects to key areas of disability studies research. For example, *The Atlantic* recently published an article in 2020 titled "The Last Children of Down Syndrome," which tells the story of several families in Denmark, where it is normalized to take prenatal tests with the goal of detecting disabilities, namely Down Syndrome. For those with a positive diagnosis of genetic abnormality, 95 percent chose to abort. While Disability Studies will not be a focus of my dissertation, it is an important piece of the puzzle. To address these concerns, it is crucial to promote an inclusive and respectful approach toward disabilities in the context of genetic testing. This involves challenging ableist attitudes and advocating for a society that embraces diversity and values the rights and contributions of all individuals, regardless of their abilities. Additionally, healthcare providers must ensure that genetic counseling accompanies NIPT to help parents understand the complexities of test results and support them in making ethically sound decisions that align with their values and beliefs. Ultimately, the ethical considerations surrounding eugenics, genetic testing, and disabilities in relation to NIPT call for a nuanced and empathetic approach. Balancing the advancements of medical technology with the principles of inclusivity and respect for human dignity remains an ongoing challenge that requires ongoing dialogue, education, and a commitment to fostering a more equitable and compassionate society.

This dissertation explores communication and media studies and the notable intersection of health, media, and gender. These elements collaborate to perpetuate norms, power dynamics,

and ethical ambiguities. Despite the evident connection, examining the literature highlights a deficiency in scholarly efforts linking NIPT to communication. While there is work dedicated to the language used to "overestimate technology" and analyze marketing strategies associated with the test (Baldus, 2023) and studies that offer patient perspectives on preferences of the test (Thomas & Keller 2023). There is not yet a significant analysis of the combination of the two - women's experiences with NIPT in the U.S. and how marketing and technology may or may not impact decision-making. This dissertation will fill that gap by analyzing current NIPT strategic communication, how women interact with that communication, and the bigger picture of power and influence as it connects to gender and health. Overall, my research questions address: the influence of NIPT promotional materials, personal health beliefs, message interpretation, engagement with materials, critical factors, and seeking health information.

PRELIMINARY RESEARCH STUDY

This dissertation builds off a preliminary study: *Decoding Promises and Perceptions: A Reflexive Thematic Analysis of the Online Presentation of Noninvasive Prenatal Testing (NIPT) in Top U.S. Brands* published in the *Journal of Consumer Health on the Internet* (Denneny, 2024). The study analyzed the websites of ten of the largest U.S. NIPT brands according to a recent market report (Global Newswire, 2024). Each website was analyzed in terms of text (information provided about the service; messages sent about parenthood), images (what is portrayed and in what ways), and disclaimers (what, if any, warnings are provided for consumers). Findings from the initial study suggest that NIPT websites draw heavily on parental concerns about having healthy babies and offer comforting, confident language to promote their products while understating concerns about the technology and its effectiveness. This unequal balance presents several risks for consumers who are pregnant or interested in becoming

pregnant. However, one major limitation of this study is the absence of a human perspective. My dissertation aims to fill a gap where real women's voices need to be heard concerning this topic. While earlier results found that large health-tech organizations utilized potentially harmful presentations of this information, this dissertation elaborates on the themes and expands to include real-life accounts with NIPT products, insight into decision-making around pregnancy, and current discourses in action and aims to improve the understanding of issues that influence the distribution of health and healthcare within populations.

CHAPTER 2: LITERATURE REVIEW

Discourses on Motherhood, Parenting, Gender, & Reproduction

Women's reproductive history demonstrates the often complicated, restrictive, and confusing patterns that arise within women's healthcare. The added element of technical advancement also highlights how growth in product capabilities, while helpful in many ways, can be detrimental in others. My dissertation primarily explores website strategic communication and discourses around healthcare, but it is also related to the ongoing development of women's rights, particularly with attention to reproduction.

In the nineteenth century, women like Mary Ware Dennett were early crusaders in the fight for contraception and sex education in the U.S. Though they were met with resistance, their efforts ultimately legitimized birth control as an option. It was not until the 1960s, however, that Americans were introduced to the first birth control pill. While women's health care and reproductive rights have expanded within the U.S. over time (Berkman, 2011), the progress that has been made is currently under attack. In response to a Texas law banning most abortions after

about six weeks of pregnancy, the American Psychological Association expressed concern that laws restricting access to safe and legal abortions may increase symptoms of stress, anxiety, and depression (APA, 2024). The decision was made after 48 years of compliance with *Roe v. Wade (410),* the U.S. Supreme Court ruling protecting women's right to personal privacy, which implied the right to decide whether to have an abortion. Abortion dovetails with the history of prenatal testing as some women have encountered false positive or positive NIPT results confirming rare or life-threatening disorders for both the fetus and the mother. Especially in these circumstances, reproductive healthcare choices are vital (Bowman-Smart et al., 2018).

In 1972, National Institutes of Health scientists announced a new method for rapidly detecting pregnancy. *The Atlantic* reported that around the end of the 19th century and the beginning of the 20th, "scientists began to discover the chemicals that regulated various functions in the human body, including reproduction. The word 'hormone' was coined in 1905; in the 1920s, human chorionic gonadotropin (hCG)—a hormone found in high concentrations in pregnant women—was identified." In 1976, the first home test approved by the FDA, Warner-Chilcott's e.p.t. (short for "early pregnancy test," and later for "error-proof test"), hit the market. Despite its nomenclature, the e.p.t. and comparable tests can yield uncertain or incorrect results.

False negative pregnancy tests contribute to conversations about the combination of health and technology. For instance, there are two distinct ways to determine false negative results in a pregnancy test: 1) a patient may not produce enough hCG, known as the "pregnancy hormone," or 2) those who are further along in pregnancy may experience the "hook effect" in which the pregnancy hormones are incredibly high, resulting in a false result (DeLaney & Wood, 2021). Urine pregnancy testing is an affordable and widely accessible technology on the shelf of any convenience store or pharmacy. In most cases, the tests are accurate and harmless; however,

Kleinschmidt et al. (2021) recently reported several ectopic pregnancies (nonviable pregnancy outside of the uterus) in patients with negative urine pregnancy tests. These findings illuminate the importance of multiple testing methods, clear product risk messaging, and the assistance of a health professional to confirm and analyze results. Arguably, urine pregnancy tests should be used holistically and in combination with other methods for testing results like a blood draw and ultrasound; this example highlights how technology creates more accessibility and peace of mind but may not always show the whole picture. To further solidify this point, researchers tested the usability and performance of seven visual at-home pregnancy tests in Europe. The study found that while home pregnancy tests claim accuracy of >99%, for some products, these claims cannot be replicated when tested on clinical samples (Boxer et al., 2019). Pregnancy tests have greater accuracy than in the past. Still, there remains a difference in how a user at home takes a test versus how they are administered by a professional in a clinical setting, yielding different results (Bastian et al., 1998). With the continued growth of technology, a better understanding of the risks of at-home testing can potentially prevent more negative health outcomes, especially as NIPT becomes more accessible for use outside of a clinician's office.

Beyond the medical considerations, the choices women make regarding reproductive health are deeply intertwined with societal expectations and narratives. Discourses related to motherhood, parenting, and reproduction can impact decision-making and how pregnant women decode messages. The expectation for women to reproduce, the stigma of motherhood, “mom guilt,” the emotions tied to pregnancy, and pregnancy loss all affect decisions around reproductive health (Garcia et al., 2021). Women face significant pressure to be perfect mothers and to be the “main one” responsible for taking care of the children and for being fully devoted to the task, putting the child’s needs before her own” (Meeussen & Van Laar, 2018). This can

increase maternal stress, maternal guilt, and lower self-efficacy beliefs (Coxon et al., 2013; Garcia et al., 2021; Labonté et al., 2019).

These findings likely also come into play when pregnant women decide to participate in NIPT. Women feel the immense pressure to be perfect and produce "perfect" children (Meeussen & Van Laar, 2018), so much so that they would risk not only the physical health of themselves and the baby but also their psychological health by overthinking or worrying about the outcome of their pregnancy (Hore et al., 2019). The inclination to put a child's health before their own, combined with the societal strain to reproduce and be an above-average mother, frequently contributes to enhanced stress and anxiety. Initially, this may impact minor issues like sleep but can grow into more prominent concerns like depression. Furthermore, some research states that women participate in NIPT due to their moral beliefs about the meaning of prenatal testing concerning responsible motherhood (Garcia et al., 2021). Women feel responsible for producing a healthy baby, so much so that they do whatever is available to determine if a fetus has a harmful genetic condition to offer a child the healthiest life possible.

Additionally, discourses of risk, blame, and responsibility influence birth decisions for mothers (Coxon et al., 2013). For example, pregnant women that avoid in-hospital or less traditional methods of birth can be "risky" and "raise concerns." The judgment that often arises from decisions by pregnant women and mothers becomes challenging to escape. A current 'status quo' within parenting communities and the larger society can cause conflict or dissuade mothers' decisions. Knowledge and power within the U.S. media landscape often add pressure to an already stressful situation for mothers and potential mothers.

Gender, and the theoretical concept of 'doing gender,' are central threads woven throughout this dissertation topic. The topic stems from topical discourse on women's rights,

reproductive health, and the complicated and often confusing battle women have with the media and healthcare systems. While the recent post-Roe news cycle has experienced a large increase in stories of women who felt forced to carry pregnancies to term, and ignored within the legislative process, (Oetting, 2023), many of these stories began much earlier. Gender has been a subject of academic study for many decades, with significant contributions from various fields, including sociology, anthropology, psychology, and women's studies. Scholarly inquiry, while somewhat new, dates to at least the mid-20th century; however, conversations about gender have existed much longer (Meyerowitz, 2008). Today, researchers, activists, and everyday people have provided new perspectives, interpretations, and histories of gender that can better influence work, the economy, politics, and the very world we live in. Gender refers to "the characteristics, behaviors, and appearances a society dictates a person of a particular sex should perform" (et al., 2017). While the definition is helpful to clarify here, I am most interested in breaking down the components of gender that have shaped the world we live in today. The pieces I would like to explore further include the body, language, and mothering, providing a rich context for my study. While the surface-level understanding of gender is important, uncovering patterns that have been prevalent in the U.S. will be valuable.

Gender and the body are intricately linked, with unique manifestations during pregnancy and motherhood. Pregnancy, as a physiological process primarily associated with women, highlights the profound connection between the female body and the creation of new life. This biological link between the female body and childbirth has historically played a significant role in shaping gender roles and expectations. Motherhood, both as a social construct and embodied experience, is often closely tied to notions of femininity, nurturing, and caregiving. The female body's ability to bear and sustain children has been culturally revered and, at times, subjected to

medicalization, leading to complex discussions about agency, autonomy, and control over reproductive decisions.

The Prenatal Testing Debate

There is an ethical debate about whether NIPT should integrate more into healthcare systems (Bowman-Smart et al., 2018; Thomas et al., 2021). Currently, NIPT can be conducted within a medical setting, administered by a healthcare provider with results delivered by them, and in at-home settings where tests are bought directly from a company and results are delivered online. This discussion focuses primarily on marketing these commercial tests, although it is acknowledged that such marketing may also influence practices within healthcare settings. Regardless of the setting, some researchers are concerned with the mother's health, while others investigate the mental consequences of prenatal testing (Labonté et al., 2019). While early tests sought to determine the sex of a fetus or detect Down Syndrome only, NIPT has expanded to test for other chromosomal anomalies. Parents are impressed with the new features, ease of use, and clinical safety. However, others feel burdened with the internal conflict of receiving a positive test result. Even though marketing guarantees *"confidence in every result,"* confidence can quickly diminish with false positive or inaccurate results. While opinions on the technology differ, there is little research to determine whether companies appropriately advertise the product to women.

This gap in research becomes particularly relevant given that NIPT is becoming more 'routinized' in the U.S. and globally (Crabbe et al., 2019), meaning it is often a regular part of the routine within perinatal visits with health practitioners, "offered to and accepted by pregnant women without proper counseling and/or consideration" (Nijo et al., 2021). While not necessarily problematic, critics are concerned that this mindset can be associated with

diminished informed choice and eugenic attitudes (Ghiasi, 2023; Rehmann-Sutter et al., 2023). At the same time, the current American College of Obstetricians and Gynecologists (ACOG) recommends that "options should be discussed and offered to all pregnant patients regardless of maternal age or risk of chromosomal abnormality" (ACOG, 2025). However, they also note that all patients have the right to pursue or decline genetic screening. Scholars have found that most women prefer to at least have an option to take or not take NIPT as a first-tier screening (Perrot et al., 2024; Birko et al., 2019; van der Mej et al., 2023). Ultimately, the ethical dissent of NIPT hinges on balancing its increasing routine use with a commitment to informed patient choice.

Adding another layer to the ethical discussion, recent evidence shows that pregnant women or expecting parents can face psychological or societal consequences after using NIPT. Labonté et al. (2019) investigated psychological distress, anxiety, and decisional regret among women by administering four psychological tests (the Spielberger State-Trait Anxiety Inventory (STAI or short form STAI-6), the Pregnancy-Related Anxiety Questionnaire-Revised (PRAQ-R), the Kessler Psychological Distress Scale (K6) or the Decisional Regret Scale (DRS)) and distributed questionnaires to women in the study designed to detect the variables. The data suggested that NIPT did cause more stress and anxiety for women who used the product. Some evidence also supports that women may not understand the consequences or differentiation between a negative result, a false negative, a false positive, or a positive result (Piechan et al., 2016) and that communication around these results is lacking. In the *New York Times* investigation, critics were concerned that women do not understand the language used in the "fine print" of the product, and many are also dissatisfied with the communication by their doctors (Cernat et al., 2019). While most women reportedly prefer to receive instruction in using at-home tests from clinicians, many are unhappy with the quantity or quality of information

communicated. How information is presented can impact serious life decisions and health outcomes. NIPT, while innovative, raises questions within the medical community and in smaller parenting communities nationwide (Bowman-Smart et al., 2018).

Women's Health & The Media

The pressure women face on a societal level is further compounded by the advertisements they receive about health care. In the 1970s, when pregnancy detection technologies became available, advertising mirrored the current events and prevalent discourses. For example, a 1978 advertisement that read "a private little revolution that any woman can easily buy at her drugstore" contributed to the period's commentary on women's reproductive health and lifestyle. The ad includes language like "revolution" to appeal to the equal rights and opportunities women sought to attain through the women's liberation movement in the 70s. Today, research on deceptive health-related advertising targeted toward women is limited; however, there are analyses of magazine advertisements, for example, that talk about "weight" and 'weight loss" and the potential implications of language in fitness magazines (Ethan et al., 2016). The study found many advertisements supported potentially harmful beliefs and reinforced unhealthy food consumption and exercise behavior.

Similarly, messages around NIPT may include misleading claims that can bolster adverse behavior. Deceptive advertising has a long history, especially within the U.S. However, it has grown exponentially in recent years, notably due to global disasters like the coronavirus pandemic, political phenomena like "fake news," and increased use of digital media. In 2021, at the height of the pandemic, several researchers aimed to calculate the false positive rate of the virus detected through at-home tests. While results showed a relatively low failure rate, they also found the importance of a comprehensive data system that used multiple data points (Gans et al.,

2022). During this time, there was also an uptick in false testing advertisements, inaccurate claims on social media, and questions about regulations around advertising (Hussian et al., 2021).

Additionally, in 2014, the highly publicized downfall of an American privately held organization, Theranos, shed some light on the complicated relationship between health and technology (Straker et al., 2021). The company offered a compelling proposition to participate in routine blood testing by making it more convenient, using smaller blood samples, and offering lower-cost options. In 2022, Hulu debuted a biographical drama about the biotechnology company and humanized the story to draw in audiences nationwide. The popularity and sensationalism of the show raised concerns about the power large tech organizations have, especially in an arena as sensitive as health. These ongoing trends in media signify a need for a better understanding of the complex blend of health and technology, more straightforward communication, especially for consumers who administer tests themselves, and more awareness in general about the emergence of health-tech products.

Often advertisements and marketing frame information in a certain way that reflects the dominant discursive language that encourages women to reproduce in the first place (Duerksen et al., 2005). Women in the U.S. can face social and cultural consequences around the decision not to have children. My dissertation aims to change the stigmas surrounding these issues by speaking with real women to determine how NIPT marketing is decoded.

Naturally, as language changes and adapts, so does communication and its meaning**.** Gender has (and still does) play a role in media consumption as it often perpetuates the very notion that "Gender does not exist in isolation from other identity ingredients, nor does it exist in isolation from social pressures and structures that maintain it" (Palczewski et al., 2017).

These portrayals influence how individuals perceive themselves and affect how they perceive others, leading to the internalization of gender norms and expectations. Media communication is also crucial in constructing gender identities (Gill, 2007). Advertising, for instance, often employs gendered marketing strategies to target specific audiences. This includes using gender-specific language, visuals, and narratives that appeal to traditional notions of masculinity and femininity (Paek & Shah, 2003). Such practices can further reinforce the idea that certain products or behaviors are inherently tied to a particular gender, limiting individual expression and perpetuating gender-based consumerism. Moreover, the representation of gender in the media can impact self-esteem and body image, particularly for young audiences who may internalize unrealistic beauty standards perpetuated in the media (MacCallum & Widdows, 2016).

However, media communication also offers opportunities for challenging traditional gender norms and promoting gender equality. In recent years, there has been a growing awareness of the importance of diverse and inclusive representations of gender in the media. Efforts to increase the visibility of women, LGBTQ+ individuals, and other marginalized gender identities in various media forms, such as films, TV shows, and advertisements, aim to challenge stereotypes and promote more progressive gender narratives (Smith et al., 2015). Social media platforms have also provided spaces for marginalized voices to share their experiences and advocate for gender equality, amplifying diverse perspectives that challenge traditional gender roles (Senft & Baym, 2015).

Health Behaviors & The Internet

Health and technology have increasingly joined forces to produce systems, products, and interventions designed with one goal in common: to help people. While some of those relationships have been prosperous, there is an uptick of instances where the merging of industries causes harm, creates conflict, and ultimately leads into unknown territory of how to address problems and manage policy around the often-murky scenarios (Reis et al. 2013). For instance, the National Eating Disorder Association recently disabled its AI-powered chatbot for communicating harmful and inaccurate information to its users who were looking for support (National Public Radio, 2023).

The staged model of trust (Briggs et al., 2007) can be used as a lens to argue the need for research that encompasses trust in a health communication context. Some research has identified that the internet t has long been a source for people to become their own "doctors" (Sillence et al., 2007), using search engines to diagnose, research, and ultimately make decisions that impact personal health. My previous study utilized the model to highlight how language and images found on the internet can ultimately impact decision-making regarding health information and advice online. According to the staged model of trust, most users rapidly screen many websites when evaluating health information and do so using more superficial judgments. When researching NIPT, consumers would presumably type "NIPT" into a Google search and immediately be inundated with web pages that advertise, define, and sell the product. Therefore, potential NIPT users must sift through information to find "high-quality" advice.

The internet has also led to connection and community that increases camaraderie and often replaces in-person interactions for women who may be uncomfortable asking questions to primary care doctors or other people in positions of power. The concept of "intensive mothering" has emerged through the internet in spaces that encourage women and mothers to connect on

issues related to decision-making and health. Groups on Facebook, for example, have reportedly allowed moms to unite on issues, ask embarrassing questions, and seek information from others in online communities. Social media allows parallel dialogue among mothers, and "their experience is shared and valued, making mothers new experts" (Verniers et al., 2022). This idea of being a thought leader on a topic tie into the power of the internet and how people can seek any information they need at any time. While these opportunities for connection are important and helpful, they can also breed negativity and misinformation and falsely replace expert advice, especially in dire health scenarios. "Although the blogging mothers appear to have decision-making power regarding family functioning, intensive mothering sets up unrealistic standards which have costly consequences for mothers' mental health, with high rates of anxiety and stress associated with intensive mothering beliefs" (Verniers et al., 2022).

Health Literacy & NIPT

Health literacy, or the skills needed to function appropriately within the healthcare environment, has been defined as ''the degree to which individuals can obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Yee & Simon, 2014). Low functional health literacy and numeracy are often linked to poor health outcomes and are increasingly recognized mediators of health disparities in the United States (Yee & Simon, 2014); if people cannot understand what they are being told, the communication will unlikely have any meaningful impact (Fagerlin et al., 2007). Alternatively, a lack of understanding can contribute to poor decision-making, resulting in drastic measures with life-threatening results (Labonté et al., 2019). In the case of NIPT, statistical evidence about the test failure rates or individual consumer misunderstanding of the messaging could play a role in women's decision-

making. Women could terminate pregnancies, become distressed, and even avoid taking the test altogether despite available knowledge of rare potential disorders that can affect family planning. Pregnant women may not understand the risks of NIPT. While a trusted healthcare provider will ideally help inform their decisions, those lacking such support may turn to healthcare tech messaging or ads for information, leading to significant health disparities (Cernat et al., 2019). Some researchers have found that patients utilizing NIPT prefer to receive information directly from healthcare providers and that there is an overall dissatisfaction with the quality and quantity of NIPT information both provided by counselors and online (Cernat et al., 2019). In a hypothetical scenario, for example, one pregnant woman may be less confident around math and numbers and has trauma associated with going to the doctor. Another pregnant woman is married to a doctor or is a doctor herself and clearly understands statistics and how they relate to health outcomes. Both pregnant women could see NIPT marketing and decode the information in two completely different ways based on their personal experiences, knowledge, and culture. If this example is applied to a larger sample size of pregnant women, the different outcomes expand even further.

Particularly within healthcare, there are patterns related to health disparities (Travis et al., 2012), such that marginalized groups are likely to experience heightened challenges (Duerksen, 2005). How information is encoded should consider the viewpoints of differing races, languages, and classes and offer equitable resources for women to lessen healthcare gaps and adverse outcomes. One study's findings suggest that there is a lower uptake of NIPT in socioeconomically disadvantaged neighborhoods which undermines the goal of equitable access to NIPT (van der Meij et al., 2021). Similarly, Benoy (2021), describes the correlation between access to NIPT and insurance and finds that pregnant people cannot choose to take the test due to

financial barriers put into place by the lack of insurance coverage. Ultimately, health literacy is a complicated phenomenon that depends on individual experiences and societal structures within healthcare systems (Baker, 2006).

CHAPTER 3: THEORETICAL FRAMEWORK

Stuart Hall's Encoding/Decoding Model of Communication

This study utilizes Stuart Halls' encoding/decoding communication model to analyze how advertisements are produced and disseminated by big tech companies like LabCorp and Quest Diagnostics and interpreted by NIPT users. Marketing can have multiple layers of meaning and, therefore, can be decoded by people in several ways. This concept is critical to understanding the potential impact NIPT marketing can have on women. Additionally, Hall argues that one meaning, the dominant/hegemonic reading, is generally most supported by existing power structures and, therefore, is easiest to access. Hall's theory of knowledge and power is also used to view discourses around health, technology, and women. Current discourse around motherhood, like the expectation that females will reproduce, highlights a more significant issue within the U.S. Hall's ideas around knowledge and power are used to critically analyze the media landscape's view of women and motherhood and identify specific language and signs within actual NIPT advertisements that perpetuate stereotypes and norms of "perfect motherhood."

Encoding

Encoding refers to how health-tech organizations communicate to pregnant women with advertisements that employ "call to action" messages and are weighted with discursive language (Kates & Shaw-Garlock, 1999). In this example, health-tech organizations utilize advertisements to target pregnant women and encourage them to use their NIPT products. Advertisers from LabCorp have disseminated ads that say, "total confidence in every result," While the advertisers may be more focused on selling the product, a pregnant woman may interpret the messaging differently than intended by the advertiser. Hall challenges the more traditional linear mass communications model and supports the viewpoint that no matter what the advertiser may have meant, the intended audience will have various ways of decoding that information. (Hall, 1993) states, "It is not always fixed or determined by the sender, the message is never transparent, and the audience is not a passive recipient of meaning." More specifically, he suggests this "neglect is because televisual discourses use 'iconic' signs." Within the process of encoding a message, the sender, or, in this case, the advertiser, may use either verbal words, signs, and images or non-verbal body language and facial expressions symbols to help the receiver better comprehend the message that is given. In the case of NIPT advertisements, using words like "confidence" signifies a meaning that can be interpreted on a variety of levels - one person's "confident" result may be another's "catastrophic" result.

Decoding

Hall (1993) simultaneously proposes that audience members often play an active role in decoding messages as they rely on their own social contexts. Receivers of messages might be capable of changing messages themselves through collective action and can disagree with the encoder. The audience takes the message through an interpretation and translation process where

the receiver reconstructs the idea by giving meanings to symbols, often through the lens of their experiences or background, to interpret the message. In this case, pregnant women can see an advertisement for NIPT and respond to the message in a way that aligns with their personal beliefs, values, and culture. According to Hall's encoding/decoding theory, pregnant women who see the LabCorp advertisement will read in one of three ways: 1) a dominant hegemonic response where the pregnant woman or receiver completely accepts and acts precisely as the advertiser, or the sender intends. 2) a negotiated response where the pregnant woman partially believes the advertiser's message and broadly accepts it but can modify the message to align most closely with her personal experiences, interests, and positions. 3) an oppositional response where the pregnant woman disagrees with the advertiser's message and rejects the dominant ideology.

The encoding/decoding model of communication will be heavily used within the in-depth interview portion of the study. I predict that conversations with real women and their impressions of the NIPT advertisements will align with one of the three response types. Furthermore, it is predicted that most women will fall into the first response type or the 'dominant hegemonic response' as there is evidence that people tend to align with what is "most popular" or come from educated or powerful sources (Travis et al., 2012).

Foucault & Hall Knowledge & Power

The realms of motherhood, parenting, and reproduction are all pieces that work together to reinforce societal norms and pressures. These dynamics intersect with various factors, including trust in health tech organizations. There has been an increase in questions of intentions, transparency, and the potential influence of financial interests among the critics of NIPT. Ownership of such companies, coupled with money and insurance issues, further amplifies

concerns about equitable access and control over these resources. These are all reasons why this theory influences my dissertation; more succinctly, the societal pressure and expectations for mothers and women coupled with large health tech organizations aiming to make money and sell products create a perfect storm for misunderstandings and inequities, and this theory helps to explain why this tendency occurs and becomes hegemonic.

Furthermore, this landscape intersects with the concept of biopower, where control over reproductive choices and health becomes entwined with broader societal structures. Labor, both in terms of the emotional and physical efforts involved in motherhood and parenting, plays a significant role, highlighting power dynamics that underpin these domains. Foucault also argues that the greater the knowledge of something leads to the greater power of manipulation, which mirrors experts in NIPT marketing products to the public who have varying degrees of health literacy and experiences in reproductive health.

The realm of motherhood, parenting, and reproduction are all pieces that work together to reinforce societal norms and pressures. These dynamics intersect with various factors, including the trust placed in health tech organizations. There is an increase in questions of intentions, transparency, and the potential influence of financial interests that have arisen among the critics of NIPT. Foucault also argues that the greater the knowledge of something leads to the greater power of manipulation, which mirrors experts in NIPT marketing products to the public who have varying degrees of health literacy and experiences in reproductive health.

Precaution Adoption Process Model

What is PAPM?

The Precaution Adoption Process Model (PAPM) is a theoretical framework developed by Neil D. Weinstein in 1988 to explain how individuals make decisions regarding adopting or avoiding new health-related behaviors. PAPM is grounded in the idea that people go through distinct stages of behavioral change when faced with a new health threat or protective action. The model comprises seven stages: 1.) unaware of the issue, 2.) unengaged by the issue, 3.) deciding about acting, 4.) decided not to act, 5.) decided to act, 6.) acting, and 7.) maintenance. These stages form a continuum from lack of awareness to full adoption or rejection of the precautionary behavior (Glanz et al. 2008).

The PAPM emphasizes the role of perceived risk, severity of the health threat, and perceived benefits and barriers associated with adopting the precautionary behavior. It posits that individuals are likelier to adopt a precaution when they believe the health threat is severe, perceive themselves as at risk, and see the benefits of the protective action outweighing the potential obstacles. Additionally, the model highlights the importance of cues to action, such as media messages or personal experiences, which can prompt individuals to move through the stages and take preventive action. Ultimately, it seeks to identify all the stages involved when people engage in health-protective behaviors and determine factors that move people from one stage to another (Weinstein et al., 2008).

Why PAPM?

The PAPM has been widely used in public health campaigns and studies aimed at understanding and promoting healthy behaviors like HIV/AIDS, smoking cessation, and adolescent pregnancy prevention (Kreuter et al., 2004). By providing a comprehensive framework to assess individuals' decision-making processes, the PAPM allows health practitioners and policymakers to tailor

interventions to specific stages of behavior change. This approach fosters a better understanding of how to effectively communicate health information and motivate individuals to adopt preventive measures, leading to improved public health outcomes and reduced risk of illness or disease (Barnard et al., 2017). PAPM has widely been cited in studies that focus on health-promotion initiatives and identifying more effective ways to intervene in a variety of audience and health contexts (Barnard et al., 2017; Stanger-Hall & Hall, 2011). Most studies employ the model in teen and adolescent settings like schools, college health centers, and virtual spaces and collect data to enhance resources and education on topics like vaccines, advanced care planning, and teen pregnancy.

Limitations

Like any model, the PAPM has its limitations and may only partially capture some of the complexities of human behavior. Three notable limitations include the following:

1.) Lack of consideration of human variables: the theory does not consider variables like socio-economic status, education, emotion, culture, experiences, or language as components that could affect the decision to adopt or reject new health behaviors (Choi, 1997). Humans are complicated because they seldom follow a linear path, as decisions are often more complex and context-dependent (Weinstein et al., 2008). Some decision-making research argues that emotion is crucial in determining if someone adopts a precaution, especially in high-stress or dire situations (Bujnowska-Fedak & Węgierek, 2020; Slovic et al., 2007). This model, while helpful in identifying some precautionary behaviors, needs more nuance in capturing full human experiences. Furthermore, the model assumes that people make calm and rational decisions; however, some scholars have found that decision-making is influenced by heuristics, biases, and

social factors that PAPM does not address (Slovic et al., 2007). Lastly, it does not consider the different barriers that people face, like access to technology, financial assistance, and disabilities, to name a few.

2.) The model is static, simple, and linear: The model, while helpful in understanding a potential pathway to move through decision-making, does not consider how variables can change over time. There is no set length of time in each stage, which does not consider how people's perceptions, experiences, and motivations may change. For example, someone may be in the "unengaged about an issue" stage for their entire life and never get to the following stages to adopt or reject a behavior. Especially in the context of health education and prevention, this can be problematic as there is not enough data on why the intervention may or may not be working for a particular person or group. Another example is when a doctor recommends a new screening test, and the patient agrees without further deliberation (Glanz et al., 2008); both options provide little context for "why" people move or do not move from one stage to another, which leaves out a missing piece of the story. PAPM also does not consider that people may underestimate or overestimate their personal risk perceptions (Slovic et al., 2007). For example, a person can move to stage four, "decided not to act," and never engage with the issue again because they did not believe their risk was high enough to act in the first place. This could greatly impact communities that may not have reliable access to healthcare or education, for example. The model is also linear and does not account for fluidly moving around the stages. PAPM is intended to be one-directional, which does not include the outside influence that may cause people to jump from one stage to another or return to the beginning again. For example, someone could "decide not to act" and then move back to stage three, "deciding about acting" based on a

new personal experience at a later date; “forward progression is neither inevitable nor irreversible” (Glanz, 2008, pp. 125).

3.) The application of the model: PAPM works best when applied to dichotomous health behaviors like those choosing to be vaccinated vs. choosing not to be vaccinated (Glanz et al., 2008). However, health research can be more fruitful in constructing interventions, education, and other communication materials like advertising when considering the varying behaviors in reference to adopting or not adopting a new health behavior. For example, using PAPM for more complicated research can be convoluted. In the case of sun protection, there are some variables to investigate like “wore a hat” or “did not wear a hat," which would be a precise application of the model. But using other variables like “spending less time outside” can be vague as this could depend on the hours of the day, geography, UV levels, etc., all of which can change from person to person. Weinstein (2008) recommends that when using PAPM in broader contexts, researchers must define stages in concrete behaviors even though that may eliminate the reality of behaviors that impact the health intervention goal. PAPM was also developed primarily for a health context and has limitations in application to other domains like environmental behaviors or financial decisions, which would require adjustments or extensions. Often, users of PAPM recommend using this model in collaboration with other models to fill in gaps in information from the instances mentioned above.

Application of PAPM

My dissertation focuses primarily on the PAPM to understand consumer behaviors concerning NIPT. This model can help inform information needs, craft better messages, offer decision support resources, raise ethical and moral concerns, encourage informed decisions, and gather

feedback to improve testing (Weinert, 2003). I have broken down how each stage of the model influences my dissertation:

Stage 1 (Unaware of the Issue): This stage is especially valuable in understanding the prevalence of the use of NIPT and gathering data on how many people have heard of NIPT. Furthermore, this stage helps gather key context on familiarity with reproductive health, genetic testing, and pregnancy in general. It sets the stage for knowing how effective or ineffective communication and advertising around the test outline themes and why people may need to be aware of the test. If people have not heard of the test, they cannot have formed opinions about it. This model provides an opportunity to collect valuable data on those who "don't know" or "have not heard of" something. This stage is also heavily influenced by media as it has a significant influence in getting people from Stage 1 to the following stages. This is important to note as my dissertation focuses on strategic communication for NIPT, presumably a common way that people hear about the test outside of a doctor's office.

Stage 2 (Unengaged by the issue): This stage is where people have heard about NIPT and begin to form opinions about it. Perhaps they heard about it in general check-ups with a doctor, in a health podcast, or have been served advertisements on social media. However, not everyone is interested in becoming pregnant, can have children, or would consider medical or technological resources, for example. Media messages, communications from significant others, and personal experiences with NIPT all come into play in this stage and offers useful insight in answering my research questions.

Stage 3 (undecided about acting), Stage 4 (decided not to act), and Stage 5 (decided to act): These stages are often connected as research reveals important differences between people

who have yet to form opinions and those who have made decisions (Weinstein et al., 2008). These stages leave out the possibility that someone could move back to stage two when faced with a difficult decision. For example, someone could decide that taking a NIPT would be helpful or beneficial but experience an unexpected pregnancy loss, which would be an emotional and distressing experience, leading the person to go back to stage two. Beliefs about NIPT, personal choices, precaution effectiveness and difficulty, recommendations of others, perceived social norms, and fear and worry are common factors to address in this stage.

Stage 6 (Acting) and Stage 7 (Maintenance): These two stages consider variables like time, effort, resources, detailed how-to information, reminders, and other cues to action, and assistance in acting.

Doing Gender

Doing gender is a theoretical perspective developed by West and Zimmerman (1987) that emphasizes how individuals actively perform and reinforce gender through their everyday actions and interactions. According to this theory, gender is not a fixed, inherent characteristic but an ongoing accomplishment achieved through social practices. When individuals "do gender," they engage in behaviors, speech patterns, and dress codes that align with societal norms and expectations for their assigned gender. These performances create and maintain the appearance of gender conformity and contribute to the reinforcement of traditional gender roles and identities.

The social and interactional aspects of doing gender become particularly salient as women navigate the NIPT process, interpret results, and make decisions. For instance, expectations around maternal responsibility and proactive health-seeking behaviors might

influence how women engage with NIPT information and healthcare providers. Furthermore, the ways in which healthcare professionals, partners, and family members discuss and frame the testing and its potential outcomes can reinforce or challenge traditional gender roles and expectations surrounding pregnancy and parenthood. The interactional dynamics surrounding NIPT, therefore, contribute to the ongoing social construction of gender within this specific biomedical context. For instance, in many societies, men may perform masculinity by displaying assertiveness and avoiding displays of vulnerability, while women may perform femininity by displaying nurturing behaviors and adhering to certain beauty standards. These same themes apply to maternal and reproductive health, where women may feel more inclined to take NIPT to predict the probability of genetic abnormalities and ultimately do everything possible to give a future child the best life possible.

Doing gender goes beyond individual actions and extends to interactions within social institutions, such as the workplace and family. For example, in traditional work settings, certain jobs or tasks are often gendered, with men occupying leadership positions and women being overrepresented in caregiving roles. These gendered divisions of labor are reinforced through interactions and expectations within the workplace (Acker, 1990). Similarly, within families, doing gender is evident in the division of household chores, child-rearing responsibilities, and emotional labor, with men and women often adhering to specific roles and behaviors shaped by societal norms (Deutsch, 2007). These social interactions perpetuate and reproduce the gender order, shaping individual behaviors and influencing the overall gendered structure of society.

This theory weaves throughout my dissertation to critically evaluate how the NIPT industry reinforces gendered behavior and to support recommended changes for strategic communication within the industry. I also utilize this theory to demonstrate changes in gender

norms to illuminate that often women are not participating in NIPT alone and that there is often a male perspective that may not be considered in evaluations and conversations of NIPT. While it is vital to comment on gender in relation to women and mothers, it is equally relevant to consider fatherhood and the role of men in pregnancy, childbirth, reproductive health, and child-rearing.

Ultimately, understanding how women "do gender" in the context of NIPT is central to this study's analysis. It allows for examining how societal expectations surrounding motherhood, responsibility for fetal well-being, and proactive healthcare engagement influence women's decisions about NIPT, their interpretations of the results, and their interactions with healthcare providers and loved ones throughout the process. By applying this framework, the research aims to illuminate how gender is actively performed and reinforced within the specific social and technological landscape of prenatal genetic testing.

After considering the literature and theories that influence my work, my dissertation ultimately asks:

RQ1: To what extent, if any, do NIPT promotional materials from large health tech organizations impact decision-making amongst considering, currently, and recently pregnant women?

RQ2a: Do personal health beliefs and the perceived severity of genetic conditions influence an individual's stage in the Precaution Adoption Process regarding NIPT?

RQ2b: In what ways do personal anecdotes and experiences influence individuals' perceptions and understanding of NIPT compared to information from healthcare providers, media, and promotional materials?

RQ3a: In what ways do women decode NIPT messages?

RQ3b: Is there a difference between how pregnant or recently pregnant women decode the messages versus those in early or considering pregnancy?

RQ4a: What are women's perspectives on language and images used for promoting NIPT products, and how does it influence their engagement with the promotional materials?

RQ4b: How do women engage with promotional materials related to NIPT, and what impact does this have on their understanding and trust in the test?

RQ5a: What factors contribute to the decision-making process of expectant parents regarding whether or not to undergo NIPT, and how does gender play a role in this decision?

RQ5b: How do different communication channels influence the spread of knowledge about NIPT among parents/expectant parents?

RQ6: Where do most women first hear about NIPT (if at all)?

CHAPTER 4: METHODOLOGY

Introduction

The IRB approved this research study on April 22, 2024. I, along with members of my network, put up flyers in Eugene, OR and other locations including Bend, OR; Denver, CO; Arvada, CO; Washington, D.C. and St. Augustine, FL, from April 28, 2024, to July 1, 2024. I collected data

during my first scheduled interview on May 15, 2024, and continued through to my last scheduled interview on August 14, 2024. In June 2024, I posted the flyer on my personal LinkedIn page to increase participation from other U.S. cities (Darko et al., 2022). The post received eight reposts and 1,348 impressions. This was the only time I used social media for recruitment, ensuring that all comments were disabled to maintain the confidentiality of participant names and interest. I conducted in-depth semi-structured interviews and spoke with 30 women across the U.S. via Zoom. I primarily recruited participants through flyers and employed snowball sampling to connect with additional individuals. The interview transcripts were subsequently thematically analyzed (Braun & Clarke, 2021).

Rationale for Qualitative Research Design

This study builds upon a published analysis in *The Journal of Consumer Health on the Internet* (Denneny, 2024), which examined the websites of the ten most popular non-invasive prenatal testing (NIPT) brands in the U.S. While the earlier study provided valuable insights into the messaging strategies of NIPT companies, it left a critical gap by excluding the lived experiences and perspectives of individuals engaging with these technologies. This dissertation addresses that gap by centering on human experiences, allowing for a more comprehensive understanding of how women perceive and navigate NIPT.

A qualitative research design was chosen for its ability to delve into complex, nuanced phenomena, particularly in the context of women's health, where individual perspectives are often underrepresented. Qualitative methods allow for exploring implicit meanings and the influence of social, cultural, and structural contexts on participants' experiences (Beeson, 1997).

By focusing on personal narratives, this approach illuminates the intersection of health, technology, and communication in ways that quantitative methods may not fully capture.

I used semi-structured interviews as the primary data collection method to gather rich, detailed accounts of participants' thoughts, emotions, and experiences. This format provided the flexibility to adapt to the unique trajectories of each participant's narrative while ensuring consistency in addressing the study's research questions. Interviews are well-suited for exploring sensitive and complex topics like NIPT, as they foster a conversational environment that encourages openness and trust (DeJonckheere, & Vaughn, 2019). The semi-structured approach allowed participants to share their stories in their own words, shedding light on their decision-making processes, emotional responses, and perceptions of NIPT technology.

In-Depth Interviewing

In-depth interviewing serves as the cornerstone of my dissertation. This approach involves an exploration of participants' experiences, perceptions, and perspectives through open-ended questions and interactive dialogue. In-depth interviewing strives to uncover rich and nuanced insights. By engaging participants in a deep and unstructured manner, this method enabled me to delve into the intricacies of participants' thoughts, emotions, and motivations. I followed Rubin and Rubin's (2005) responsive interviewing practices, where I consider the interviewees as conversational partners, making the process more comfortable for the participant by building a relationship with them, using a friendly, gentle, and supportive tone, and following a flexible interview protocol.

I also used Annette Laureau's book *Listening to People* as a guiding framework to assist in the entire process, from the development of questions to preparing for the interview,

interacting both in-person and virtually with respondents, to recording and sharing results. Laureau's perspective is focused on listening that goes beyond the interview, "You must listen to people as you collect data, listen to feedback from others as you describe what you are learning during data collection, and "listen" to yourself as you sort through data (p. 3). Engaging in listening in different ways will help to discover new connections, reconsider assumptions, and ponder new directions, which will ultimately strengthen my work. For example, when a participant shared a vulnerable story, I responded with nods, eye contact, empathy, and a brief pause before continuing with my questions.

To ensure accuracy and credibility during the interview and analysis stages, I frequently checked in with respondents to ensure comprehension of what was being said; chose quotations that were representative of the participant's experience and not the research argument; refrained from using jargon and/or defining any use of acronyms or technical terms; attentive to potential exaggerations or omissions in interviewee accounts; and transparent with readers of the final manuscript (Rubin & Rubin, 2005). Since I am a woman who hopes to have children, I acknowledge that I am, in some ways, a part of the community I am interviewing. However, I can simultaneously be seen as an outsider as I have not yet had children, taken an NIPT, or engaged in any formal "family planning." This position can be both fruitful and complicated. On the one hand, I believe women will be more likely to trust me and speak with me openly, but on the other hand, they may infer that I do not fully understand what they have gone or are going through. As a researcher, I was mindful of the language I use and speak - in a conversational, respectful, friendly, and accessible tone.

Reflexive Thematic Analysis

This study employed reflexive thematic analysis (RTA) as described by Braun and Clarke (2021), an approach that prioritizes the researcher's active role in interpreting and constructing meaning from qualitative data. RTA provided a flexible and iterative framework to explore participants' experiences and critically engage with the broader societal and cultural contexts influencing their narratives. This method was well-suited to the study's feminist and constructionist orientation, emphasizing reflexivity, the complexity of meaning, and the interrogation of power dynamics in health communication. Themes were developed through an iterative process of coding and analysis, guided by theoretical constructs, yet open to the emergence of new patterns within the data.

RTA offers multiple analytic variations that reflect its adaptability. This study adopted a deductive approach, wherein existing theoretical frameworks shaped the analysis, and a latent focus was used to uncover implicit meanings embedded in participants' accounts. A constructionist and critical qualitative framework underpinned the analysis, which posits that our understanding of reality is socially constructed through interactions, language, and shared meanings. In qualitative research, the researcher aims to explore how individuals and groups create and interpret their experiences within specific social and cultural contexts. More specifically, this allowed for an interrogation of the social and cultural contexts that shaped participants' experiences and the power structures reflected in their narratives. This approach was aligned with feminist methodologies, which value researcher reflexivity and seek to challenge dominant narratives, particularly in contexts involving marginalized populations. The clustering of deductive, latent, and constructionist approaches created a coherent analytic strategy tailored to the study's goals.

Reflexivity was central to the RTA (Braun & Clarke, 2021) process, acknowledging that the researcher's positionality is both a resource and an influence in qualitative research. Following Berger's (2015) conceptualization, reflexivity involved turning the lens inward to recognize and take responsibility for how my situatedness shaped my questions, the data I collected, and the themes I constructed. Throughout the analysis, I maintained a reflexive journal to document evolving thoughts, analytic decisions, and my reactions to the data. This journal served as a space to critically engage with my assumptions, challenge my interpretations, and consider alternative perspectives. Reflexivity in this context was not a static endpoint but an ongoing practice informing each analysis stage.

The six-phase process of RTA guided the analytic work. Phase one involved familiarizing myself with the dataset through repeated engagement with the interview transcripts, including listening to the recordings and reading the transcripts multiple times. This immersion allowed me to critically engage with the data, moving beyond surface-level understanding to ask deeper questions about participants' narratives. I reflected on how participants made sense of their experiences, what assumptions underpinned their accounts, and the social norms embedded within their stories.

Phase two involved systematic coding, where data segments that appeared meaningful, relevant, or engaging were identified and labeled. These codes captured specific and detailed meanings, which were collated into a comprehensive dataset for further analysis. For instance, when mothers discussed their decision-making process around NIPT, I reflected on the societal pressures and expectations placed on pregnant individuals to pursue all available screening technologies, and how these norms might intersect with individual values and experiences of motherhood.

In phase three, initial themes were generated by clustering related codes to identify patterns of shared meaning across the dataset. Themes represented broader analytic concepts that addressed the research questions, requiring active interpretation to move beyond the specificity of individual codes. For example, initial themes began as broader subjects such as "being prepared," which then prompted further analysis to understand the underlying motivations and anxieties associated with this desire for preparedness.

The development of themes continued into phase four, where themes were reviewed and refined to ensure they told a compelling story about the data. This phase involved merging or splitting themes, discarding redundant patterns, and situating the analysis within the wider context of feminist health communication.

Phase five focused on defining and naming themes. Each theme was refined to ensure clarity and coherence, and concise and descriptive names were developed to capture its essence. This often involved going back to the data extracts to ensure the theme accurately reflected the nuances within those extracts and differentiated it from other emerging themes. This also resulted in sub-themes demonstrating the layered complexity of the six themes.

Writing began early in the analytic process and became more formalized during phase six, where themes were woven together into a coherent narrative that addressed the research questions and engaged with the theoretical framework. This narrative combined analytic insights with vivid data extracts to create a compelling and accessible account of the study's findings.

Throughout the process, RTA's iterative nature provided flexibility, ensuring the analysis remained grounded in the data while being informed by critical and theoretical considerations. RTA facilitated a nuanced understanding of participants' experiences and the broader social structures shaping their realities by embracing reflexivity, critical engagement, and the interplay

of theoretical and empirical insights. This approach aligned seamlessly with the study's feminist, constructionist, and critical commitments, offering a rigorous and ethically grounded method for qualitative analysis.

For the coding and analysis, I followed Braun and Clarke's (2021) thematic analysis guidelines. I documented each stage of the coding and theme development process clearly, ensuring that the evolution of themes was transparent and traceable. This helped to maintain rigor in the research and ensured the process was dependable.

To start, I familiarized myself with the data by reading through the transcripts several times while taking preliminary notes. Since data collection spanned over a period, I began coding the transcribed interviews before the entire dataset was available. I read each transcript line by line and added initial codes alongside the text. As I revisited the interviews over time, these codes were refined and expanded. I made sure to revisit sections with less coding to ensure they were not overlooked.

Once I finished the initial coding, I searched for larger patterns across the dataset and grouped the codes into themes, as suggested by Braun & Clarke (2021). To check whether the themes reflected participants' actual meanings, I imagined the theme titles being spoken by the participants themselves. Instead of focusing on a data-driven approach, I tried to avoid letting previous research overly influence my coding and theme development. Given the diversity of experiences in the interviews, I also provided a sense of prevalence and alternative perspectives when discussing specific experiences that were not universal among participants.

I created a comprehensive directory of themes and sub-themes, with relevant participant quotations placed under each heading. This helped me refine the themes' titles and boundaries, ensured they accurately represented the data, and made writing the analysis easier.

The coding and theme development process was both descriptive and interpretive. Descriptively, I aimed to represent what participants said, while interpretively, I considered underlying patterns influenced by social context. This interpretative approach was especially important because participants often struggled to express their experiences clearly, and some even did not understand the mechanisms behind their picking behaviors. By taking an interpretative stance, I was able to make sense of these experiences and connect them with existing literature. Writing played a key role in refining my analysis, as it allowed me to adjust the boundaries of themes and identify latent patterns.

Given the diverse nature of selecting experiences, I made sure not to overly focus on one type of experience at the expense of others. I actively looked for experiences that diverged from the emerging themes to ensure that the final analysis was well-rounded and balanced. When incorporating participant quotations, I always revisited the original context to make sure I accurately represented their words.

Research Setting and Context

The study was conducted via Zoom, an online video conferencing platform that facilitated remote data collection while preserving the interpersonal qualities of face-to-face interactions. Conducting interviews via Zoom offered significant benefits, such as convenience and accessibility, allowing participants to engage in the research process from their own environments, regardless of geographic location. This approach minimized barriers to participation, including time constraints and travel logistics, making the study more inclusive and accommodating. For example, new mothers could speak with me while caring for their newborn. The virtual interviews were held in a secure and private setting in the researcher's residence,

ensuring both confidentiality and professionalism. Participants were encouraged to select a private and quiet space for the interview to maintain their comfort and minimize disruptions.

To ensure secure and seamless interactions, each Zoom meeting was scheduled through Calendly, linked to the researcher's University of Oregon email account. Every meeting included a unique link and passcode to protect against unauthorized access. During interviews, the researcher took care to build rapport with participants, starting with informal conversations and creating a supportive atmosphere. This attention to interpersonal connection was essential for fostering trust, which is sometimes more challenging to achieve in virtual settings. Participants were also offered a brief overview of Zoom's features to ensure they felt confident navigating the platform and to reduce any potential anxieties about the technology.

Each Zoom interview was recorded with the participant's consent and saved directly to the researcher's password-protected personal computer in a secure folder. To protect participant privacy, recordings were anonymized with generic file names such as "Interview Participant 1" and numbered sequentially. No identifying information was included in file names or any accompanying documentation. Backup copies of the recordings were created and stored in a secondary secure location to guard against data loss. All recordings were stored in compliance with institutional data management guidelines and will be securely deleted after the completion of the study. In addition to technical safeguards, measures were taken to address potential challenges, such as internet connectivity issues or interruptions during the interviews.

The researcher communicated with participants ahead of time to outline troubleshooting steps in case of technical difficulties, ensuring minimal disruption to the interview process. Participants were informed about the confidentiality measures in place, including the secure storage of recordings and the anonymization of their data. These steps were taken to provide

transparency and reassurance about how their information would be handled, fostering trust and participation.

The decision to use Zoom as the primary platform was influenced by its accessibility, widespread familiarity, and robust security features, such as encrypted meetings and password protection. This choice aligned with institutional ethical guidelines and allowed for a methodologically sound approach to remote qualitative research. By carefully considering participant comfort, technical contingencies, and data security, the virtual interview setting ensured that the study maintained a high standard of ethical rigor and methodological reliability.

Participant Sampling

Participants for this study were purposefully selected based on their experiences with pregnancy and the decision-making processes surrounding NIPT. To capture a range of perspectives, participants were categorized into three groups: individuals considering pregnancy, those who were currently pregnant (first, second, or third trimester), and those who had recently given birth (within 6 months). This diverse sampling strategy allowed for an exploration of the topic across different stages of the reproductive journey, ensuring that the findings reflected a variety of experiences and viewpoints.

The inclusion of individuals considering pregnancy offered insights into anticipatory decision-making and perceptions of NIPT before direct engagement with prenatal care. Current pregnant participants provided real-time reflections on navigating prenatal testing, including emotional, informational, and logistical considerations. Recently pregnant individuals contributed retrospective accounts, offering the benefit of hindsight and a broader view of the testing's long-term impacts on their decision-making and well-being.

This purposeful sampling approach ensured that the study remained focused on the lived experiences of women and birthing individuals at key moments in their reproductive journeys while also capturing the nuanced ways that experiences with NIPT might differ based on one's relationship to pregnancy. By including these three groups, the study aimed to develop a comprehensive understanding of how NIPT is perceived, understood, and experienced, contributing to a richer and more inclusive analysis.

Due to the semi-structured nature, I used one interview protocol for all three participant types. The questions about NIPT and promotional materials were the same, but when asking about individual experiences, the interviews would go in different directions. This was important because while personal stories shared by each participant differed significantly, there were common themes, observations, and questions among them. Including perspectives from the perinatal continuum provides practical insights for women at any stage in their journey. As I found out, those considering pregnancy were perhaps more interested in NIPT than those already or recently pregnant, highlighting a need for education and resources within earlier perinatal stages. I also decided to include those who have experienced IVF as those participants had insightful connections to NIPT and were an important piece of their story.

Audience 1: Considering Pregnancy Criteria

a. Women who are actively trying to conceive
b. Women thinking about pregnancy, pretesting, "almost" pregnant
c. Can be participating in IVF
d. Does not have to know about NIPT before the interview or used it in any capacity

Audience 2: Currently Pregnant Criteria

a. Could have other children already
b. Presently pregnant (first, second, or third trimester)
c. Does not have to know about NIPT before interview or used it in any capacity
d. Can have experience with IVF

Audience 3: Recently Pregnant Criteria

a. Must have been recently pregnant (within 6 months)
b. Could have other children already
c. Can have experience with IVF
d. Does not have to know about NIPT before the interview or used it in any capacity

These three audiences were selected to offer data through various perinatal stages. More specifically, Audience 1 (*n*= 8) is at a critical decision-making juncture regarding prenatal care and testing, making their perspectives particularly valuable. Women actively trying to conceive or in the early stages of family planning like considering IVF, for example, are likely to be highly engaged in learning about prenatal health options, including NIPT and doctors often recommend the procedure at this point in a prenatal journey. Their decisions and attitudes towards these tests can offer insights into how NIPT is perceived and valued at the very beginning of the pregnancy journey. Moreover, including women who are thinking about pregnancy or in the pretesting phase broadens the scope of the study to capture the anticipatory attitudes and knowledge levels about NIPT before conception. This revealed important information about the awareness and understanding of NIPT in the general population, which is crucial for healthcare providers and policymakers aiming to improve prenatal care. Therefore, focusing on this group can significantly contribute to understanding how NIPT is integrated into prenatal care plans and how it is perceived by those at the very outset of their pregnancy journey.

Advancements in NIPT directly impact Audience 2 (*n*=14) with (*n*=5) in the first trimester and (*n*=9) in the second/third trimester, as they are the primary beneficiaries of these technologies. Their experiences and perceptions can provide valuable insights into the effectiveness, accessibility, and emotional impact of these tests. In most interviews, those who were pregnant had already made the decision to test or not test for genetic anomalies, and this provided context for those experiences. To gain a comprehensive understanding, I recognized

that perspectives could evolve significantly throughout the pregnancy journey. For instance, those earlier in their pregnancy often expressed heightened anxiety and uncertainty surrounding potential genetic anomalies, making their initial considerations and decisions regarding NIPT particularly relevant. Furthermore, understanding the perspectives of those who chose to undergo testing versus those who opted out provided crucial context regarding the factors influencing their decisions, including access to information, perceived risks and benefits, and personal values. By centering the voices of pregnant individuals, I aimed to capture the nuanced realities of navigating NIPT, informing not only future research but also the development of more supportive and informative promotional materials and patient resources. Their diverse experiences – from initial anxieties to post-partum reflections – are essential for ensuring that NIPT advancements are truly serving the needs and well-being of those who utilize them.

Lastly, Audience 3 (n=8) included women who have been recently pregnant which allowed for a comprehensive, but reflective understanding of the testing process soon after pregnancy. This diversity ensured a more holistic view of how NIPT is utilized and perceived throughout the perinatal continuum. Individuals who had recently given birth could reflect on their NIPT experience with the benefit of hindsight, offering insights into the actual outcomes and emotional resonance of the testing process. Additionally, considering women who may already have other children adds another dimension to the study. It allows for the exploration of how previous pregnancy experiences and existing family dynamics influence decision-making and attitudes towards NIPT. This group's diverse experiences and perspectives make them an ideal audience to study, providing a rich source of data that can inform both the medical community and expectant families about the nuances and implications of non-invasive prenatal testing.

I put flyers up in birthing centers, acupuncture offices, coffee shops, dog parks, restaurants, lifestyle shops, and LinkedIn to ensure a diverse sample, reflecting a range of socioeconomic, cultural, and personal backgrounds. Due to the more restrictive privacy guidelines of other social media platforms like Reddit, I decided to avoid recruitment on other platforms. Ultimately, the physical flyers attracted the most interest in my study. These techniques enriched the study by providing a wide array of viewpoints and experiences, making the research findings more comprehensive and applicable to a broader and more diverse audience.

When comparing data from the three audiences – considering pregnancy, pregnant women (first-third trimester) and recently pregnant (within 6 months) - there are several areas where the data both differed and shared similarities.

Differences

Women in their late stages of pregnancy or who have recently been pregnant had more knowledge and experience with prenatal care, including NIPT. In contrast, those considering pregnancy may had less direct experience and had never heard of NIPT. Audiences 2 and 3 had more defined opinions about NIPT based on their experiences, whereas those considering pregnancy had more uncertain and evolving perceptions that inspired them to do more research on their own. Women in the late stages of pregnancy had already made decisions about NIPT and other prenatal tests, in which they were able to provide retrospective insights. Conversely, those early in pregnancy or considering NIPT were still in the process of making these decisions, offering a prospective viewpoint. The emotional responses to NIPT did differ. For those in the first trimester of pregnancy, NIPT was a source of anxiety as they were still new to pregnancy

and unsure of test results. However, those in the later stages reflected on their emotional journey more clearly since they encountered the test more recently, but already received the results.

Similarities

All groups shared some level of awareness about NIPT, as it is a relevant topic for anyone in the pregnancy spectrum. Audiences 1, 2 and 3 all interacted with healthcare providers regarding pregnancy or sexual health, offering insights into how NIPT information is communicated and understood in these settings. Similar cultural, societal, and familial factors influence attitudes and decisions about NIPT in both groups, highlighting broader trends and beliefs about prenatal care. The influence of external resources such as social media, birthing centers, and other educational materials on their understanding and perception of NIPT were also a common factor for all groups.

By analyzing both the differences and similarities in the data from these three groups, I developed a more comprehensive understanding of the perceptions, attitudes, and experiences surrounding NIPT enriching the overall quality and depth of the research in my dissertation.

Recruitment

For participant recruitment, I employed a combination of traditional methods and modern techniques to ensure a diverse pool of individuals. One of the primary strategies I used was posting flyers locally in key locations. Locally, I strategically placed flyers where potential participants would likely see them, such as community centers, dog parks, coffee shops, and health clinics. Additionally, I leveraged my network by asking friends and acquaintances around the country to help distribute flyers in their respective areas. This approach allowed me to reach

individuals from different regions, ensuring geographical diversity and increasing the chances of connecting with potential participants who met the study's criteria.

In addition to the flyer distribution, I also shared a version of the flyer on my LinkedIn page, targeting my professional network. This helped to extend the reach beyond local communities, particularly within my network of healthcare professionals, researchers, and other individuals who could either participate in the study or recommend others. The LinkedIn post was a good way to tap into a more professional demographic and provide a convenient method for potential participants to access the study information and sign up.

Furthermore, I utilized snowball sampling, which proved to be an effective strategy for recruiting participants. After engaging with initial participants, many of them recommended friends, colleagues, or acquaintances who might also be interested in taking part. This method allowed me to tap into networks that I might not have had direct access to otherwise. Snowball sampling helped me not only increase the number of participants but also ensure a more varied sample, as individuals referred people from different backgrounds and professions. Together, these recruitment methods helped me build a robust and diverse participant pool, essential for understanding the study topic comprehensively.

I recruited nationally to expand the reach of my work and collect a variety of data that spans beyond Oregon. I did this primarily by posting physical flyers in community spaces in several different cities. All participants received a $25 Amazon gift card in payment of their time for each interview, provided by my advisor’s research funds. Amazon gift cards were easily distributed virtually, which eliminated any issues for participants outside of Oregon.

Attention to Diversity, Equity, & Inclusion

To achieve diversity in my study in terms of interview respondents and recruitment, focusing on socioeconomic status (SES), race/ethnicity, and maternal health literacy/education, I implemented several strategies:

Varied Recruitment Locations & Screening: I recruited participants from various locations to capture a diverse demographic. The flyers were posted in public and private healthcare facilities, community centers, religious institutions, and on LinkedIn. I ensured that these locations catered to different socioeconomic and ethnic groups. I was mindful of access and opportunity by paying attention to my sample and not simply moving forward with anyone who said yes. Instead, I actively sought to include participants from varied educational backgrounds and SES. I did this by screening potential participants based on these criteria through an initial survey.

Health Literacy Considerations: I used one flyer (Appendix C) throughout the recruitment phase but was conscientious about my language to ensure that the general consumer easily understood them. I used clear, non-technical language in my recruitment materials and during the consent process. I also utilized general design standards to ensure that my flyer was easy to read, attracted viewers, was aesthetically relevant and stood out in different spaces.

Snowball Sampling: I utilized snowball sampling, where existing study participants referred others from their social networks. This helped reach a wider array of participants, especially those who might be less likely to respond to traditional recruitment methods.

Feedback and Pilot Testing: Before finalizing recruitment strategies, I tested my questions on my cousin, who is a midwife. She gave me valuable feedback that informed my interview strategy and helped me develop more questions geared towards individuals representing different demographics to test my approach to ensure it resonates with diverse groups.

Ethical Considerations and Sensitivity Training: I have participated in sensitivity training and am well-versed in these strategies to ensure ethical considerations are in place, especially when dealing with sensitive topics that came up throughout the interviews.

Promotional Material Selection

Background

A separate pre-dissertation thematic analysis was conducted to understand key themes in NIPT advertising that could be further explored in interviews and to aid in selecting NIPT ads for this dissertation (Denneny, 2024). The original analysis utilized deductive codes generated by examining current literature on women's reproductive health, motherhood, and parenting. The deductive codes also stem from discourses seen in the media and found within advertising of women's health products. Each passage was tagged for individual elements first and then reevaluated, eliminated, or combined to interpret how each tag or code represented broader themes or patterns. The analysis found four significant themes amongst every NIPT website: *Affirmation & Superiority, Scientific Jargon & Decision-Making, Access & Empowerment, and Motherhood & Community*. The themes are listed in order of frequency, and all ten websites relied most heavily on comforting language concerning the use of their product. When considering language, disclaimers on each website were analyzed. Generally, websites mention

small or no risk, especially regarding the *"simple blood test,"* which is a less invasive procedure first to detect chromosomal anomalies. While this test can provide valuable data for family planning, the website language generalizes serious medical information that can impact different women differently. Some sites like Invitae and Illumina better communicated the meaning of false positive or positive results and provided commentary like *"decisions about pregnancy should not be made based on test results only*" and *"please make an appointment with a genetic counselor to understand results."* While these are essential instances of support for pregnant women, this study illuminates' ways in which the language and signs used within digital media to portray crucial medical information can be inequitable. It does not consider the severe emotional stress that often comes with being a parent, especially in the case of a positive test result.

In the second portion of the analysis, I focused primarily on images in the advertisements and constructed another set of deductive codes in coordination with discourses of women and how the "ideal woman" is portrayed in media. It was essential to demonstrate a holistic snapshot of how NIPT websites can create unrealistic expectations and perpetuate discourses around "perfect motherhood." The images on each website can be decoded to represent meaning based on individual experiences, which may be harmful or inaccurate. Through the analysis, most images fell into stereotypes and norms of "perfect motherhood" or relied on the "trustworthiness" of professionals within the field. The central themes of this analysis are listed in order of prevalence: *Images of Doctors & Chromosomal Anomalies, Women & Lifestyle, and Website Design.* The images amongst all ten websites send the homogenous message that this product is for wealthy women, conventionally attractive and partnered in a heterosexual relationship, and that the complicated science behind the process is "no big deal."

Dissertation Focus

The previous analysis laid the groundwork for future studies involving this topic and provided valuable overarching context for the next steps involving interviews with consumers of NIPT. While the previous data influences this project, my dissertation focuses on a different set of promotional materials from NIPT providers for a few reasons: 1) The preliminary study pre-dissertation was completed over a year ago, and I would like my dissertation to be as relevant as possible. 2) Similarly, this is a fast-paced and quickly changing industry, resulting in drastically updated and changed provider websites, making it difficult to show static advertisements. 3) It is important that consumers look at the promotional materials in real-time themselves instead of a screenshot to mimic any exploration that would take place on their own time more closely, which results in more accurate data. I chose 4 of the top suppliers of NIPT for this study as doctors in the United States most recommend them and are on the first page of web searches under "NIPT Tests." Each company approaches NIPT slightly differently, as NIPT is not yet readily accessible at home. While pregnant people cannot yet take their own blood tests at home, most commonly, consumers can order and have them taken by local lab services and sent directly to NIPT providers for results, circumventing conversations with primary care doctors and genetic counselors and receiving results through their own virtual portal.

In interviews, respondents viewed selected promotional materials from LabCorp, Myriad, Roche, Natera, and Invitae that include a brochure, a website, a discussion guide, test ordering, and patient resources. Most major NIPT brands do not participate in traditional advertising like through social media, on TV or radio, etc. for these products. Instead, information is typically found online and in doctor's offices by word of mouth or in brochures. Since patients are not

required to access these tests through a physician, it is important to understand the process or ordering a test and analyzing results with only information provided by the materials on brand websites.

LabCorp: A consumer can create a patient profile, make an appointment, order a lab, receive results, and pay bills online. The interviewees spent 1 minute looking at the website and learning about how to order a test on their own and what it would entail.

Myriad (Prequel): A consumer cannot access the test directly without the help of a provider, but there is access to a brochure that explains how a patient can order a lab and have results sent directly to Myriad for testing, and results are sent from their lab. The interviewees spent 1 minute reviewing the brochure to learn more about the test and testing process.

Roche (Harmony): A consumer is directed to ask a pregnancy care provider for this test and provides an "Expecting Parents Discussion Guide" for ideas of questions to ask a doctor about the Harmony test. The interviewees reviewed this guide and main web page for 1 minute to learn how to talk to their doctors about the test.

Natera (Panorama): A consumer can schedule a blood draw near their zip code and send test results directly to the brand for results. Interviewees explored the "patient resources" page to learn about the test and ordering process for 1 minute.

Invitae: A consumer can visit the test ordering page that offers an at-home genetic carrier screening test. Participants looked at this page for 1 minute and spoke about their initial opinions about having access to NIPT directly and not through a health practitioner.

Pre-Test

To refine the interview process for my study, I conducted a pre-test with a midwife cousin who provided invaluable feedback on the clarity and relevance of the interview questions. Given her background in healthcare and familiarity with the subjects I intended to explore, she was an ideal candidate for this practice run. Her insights highlighted areas where the phrasing of questions could be more precise or where certain terms may require further explanation to ensure respondents fully understood the intent. This feedback was instrumental in helping me revise questions to improve their clarity and focus, making them more accessible and relevant to the target participants.

The pre-test also allowed me to assess the flow of the interview. Some of the questions seemed out of order, potentially disrupting the natural progression of the conversation. Based on the feedback, I adjusted the sequencing to ensure a logical, engaging structure that encouraged more thoughtful responses. Moreover, this exercise helped me align the interview more closely with the study's objectives, ensuring that each question addressed key research goals without diverging into tangential areas.

Beyond the structural improvements, the pre-test was also a chance for me to familiarize myself with the interview format and process. Conducting the mock interview allowed me to practice active listening, adapt to interviewee responses, and manage the pacing of the conversation. It gave me the opportunity to refine my interview technique and build confidence

in my ability to navigate the flow of a real interview. This preparatory step was crucial in ensuring that I would be well-prepared and comfortable when conducting interviews for the actual study, resulting in more reliable and insightful data collection.

Ethical Considerations & Security Precautions

Due to the current political rhetoric around abortion rights in the U.S., it is vital to protect the participants involved in my study appropriately. Even though abortion and access to abortion are not the focus of my dissertation, women may have engaged in a termination of pregnancy due to a positive NIPT result, had been restricted in doing so because of changing laws within reproductive healthcare, or have considered abortion in general. This component is complicated, but as a researcher, it is my duty to protect all people involved. I anonymized all interviewees and their families, using alternate names and first names only. I also password-protected all files on my computer and phone of conversations with women in the recruitment process, transcribing the interviews, and writing the analysis.

I created a new Gmail account dedicated solely to connecting with women in the recruitment and interview process, which was an additional level of security to protect information and avoid any accidental miscommunication in either my personal email account or my University of Oregon account. This email was the only contact point for all recruitment and communication materials.

In the recruitment process, I was clear about my intentions and stated any potential complications I could foresee to ensure that all respondents were comfortable. When a person responded to a request for an interview, I disseminated a quick survey/interest form to solidify their interest further, collect generic demographic information, and use that survey as an

opportunity to communicate any potentially uncomfortable topics that may arise. I clarified that all interviewees could opt out during our correspondence. The survey was also an opportunity for participants to self-identify or self-categorize whether they are in a state where abortion restriction is present. This will allow me to increase precaution in conversations with those who may feel unsafe speaking about abortion due to restrictions in their state.

Before each interview, I stated the purpose of the interview and read a disclaimer that states, “There is the potential that our conversation may lead to sensitive topics like abortion, disabilities, and other potentially uncomfortable points. If you do not wish to answer or speak to these or any experiences, you have the right to end the interview by skipping questions”. The start of the interview will also be an opportunity in general to gain verbal consent from each participant.

Ethical considerations were central to the design and execution of this study, and several steps were taken to ensure participants' rights and well-being were protected throughout the research process. Ethical approval was obtained from the institutional review board, ensuring that the study adhered to established guidelines for research involving human subjects. Before participating in the interviews, all participants provided informed consent, which outlined the purpose of the study, the voluntary nature of participation, and the steps taken to protect their privacy and confidentiality. Participants were fully informed about the study procedures and assured that they could withdraw at any time without penalty.

Confidentiality and privacy were of utmost importance in the study. To protect participants' identities, pseudonyms were assigned, and all data was securely stored in password-protected files. The data was also anonymized to ensure that no personally identifiable information could be linked to the responses provided during the interviews. Efforts were made

to minimize any potential distress by creating a supportive and respectful interview environment. Participants were given the option to skip questions or discontinue the interview at any point, ensuring they felt comfortable and in control of their participation.

Regarding the study's specific content, I took additional measures to address ethical concerns related to the sensitive nature of the subject matter. For example, I did not discuss NIPT before showing the promotional materials, ensuring that prior discussions or expectations did not influence participants' responses to the ads. To further mimic real-life experiences, I asked participants to pull up the corresponding links for the promotional materials, just as they might find them through a Google search. This approach helped maintain a more natural, unaltered interaction with the materials.

Throughout the interview, I made sure to clearly state that I am not a doctor and that I would not confirm or deny any medical reactions or interpretations related to the promotional materials. This distinction helped to alleviate any potential confusion or concerns about my role, ensuring that participants did not expect medical advice or expertise during the interview. Additionally, my approach to guiding participants' attention to specific parts of the promotional materials was loosely structured, allowing them to focus on the aspects they found most relevant or impactful while still providing the necessary direction to explore key themes. By maintaining these ethical safeguards, I aimed to create a respectful, transparent, and supportive environment for participants, ensuring their rights and well-being were prioritized throughout the study.

Data Collection

For the data collection phase, I conducted semi-structured interviews, which provided a flexible framework for exploring participants' experiences and perspectives in depth. Each interview

lasted approximately one hour, allowing enough time for rich, detailed responses while ensuring participants did not feel rushed. Prior to starting, I obtained informed consent from all participants, ensuring they understood the purpose of the interview, the voluntary nature of participation, and the use of audio recording for transcription purposes. The interviews were audio-recorded to ensure accurate capture of participants' responses, and the recordings were securely stored to maintain confidentiality.

The interview process was guided by open-ended questions, designed to elicit personal stories and insights related to the study's focus. While a flexible guide provided structure, the semi-structured nature of the interviews allowed for spontaneous follow-up questions, enabling deeper exploration of emerging themes.

One key component of the interviews involved showing participants five different promotional materials related to the subject of the study (Appendix D). These materials were carefully selected to represent various promotional styles, messaging, and visual approaches. I asked participants to respond to each material, reflecting on their impressions and how they might influence their attitudes or decisions. This exercise allowed for a focused discussion on participants' perceptions of these materials in the context of their own experiences.

In addition to the guided questions and promotional material analysis, I took notes during and then reflexive notes immediately following each interview. These notes allowed me to capture any immediate impressions or analytic insights that arose during the conversation. Reflexivity was important in the data collection process, as it helped me to remain aware of my own biases and assumptions while also providing a space to reflect on the nuances of each interview. The combination of audio recordings, open-ended questions, and reflexive notes

ensured a comprehensive and flexible approach to data collection, facilitating a deeper and more nuanced data set.

Measures Taken to Enhance Validity & Reliability

Several strategies were employed throughout the research process to enhance the validity and reliability of this study. One crucial measure was using a clear, focused interview guide aligned with the research objectives. The semi-structured interview format allowed for flexibility, enabling participants to share their experiences in their own words. By asking open-ended questions, the study ensured that participants could provide detailed responses, which helped capture the richness of their perspectives and reduced the likelihood of researcher bias influencing their answers. The interview guide was tested in a pre-test with a participant to refine the questions and ensure they were both clear and relevant.

To ensure the validity of the findings, I also relied on triangulation by collecting data from multiple participants with diverse perspectives. This helped to cross-check the consistency and breadth of the responses, strengthening the credibility of the study's conclusions. By involving a range of participants, I could capture various experiences and viewpoints, thus enhancing the study's external validity. Additionally, by asking participants to respond to the same set of questions, I ensured consistency in the data collection process, allowing for more reliable comparisons across interviews.

Regarding reliability, I followed a systematic and structured approach to data collection and analysis. All interviews were conducted using a standardized procedure, ensuring that each participant had a similar experience, and that data collection was consistent across the study. I also maintained clear and detailed records of the coding and theme development process, which

allowed for transparency in how conclusions were drawn from the data. This audit trail provided a clear, documented process for how the analysis was conducted and helped support the reliability of the study's findings.

Finally, reflexivity was an important component in addressing both validity and reliability. Throughout the study, I reflected on my own positionality and how my experiences, assumptions, and biases may have influenced the research process. This ongoing self-awareness allowed me to critically examine how my interpretations of the data might be shaped by my personal views, ensuring that I remained objective in my analysis. By documenting these reflections, I aimed to maintain transparency in my decision-making process and reduce the influence of potential biases on the study's results.

Limitations

While this study offers valuable insights, it is important to acknowledge limitations that may affect the interpretation and generalizability of the findings. One significant limitation is the use of Zoom for conducting the interviews. Although virtual interviews provided convenience and access to a broader pool of participants, the virtual nature of the interactions may have impacted the depth of participants' disclosures. Non-verbal cues, such as body language and facial expressions, were limited or absent, which could have influenced the richness of the data collected. Additionally, some participants may have felt less comfortable or open in a virtual setting, which may have affected the candor and depth of their responses.

Another limitation is the sample's demographic composition. While efforts were made to recruit a diverse group of participants, the sample may not fully represent the wide range of experiences across all demographic groups. Factors such as geographic location, socioeconomic

status, and cultural background may have influenced participants' ability or willingness to participate in the study, which could limit the diversity of perspectives included. As a result, the findings may not be easily generalizable to all populations, and caution should be exercised when attempting to apply the results to broader contexts or groups.

Finally, the study's reliance on self-reported data introduces the possibility of recall bias or social desirability effects. Participants were asked to reflect on their past experiences and attitudes, which could lead to inaccuracies in their recollections, particularly if certain events or feelings were forgotten or misremembered. Additionally, participants may have been inclined to provide responses they perceived as socially acceptable or favorable, rather than sharing their true feelings or experiences. These factors could influence the validity of the data, and future research could benefit from incorporating alternative data collection methods, such as observation or objective measures, to complement self-reported data and mitigate these potential biases.

Positionality

As a researcher, my positionality influenced every stage of the study, shaping my approach to data collection, analysis, and interpretation. I am a woman who desires to have children but has not yet had the opportunity to do so, which places me in a unique position of both connection to and distance from the participants.

On the one hand, my personal aspirations for motherhood create a sense of shared experience with those I interviewed—many of whom are women navigating similar emotions, decisions, and challenges related to pregnancy and parenthood. This shared gender identity and desire for children fostered a sense of empathy and rapport with participants, potentially

enhancing the depth of the conversations and the richness of the data. I could also connect with participants on the topics of birth control, sex education, pursuing a career first over children, and the pressures and challenges that come with being a young woman in the U.S.

On the other hand, I do not have any children and have never been pregnant, which sets me apart from some participants in a way that makes me an outsider. While I can relate to the emotional and societal pressures surrounding pregnancy and parenthood, I do not possess the firsthand experience of being a mother. This difference highlighted the importance of being mindful of the boundaries of my understanding, particularly when participants shared personal or deeply emotional experiences. As an outsider, I had to be careful not to assume or impose my desires or interpretations onto the participants' narratives.

My personal and professional background, including my public health and communication work, has also influenced my approach to the study. These experiences have shaped my interest in the ethical and cultural aspects of reproductive health, particularly in relation to how women make decisions about their bodies and families. Throughout the research process, I maintained a reflexive journal to critically examine my assumptions, biases, and interpretations, ensuring I could approach the study with self-awareness and transparency. Reflexivity was not a one-time exercise but an ongoing practice. I sought to balance my connection to participants with the awareness that I was also an outsider. By acknowledging and exploring these dual roles, I aimed to engage with the research process in a way that was both empathetic and ethically responsible.

Summary

This chapter provided a detailed account of the methodology used in the study, including the rationale for a qualitative research design, the research setting, sample, and data collection process. Measures to enhance trustworthiness, address ethical considerations, and account for limitations were discussed, along with a reflection on researcher positionality. Together, these elements contribute to a rigorous and ethically grounded study that seeks to provide meaningful insights into participants' experiences and the broader contexts shaping them.

CHAPTER 5: FINDINGS

Through this study, I found several interesting pieces of information that can influence future research, education, and policy. In this chapter, I walk through the answers to each research question and provide context from all interviews. I chose to divide this chapter into research questions first and then into themes second. Both sections feature anonymized quotes from the 30 women, presented in italics and attributed to pseudonyms for privacy. Ultimately, these findings reveal a striking commonality that transcended the 30 individual conversations.

Answering the Research Questions

RQ1: To what extent, if any, do NIPT promotional materials from large health tech organizations impact decision-making amongst pregnant women?

The first research question (RQ1) explores how promotional materials from large health tech organizations influence decision-making among pregnant women regarding NIPT. Overall,

the findings suggest that promotional materials have less impact on decision-making than conversations with doctors, family, or friends.

However, the materials did elicit trepidation, confusion, and questions among participants. While some women found the materials informational and helpful, others described them as off-putting and narrowly focused. Vanessa found that many of the promotional materials distracted people from some important factors of NIPT:

> *"I think statistics on accuracy are missing. I'm left wondering how many people ultimately get a diagnostic test done after receiving results from the NIPT. I feel like they are almost too worried about selling this product to me that they are missing a lot of pertinent info."*

It was clear to most participants that these materials are sources to sell a product disguised as connecting with prospective mothers, and they picked up on the competitive nature of the brands. The predominant reaction was confusion, indicating that while the promotional materials may play a role in decisions around NIPT, their influence is limited and often secondary to interpersonal interactions. Five out of the thirty participants reported encountering the term "NIPT" for the first time during this study, further supporting the primacy of healthcare professionals in introducing the concept. However, those who had heard about the test previously were not always correct in defining NIPT. Most participants thought the test was used to determine the sex of a fetus early in pregnancy. Only one participant defined NIPT correctly, and she is a nurse practitioner. The other participants danced around the definition, hitting on key buzzwords like "Down syndrome," "genes," and "abnormalities." Still, overall, they missed a lot

of nuances about what the test is, what it offers, and how to interpret results. Others had concerns about the test, like accuracy and necessity, but overall, doctors said it is a "normal step in the prenatal journey."

Interestingly, some women reported curiosity about genetic testing before pregnancy but did not equate this curiosity with NIPT until it was explicitly explained. Many participants made connections once they saw the different promotional materials. In some cases, recently pregnant participants did not remember anything about the test, but the promotional materials flagged memories of conversations with doctors early on in their pregnancies. In these cases, women reflected on their NIPT experience, stating that it felt like a normal part of the pregnancy journey to take the test and felt like they were "checking a box."

When exploring the promotional materials, participants noted certain inequities and expressed frustrations with the reliance on technical jargon and numbers and the lack of accessible resources to ask follow-up questions. Despite these criticisms, the promotional materials did influence decision-making in specific ways, such as determining which test to take. Most participants favored promotional materials in the brochure format, where the headlines were clear, the images were inclusive, and the possible genetic anomalies were explained in detail. However, even with these preferences, the majority ultimately deferred to their doctor's recommendation when selecting a test. Ruth was adamant about seeking further advice from her doctor, even though she found some of the promotional materials helpful:

> *"The Myriad brochure is my favorite. It seems like they stuck with the facts and provided a lot of information that I found less distracting than in other materials. But don't get me wrong, I would still bring it to my doctor to get their opinion."*

Several women also remarked that NIPT promotional materials heightened their awareness or concern about potential genetic issues, influencing their perception of pregnancy-related risks. While some felt the materials overstated risks and induced anxiety, others appreciated the information, finding it reassuring and empowering. Trust in the materials was influenced by perceived credibility, including endorsements by healthcare professionals and transparency in presenting data. Also, participants were more likely to trust brands they had heard of before, like LabCorp, whereas lesser-known brands caused more consideration of the test.

Factors such as cost, insurance coverage, and accessibility highlighted in the materials also shaped participants' decisions about undergoing testing. For example, if the promotional material offered an estimate calculator to determine the cost of a test or a detailed section on insurance options, participants were more interested in taking the test. Three out of the thirty participants would "take the test at any cost" to have peace of mind; the rest were sectioned into those that would take the test if it was affordable $100 - $200 out of pocket, but anything over that cost they would pass, and those that would not take the test no matter what do to personal reasons. The majority of participants fell into the category of "knowing about anomalies and sex early would be great, but not necessary if it was too expensive" category. Grace felt like because her family's insurance did not cover the test, it was not worth it:

> *"We just opted not to do it [take NIPT]. The main reason we didn't take the test is that it's not covered by our insurance. So, like I would have had to pay out of pocket which we*

couldn't swing. But yeah, I mean, that extra information would have definitely been nice, it's always great to have more information."

Furthermore, some participants interpreted the materials as targeting more affluent or tech-savvy audiences, which left others feeling excluded or uncertain about the test's suitability for them. Ethical considerations, or the lack thereof, were also noted. Some women perceived the materials as downplaying issues like false positives and the broader implications of genetic information. Others felt the materials exerted pressure to undergo testing without adequately presenting alternatives.

The language and imagery in the promotional materials evoked a range of emotional reactions, from hope (through positive imagery of happy families) to fear and uncertainty (through stark or clinical language). These emotions, in turn, influenced decision-making. While some participants felt empowered by the portrayal of choice and agency in the materials, others felt overwhelmed by the responsibility placed on them. Importantly, cultural and socioeconomic differences shaped how participants interpreted and experienced the materials. Women who attained advanced degrees, had higher incomes, strong community involvement, and other children found the materials relatable and accessible, while those who were single, had negative experiences with doctors in the past, and from lower socio-economic backgrounds felt alienated or confused by the messaging. These findings emphasize the need for more inclusive and balanced communication in NIPT promotional materials to address diverse audiences and reduce disparities in understanding and access.

RQ2a: Do personal health beliefs and the perceived severity of genetic conditions influence an individual's stage in the Precaution Adoption Process regarding NIPT?

Personal health beliefs and the perceived severity of genetic conditions significantly influence an individual's decision-making process, particularly regarding NIPT. The Precaution Adoption Process Model (PAPM) provides a framework for understanding how individuals adopt health behaviors, progressing through distinct stages. The first stage involves being unaware of the issue. Individuals who lack awareness of NIPT or the genetic conditions it screens for remain in this stage. They may remain uninformed for extended periods if they do not perceive genetic conditions as severe or personally relevant. For example, parents who are disinterested in the test due to religious beliefs. In the second stage, being unengaged by the issue, individuals may become aware of NIPT but not see it as personally relevant. This lack of engagement can stem from beliefs, such as assuming their pregnancy or health is not at risk, which may lead them to perceive genetic conditions as insufficiently severe to justify testing.

As individuals transition to the "deciding about acting" stage, they begin weighing personal health beliefs against perceived risks. Those who view genetic conditions as severe and NIPT as a necessary precaution are more likely to progress to the next stage. For example, one participant had genetic issues in her first pregnancy, leading her to be more likely to take the test for her second pregnancy. Conversely, individuals who believe genetic conditions are unlikely to affect them or perceive their severity as low may decide not to act. These individuals enter the "deciding not to act" stage, often believing that NIPT is unnecessary. In contrast, those who perceive a high severity of genetic conditions or feel strongly about mitigating genetic risks may decide to undergo NIPT, moving into the "deciding to act" stage. Once a decision is made, they test in the "acting" stage. While the "maintenance" stage is less relevant for one-time actions like

NIPT, it could apply to follow-up care or decisions about genetic health for future pregnancies. Judy talked about the balance between having access to more information and the power that comes with it:

> *"I don't think there'd be harm for most people, and knowing that the genetic testing, I think, can be great for people like me who'd like to be prepared. I also think it is kind of sad, because I think I'm sure that a lot of people would use it if they find out something and then they might decide to end the pregnancy, which does make me sad. It does kind of feel like a bad test. I guess my views are changing now."*

Findings revealed two predominant pathways in decision-making about NIPT. The first pathway involved individuals prepared to take the test and open to early termination depending on the anomalies detected. The second pathway consisted of women who had no interest in testing because it would not inform their decision-making about termination, often due to religious or cultural values. Nuances emerged within these pathways, whereas some participants expressed a desire to know about genetic anomalies but were committed to continuing their pregnancies if conditions such as Down syndrome were identified. Most participants fell into one category or the other, and there was not a lot of gray area for them in terms of choosing between taking the test or not. However, a few participants like Rachel, felt like making an informed decision involved NIPT:

> *"I mean, my partner and I haven't had [the conversation], and I don't have a solid answer to this yet. But I know like, for example, Down syndrome, you know, a lot of*

people have different opinions about whether or not to carry that baby to term. And I think that would be helpful information to have. Yeah, so you can make those decisions."

Participants also discussed broader beliefs shaping their decision-making, including perceptions of personal control over health outcomes, fatalism (e.g., "what will be, will be"), and trust in medical technology versus natural processes. These beliefs influenced how participants perceived the seriousness of genetic conditions, which ranged from manageable to life-altering. This perceived seriousness often shaped their movement through the PAPM stages, determining whether they moved toward or away from testing. Ultimately, personal health beliefs and the perceived severity of genetic conditions played critical roles in guiding participants' decisions about NIPT.

RQ2b: In what ways do personal anecdotes and experiences influence individuals' perceptions and understanding of NIPT compared to information from healthcare providers, media, and promotional materials?

Personal anecdotes and experiences significantly shaped participants' perceptions and understanding of NIPT, often influencing their decisions in ways that contrasted with information from healthcare providers, media, and promotional materials. Religion played a role in how some participants approached the decision to undergo NIPT, and discussions about pregnancy frequently began with a shared acknowledgment of limited prior knowledge. Women consistently noted how little they knew about NIPT before pregnancy, underscoring the knowledge gap that often frames decision-making processes. Participants with professional backgrounds in health or related fields, such as therapists and nurses, demonstrated higher health

literacy. They understood technical terms like false positives and negatives and were better equipped to navigate the medical jargon associated with NIPT.

One participant shared a particularly poignant experience of receiving a positive NIPT result indicating a genetic anomaly in her child. She expressed frustration over the lack of nuance in promotional materials and the absence of a strong relationship with her healthcare provider, highlighting the critical role of supportive and informed medical guidance. Factors such as a doctor's influence, community support, and financial considerations emerged as key determinants in participants' NIPT decisions. Willa said experiences during her first pregnancy with her doctor heavily influenced the decisions she made during her current pregnancy:

> *"Yeah, so the more like clinician doctor-based people in my first pregnancy contributed to the fear and anxiety versus the midwives I have now. I mean, they [the doctors] didn't know me, it was like they would just come in and, you know, scan me, rub some jelly on my belly, and then they never saw me again. So, it's like they had no relationship with me.*

Negative personal experiences, such as unexpected results or miscarriages following invasive tests, heightened the perceived risks of NIPT, leading some participants to approach the test with caution or hesitation or discouraging women from pursuing NIPT altogether. First-hand accounts often led them to delay or avoid the test, even when healthcare providers or promotional materials recommended it. Elanor spoke a lot about her personal experience with miscarriage and how that is something people do not often talk about. She focused on how her previous miscarriage impacted her second pregnancy and how the promotional materials lacked nuance in the human experience:

"I think like after having a miscarriage there was like a lot of fears of like, maybe miscarry again. And even like when he like, was finally born. It was like, oh my gosh, he was alive. The brands don't mention anything like that at all."

Conversely, positive experiences, where NIPT provided valuable early information, lowered perceived risks and boosted confidence in the test's accuracy and utility. Personal anecdotes also helped humanize the NIPT process, counterbalancing the impersonal and overly technical tone perceived in media and marketing. Several participants spoke about how NIPT helped them feel more confident and relaxed for the duration of their pregnancies, knowing that the probability of something going wrong was minimal according to the test.

Beyond direct personal experiences, external factors also influenced participants' understanding of NIPT. Healthcare providers were generally regarded as authoritative and trustworthy sources of information, particularly regarding the science and accuracy of NIPT. However, some participants felt that while their providers were knowledgeable, they did not fully address NIPT's emotional or practical aspects, leaving gaps that personal stories often filled. While many participants appreciated the clarity and professionalism of the clinical, fact-based information provided by healthcare professionals, others found it insufficient to understand how the test fit into their broader pregnancy journey or address their emotional responses to the results.

For example, when doctors focused on the technical aspects of NIPT, participants often turned to friends or online forums for insights into the emotional and practical dimensions of the experience. These stories clarified complex concepts such as false positives or the implications

of high-risk results, making statistical probabilities feel more tangible and comprehensible. Many women reported that personal stories from others significantly shaped their choices, especially when these stories illustrated how early detection facilitated planning and preparation for varying pregnancy outcomes. Additionally, they regarded personal stories from trusted individuals as more authentic, which could shift their perceptions of the test's necessity and reliability.

Participants frequently expressed skepticism toward media and promotional materials, viewing them as biased or profit driven. They also reported that media played a significant role in raising general awareness of NIPT but often found it overwhelming and confusing, particularly when conflicting messages about the test's accuracy, risks, and benefits were presented. Sensationalized or fear-driven media coverage about genetic testing exacerbated anxiety and uncertainty for some women. In these cases, personal anecdotes provided reassurance and contextualized the risks in more relatable ways. While promotional materials effectively informed women about NIPT options, personal stories played a more significant role in shaping participants' final decisions.

RQ3a: In what ways do women decode NIPT messages?

The decision to undergo NIPT is often seen as a crucial step in preparing financially, emotionally, and physically for pregnancy. Many women emphasized the desire for peace of mind and being prepared, often citing these as a primary motivator. Some felt a strong responsibility to ensure their baby's health, viewing the test as a parental duty. However, this sense of obligation also created pressure, with some women feeling pushed toward a "one-size-fits-all" model of motherhood. This pressure often led to confusion, more questions, and a lack

of resources or support to navigate the complexities of the test. Skepticism also emerged regarding the intentions of NIPT companies, with concerns about whether doctors received financial incentives to recommend the test.

Women often trusted messages from doctors or genetic counselors, relying on these professionals to help them understand the technical medical language of NIPT. These experts were generally seen as credible and unbiased. In contrast, promotional materials from large health technology companies were often met with suspicion. Many women questioned whether these materials were profit-driven and felt they downplayed risks while focusing disproportionately on benefits. Such skepticism was extreme when these messages ignored the emotional and ethical implications of NIPT and had participants wondering if their doctors were offered financial means for recommending a particular brand of test.

Personal stories shared by other mothers in materials were perceived as more authentic and relatable. Often free from corporate or professional filters, these narratives provided valuable insights for many women. Personal circumstances also shaped how women decoded NIPT messages. For example, older women or those with a family history of genetic conditions viewed NIPT as highly relevant. In contrast, women who perceived themselves at low risk were more likely to see the test as a source of unnecessary anxiety. Messaging highlighting "early detection" and "peace of mind" resonated particularly with women who felt at higher risk, as they viewed the test as practical and necessary.

Conversely, some women interpreted NIPT through an ethical lens, questioning whether the medicalization of pregnancy was necessary or aligned with their values. For these women, NIPT conflicted with their belief in accepting all pregnancy outcomes as they are. Others, however, saw the test as empowering, valuing the knowledge and control it provided over

potential genetic issues. Justine acknowledged that downsides exist, but that is the case for most things. For her, having access to the most information possible was most important:

> *"I think it's a no-brainer; if you can get the same information about your baby from a simple blood test, then I would personally choose to go that route as opposed to other options, especially assuming I will already be undergoing other blood tests. I don't know a whole lot about NIPT, so I would want to consult my doctor in advance of using the test to get a better understanding of the benefits and possible downsides of the test. But for now, count me in. Who doesn't want to feel in control of their health and decisions?"*

Health literacy also influenced how women interpreted NIPT messaging. Women with higher health literacy often found the scientific language clear and factual, while others found it intimidating and sought more straightforward explanations from personal networks or trusted online communities. Similarly, some saw emotionally reassuring language like "peace of mind" or "safe and non-invasive" as comforting, but others viewed it as manipulative or overly simplistic.

Broader health beliefs played a role as well. Women who viewed pregnancy as a natural process were more likely to see NIPT as invasive or unnecessary. In contrast, those who embraced medical technology to improve health outcomes often saw the test as progressive and empowering. Phrases like "knowing as early as possible" were interpreted differently: for some, they symbolized proactive care, while for others, they introduced unwelcome stress.

Women with strong media literacy skills were often critical of how NIPT was framed, recognizing that promotional messages emphasized benefits like non-invasiveness while

minimizing ethical concerns such as selective abortion. Cultural perspectives also shaped interpretations, as women from backgrounds where pregnancy was seen as something not to be interfered with often viewed NIPT as unnecessary, risky, or morally problematic. For example, one woman from Ghana who is residing in Atlanta refused to take NIPT for reasons tied to her unique cultural values.

Finally, the imagery in promotional materials (depicting happy families and healthy babies) elicited mixed responses. For some, these images were reassuring and motivational, reinforcing that NIPT ensured positive outcomes. Justine felt like the promotional materials increased her sense of joy and excitement about the possibility of pregnancy. She said:

> *"The picture of the couple on the front of this pamphlet makes me feel happy for them, they look like they received good news or are celebrating something."*

For others, such imagery felt manipulative, portraying an idealized vision of family life while ignoring the complex realities of pregnancy. This difference in opinion could be attributed to the varying stages within the perinatal continuum. For example, some women, like Justine, who are younger, considering pregnancy and have not yet had experiences like infertility or pregnancy, potentially contributed to her interpretation of the materials. While others within this study were reflecting on their own unique experiences that led to feelings of images portraying a falsified or misleading vision of motherhood and pregnancy.

RQ3b: Is there a difference between how pregnant women decode the messages versus those in early or considering pregnancy?

The analysis of how pregnant women and nonpregnant women decode messages about NIPT reveals distinct patterns shaped by their respective life stages and emotional contexts. Pregnant women tended to interpret these messages with a sense of urgency due to the immediate and tangible implications for their pregnancies. Phrases like "early detection" and "peace of mind" strongly resonated with their active concerns about their unborn child's health. They were more drawn to messaging emphasizing non-invasiveness and low risk, reflecting a desire for certainty in their prenatal decision-making process. These women often balanced inputs from healthcare providers, media, and personal anecdotes, using this diverse information ecosystem to evaluate NIPT materials. Social and cultural pressures surrounding "responsible motherhood" further shaped their interpretations, with many feeling compelled to consider NIPT as part of a proactive approach to pregnancy care. Isabelle always considered NIPT:

> *"I would take the test again without hesitation I knew I had to take it to ensure my baby's health."*

In contrast, nonpregnant women or those in early pregnancy stages decoded NIPT messages in a more abstract, hypothetical manner. Without the immediate pressure of a current pregnancy, they viewed these messages through lenses of curiosity, education, and future planning. They often approached the materials analytically, focusing on broader concerns such as cost, ethics, societal pressures, and professional or lifestyle considerations. Messages emphasizing early detection or urgency were less compelling to this group, as the stakes felt more distant. Nonpregnant women tended to rely more heavily on promotional materials as primary information sources, given their lack of direct engagement with healthcare providers on

this topic. They were generally more skeptical, perceiving the materials more as advertisements than helpful resources. One interesting finding from this group was that all nonpregnant individuals brought up the idea that pregnancy is never officially "taught" and that there is a lack of education around perinatal health in general, and that they are often left to their own devices to seek information and make decisions.

Both groups, however, expressed confusion and anxiety regarding women's health topics, with a shared desire for greater financial transparency and clarity in messaging. Pregnant women brought a more informed perspective to their decoding process due to their engagement with healthcare providers and prior experiences with prenatal care. Meanwhile, nonpregnant women demonstrated a more detached, exploratory approach, reflecting the lack of immediacy in their decision-making. Social and community influences also played a role, with pregnant women particularly attuned to family and societal views on genetic testing, which further shaped their interpretations of NIPT messages.

RQ4a: What are pregnant women's perspectives on language and images used for promoting NIPT products and how does it influence their engagement with the promotional materials?

Pregnant women's views on the language and imagery used in promoting non-invasive NIPT varied, reflecting both emotional and critical responses. Terms like "peace of mind," "early detection," and "low risk" were often perceived as comforting and aligned with the desire for reassurance during pregnancy. However, these exact phrases sometimes evoked skepticism, with some women feeling that such language oversimplified the complexities of prenatal decision-making or heightened their anxiety about potential risks. Amelia asked to pause the interview for

a few minutes because the phrasing about genetic anomalies increased her stress about the possibility of something being wrong. After taking a moment to grab some water, we continued the conversation, and she was ultimately relieved to share more about her feelings and input about how the brand talked about genetic anomalies and the probability of a positive test result. She expressed that the clinical nature of the language and lack of nuance in recognizing a woman's experience had the opposite impact of "being prepared," and, in the end, she felt glad she encountered the promotional materials because it drew her attention to the complications of accessing information online:

> *"Okay, at first, the way they talk about genetic problems and all the numbers and things were hard to understand since they kinda bombard you and almost like make you feel bad if you do have a positive result and put worry into your head. Maybe the test can help me be prepared, but the lack of resources, real women's experiences, and over-emphasis on what could go wrong outweighed that feeling."*

The number one response from participants was that the materials were overly complicated, and they would prefer to talk to a doctor or friend about the test. Some mentioned that they would prefer to "ask Doctor Google" and find out more about the test on websites like *What to Expect* and *Healthline,* as they felt these resources did a better job of explaining the test in a way that was easy to comprehend.

Most participants also had questions about the term "false-positive" and did not fully understand how it relates to the test. In most cases, participants thought the test would give a definitive answer and did not know that it provides probabilities and percentages. Most

participants also noticed the lack of disclaimers within the promotional materials, making them feel less trust in them overall.

Ultimately, participants found the language to be reassuring at first glance, but upon further exploration and reflection, the promotional materials overwhelmingly led to participants feeling confused, anxious, and wrapped up in medical jargon that made it feel challenging to sift through. Knowing this, many were curious about how to read the test. This became particularly troublesome as four participants took the blood test independently and received the results on their phones within an app tied to their prospective testing centers. Madeline's doctor instructed her to get a blood test on her own and send the results directly to the NIPT company. She had no idea why this was the brand the doctor recommended or why it was separated from her pregnancy check-up:

> *"They [the doctor] gave me a box from Natera and they advised I go to the hospital lab, because they said blood has to be drawn and then sent to them. Then they gave me a number from a representative from Natera to call the week before to talk about billing. So yeah, I did that and ended up taking the test at 10 weeks. But it was kind of confusing talking to both my doctor and this random company. I was told by Natera my insurance covered the test and then by the hospital it didn't so I'm still not really clear on that."*

Out of the four participants who received results directly from their phones, two were health professionals, a nurse and a mental health therapist, and the other two were not related to the health field. Two took the Natera test and the other two took Myriad. When asked about interpreting results independently, the two health professionals felt very confident in their ability

to comprehend the results accurately. At the same time, the other two had to call doctors or genetic counselors to understand fully. All four mentioned that the AI chatbot component made them uncomfortable and that they did not trust the information through this resource. All four did admit to having trouble reading the results, but the two healthcare professionals felt the most confident in their interpretation.

Imagery in the promotional materials, such as smiling families or idyllic baby photos, further divided opinions. While some women found these visuals inspiring or emotionally resonant, others felt disconnected, interpreting them as unrealistic and manipulative. Many noted that the materials lacked representation of diverse family structures or experiences, which limited their sense of identification. Overall, women approached the promotional content with a mix of trust and critique, appreciating its intention to provide support while questioning its ability to address the nuanced realities of pregnancy and prenatal testing. Alex observed discrepancies within the promotional materials, noting a lack of specificity and factual inaccuracies. Specifically, the visual representation accompanying the text describing a "10-week test" depicted a pregnant individual exhibiting physiological characteristics indicative of a more advanced gestational stage. This incongruence raised concerns regarding the potential for the materials to promote a particular, and potentially misleading, narrative:

> *"They're kinda missing the nuance and spectrum of pregnancy. I wouldn't say confusing. I'd say it's more like misleading. Because like, I mean, I think their point is like, this person is pregnant. So, they're gonna have this test. But you know, they're very pregnant. And at that point, it's very late in the pregnancy, because they are definitely at least 20*

weeks, if not further along in that picture. So, I'm not sure why they used that picture to talk about results as early as 9 weeks."

Engagement with NIPT promotional materials among participants was strongly influenced by how well they felt represented in the media. Many participants expressed that feeling seen increased their interest and trust in the test. However, a lack of representation often led to feelings of exclusion. This sentiment was particularly pronounced among participants from marginalized racial and ethnic groups who noticed the absence of diverse families in the promotional materials. Noelle felt some discomfort when looking at the promotional materials because she did not see her experience as a single mother represented. She also spoke about her cultural background and differences and how she did not have any family members in America. Furthermore, they stirred up negative feelings about experiencing motherhood on her own:

"These pictures make me nervous. They remind me of my baby's dad, and I don't want to be reminded of him… when the baby came up, he denied responsibility, and I was left with my baby all alone. These pictures all have people around them."

Perceptions of affluence and accessibility also shaped engagement with NIPT media. Participants felt disconnected from materials that predominantly showcased affluent, middle-class families. This often gave the impression that the test was inaccessible to people from lower socioeconomic backgrounds. Cultural representation was another critical factor in shaping engagement. Many participants noted that they were more likely to trust and engage with NIPT media when it reflected their cultural beliefs and practices surrounding pregnancy, health, and

genetics. However, culturally insensitive messaging or imagery that clashed with their beliefs alienated some participants.

Representation of non-traditional family structures also resonated with participants, particularly those in same-sex relationships or non-traditional family units. These participants felt a sense of belonging when they saw families like theirs represented in the media. In contrast, others who did not see their family structure reflected in the materials felt excluded. For example, a lesbian participant noted that all images had male partners, which reinforced the notion that this brand of test did not have her experience in mind. Maeve talked about how the promotional materials focused on a singular narrative – that the happy pregnant women were most likely being supported by a (typically male) partner:

> *"All of these lead us to have the assumption that they're partners, which may or may not be relatable for some people. I think overall, these [the promotional materials] should be conscientious of people who might not be excited about it, or are in different life stages, and it is a really difficult time, like partnerships. I do notice that with each of these pictures, I haven't seen any like rings. So, there isn't that assumption that they're married. But the assumption is that they're a couple, just by their, like, stance in their body language together. So, I guess there maybe more diversity in different types of relationships. The other thing that I've noticed is that both of these are heterosexual couple couples. So, there'd be some more diversity. And just because any person with a uterus can become pregnant, and that can come with a whole variety of different relationship dynamics, as well as just emotionally how you receive that information."*

Age was another noticeable factor among participants as all images featured women that looked to be in their late 20s, early 30s, as claimed by participants. Younger people did not point out age as a factor in the images, but women 35 and older commented about the women in the promotional materials. One participant, a 45-year-old woman struggling with infertility, was particularly upset by the materials as she felt they compounded the idea that she was "too old" for pregnancy.

The portrayal of men in NIPT-related media further impacted engagement. Participants observed that men felt excluded from the decision-making process when they were portrayed as passive or absent, for example, in most images, men would have an arm around a pregnant woman. In contrast, there would just be a woman in images with NIPT or talking to a health care professional. Many participants noted that their partner was a massive component to their informed decision-making during pregnancy and that their opinions were as important as their own.

Ultimately, trust through representation emerged as a key factor in engagement with NIPT media. Participants emphasized that seeing people who resembled them or shared their experiences increased their trust in the information. Conversely, a lack of representation led to disengagement for some participants, who felt that the test and its promotional materials were not designed with their needs in mind.

RQ4b: How do expectant parents engage with promotional materials related to NIPT, and what impact does this have on their understanding and trust in the test?

Expectant parents interacted with NIPT promotional materials in ways that shaped both their comprehension of the test and their trust in it. While some women found the materials

visually appealing or initially informative, many felt they lacked critical details, particularly about the test's accuracy and limitations. This information gap often left them feeling more confused than reassured. Promotional materials, although a readily accessible source of information, were the least trusted compared to input from healthcare providers, family, or social media communities. Women frequently turned to these sources for clarity and validation, with healthcare professionals seen as the most reliable authority. Notably, the second most frequently expressed interest showed a tendency among women to give greater weight to community opinions compared to doctors' advice.

> *"Honestly, I think I would go community one, just because my community is female, and they've like done the damn thing, right. I think there's some kind of like, personal thing there, too, I would probably go my doctor just because he has like a working knowledge. And he's worked with a lot of women and seen a lot of things. And then three, I would go promotional materials. And I probably put that one last, just because I don't know who the advertiser is, like, I don't know who's behind the advertisement. So, it feels less personal. Yeah. But it's like you like to rely on the real-life stories with your friends and people that you trust, because they have kids already. So, like they've been through it. So, they can share, almost like insider knowledge. Whereas ads are like selling us."*

Furthermore, the promotional content's emphasis on the benefits of early detection and peace of mind often created a sense of pressure to undergo testing, leading some women to feel that opting out would reflect poorly on their sense of responsibility as parents. Images of disabilities or scientific jargon in the materials sometimes increased anxiety, reinforcing feelings

of obligation rather than informed choice. For many, social and familial discussions further influenced how they decoded and responded to the materials, either amplifying their concerns or offering alternative perspectives. Ultimately, while NIPT promotional materials played a role in introducing the test, they often raised more questions than answers, prompting women to seek additional guidance and leaving many ambivalent about the trustworthiness of corporate messaging. Lea expressed how the promotional materials seemed to display a dichotomy that confused her even more on the topics of motherhood and being prepared:

> *"But there's like this stigma on both sides, right, like the stigma of disability and the stigma of not wanting to raise a child with a disability."*

RQ5a: What factors contribute to the decision-making process of women regarding whether or not to undergo NIPT, and how does gender play a role in this decision?

Several factors significantly shaped expectant parents' decisions regarding whether to undergo NIPT, with gender playing a nuanced role in this process. Religion emerged as the leading reason for declining the test, as some parents felt it conflicted with their faith and ethical beliefs. On the other hand, the desire to "be prepared" was the most frequently cited motivation for opting in, as many women viewed NIPT as a tool to plan for potential challenges. The decision was also influenced by attitudes toward pregnancy outcomes, with some parents considering NIPT as a step toward making decisions about termination, while others avoided the test because it would not alter their decision to continue the pregnancy regardless of the results.

Additional factors included the perceived ease and safety of NIPT, as well as the opportunity it provided to emotionally and practically prepare for a child with a genetic condition.

However, being prepared did not always mean having the essential tools to raise a child with a genetic anomaly. Instead, more deeply, being prepared *actually* looked like being a perfect parent, protecting the child at any cost, and not showing any cracks on the surface of motherhood. For example, social media played a major role in displaying expectations of being a perfect mom. Participants were simultaneously put off by women sharing their mothering on platforms such as Instagram and idolizing these same women for withstanding the inevitable challenges of being a mother.

Upon deeper conversations with participants, it became clear that actions, thought processes, and attention to gender were at least a part of their stories. Gender came up mostly with women considering pregnancy, as all eight of those participants were pursuing careers or higher education. They spoke a lot about how social media is a major factor in reinforcing norms of motherhood and what women "should" be doing instead of highlighting individual experiences. Lea talked about how she sees the expectations of womanhood play out on some of her social media channels:

> *"Social media is really amplifying the 'tradwife' movement. Like essentially if he's working, I take responsibility for the household and the kids and stuff. I think it's weird, but definitely think even though women are seen as more equal and so they can work these days, they're still expected to do a lot of, or most of the childcare and stuff."*

Gender also influenced decision-making primarily in terms of roles and experiences. While pregnant women generally made the final decision, all partnered participants emphasized the importance of consulting their significant others, highlighting the collaborative nature of these choices within couples. Societal expectations surrounding gender significantly shaped the participant's perspectives and anxieties about parenthood. Many of the women internalized narratives that emphasized their primary role as caregivers and the potential sacrifices associated with motherhood, which influenced their considerations of having a child in the first place. These gendered expectations created anxieties about single parenthood and the perceived loss of personal freedom, particularly in the context of relationship dynamics and the division of labor within a family unit. Ruth illustrated how pervasive gendered anxieties play a role in her relationship and decision-making:

> *"I do worry that my partner could leave me, and I'd be stuck raising a kid on my own. Like, you know, hopefully, my partner wouldn't like leave me when I had a kid but it's like totally like a threat in the back of my mind. You know, totally I relate to that for sure of like, do you want to do this because you have that other person in your life? Would you want to do it without them? Like, that would be really hard. Yeah, like, probably not, you know. All I hear about motherhood is the strenuous aspects of like, you know, pregnancies, ruining your body, like, I can never go out anymore. I can never have fun anymore. Like, I haven't been out to, like, dinner alone in like, three years. Like, I can't go to the bathroom by myself, like, take a shower by myself etc."*

Many participants also wanted to ensure they had enough financial means to care for a child with disabilities, but more so, they talked more generally about the pressure they felt to both reproduce and the expectations that came with motherhood. In this case, participants felt like financial considerations heavily influenced decisions, with some participants stating they would not pursue NIPT if it were not covered by insurance or cost more than $1,000. However, a few participants expressed that peace of mind was invaluable and would justify any expense. Emotional factors such as fear, anxiety, and nervousness were prevalent among those who chose testing, driven by concerns about the emotional burden of being unprepared. A common idea at odds throughout this study was how much participants would be willing to pay for NIPT. In all cases this was tied to how much they would pay for "piece of mind." Some women would pay any cost to have some sense of certainty about their baby's health while others did not consider the financial burden worth an extra data point, especially if they would not terminate their pregnancy anyways. At a deeper level, there was a clear discrepancy in what qualified as "too much money." To participants like Macy, her threshold for "a lot of money" was higher than some other participants. She said:

> *"I'd probably go comfortably without like batting an eye, like up to $1,000. If it's more than $1,000. I'd be like, I really have to kind of think about this."*

Maeve, alternatively, had a much different perspective on what she would be willing to spend:

"$100 bucks is steep honestly. Especially for an illusion of 'being prepared'. Like obviously I want the best for my baby, but I don't think that should come at such a high cost."

In analyzing the participants' perspectives on the financial implications of NIPT, a "doing gender" lens reveals how societal expectations and performances of gender intersect with healthcare decision-making. Macy's willingness to pay a substantial amount, framed by a desire to "reach her full potential as a mother," aligns with societal ideals of proactive maternal responsibility for ensuring a child's well-being, potentially amplified by her higher socioeconomic status. Conversely, Maeve's more cost-conscious approach, considering the expense against the likelihood of terminating the pregnancy, suggests a different enactment of gender, possibly influenced by her profession and a more pragmatic assessment of medical interventions. While both women articulate a desire to provide the "best life possible" for their children, their divergent thresholds for financial investment in NIPT highlight how gendered economic realities and internalized notions of "good motherhood" shape individual valuations and access to reproductive technologies.

The intersection of age and gender was also common among participants, most saliently for women in their 20s who felt consistent pressure to have children. For a significant portion of their lives, health education focused on pregnancy prevention, but as they age, there is sudden pressure and expectations to get married, become pregnant, and have a family. Women in their late 30s and early 40s felt similarly that society told them for so long to avoid pregnancy that when they felt ready, it could be "too late." The older participants were most interested in NIPT

as increased maternal age can be an increased risk for genetic anomalies, adding to the pressure they already feel about time running out.

In contrast, male partners may not face the same level of societal scrutiny or internal conflict regarding the integration of career and family in early adulthood. For example, increased paternal age, while still an increased risk factor, does not have the same timeline as female fertility. Maxine is considering pregnancy and reflecting on the complexities of being a woman in her 20s. She felt her partner, who is male, has fewer expectations, while she is left feeling like she must choose between a child and her career:

> *"It's just hard because, like, the stereotype of like, oh, she wants it all. Like, that's me. Like, that's very true. Like, I want to be able to, like, be there for my kid, like, raise it, give it good memories of like, their parents and stuff, but I also want to hold a higher level of education and have a career aspect that feels fulfilling to me. My boyfriend has never thought about this stuff a day in his life."*

Historically, mothers are primarily responsible for adhering to prescribed parenting practices, and deviations from these norms can lead to social scrutiny. Stigma played a role with some parents feeling pressure to align with medical recommendations or fit traditional parenting norms, even as others leaned toward more natural approaches that rejected such interventions. Three participants decided to have at-home births, which they knew was the right decision for them but felt judged by friends, family, and society in general. It was also common for women to pursue birthing teams that opposed the traditional norms of delivering. Instead of one health practitioner, many had at least three (OBG-YN, a midwife, and a doula). These methods

underscore a desire for agency and control over their own bodies and the birthing process, which was also a key factor in most participant's decisions. The promotional materials also evoked feelings in participants that spoke to the broader societal expectations of gender that are tied to more traditional and nuclear familial norms.

Alex said:

> *"Everything's been very like, oh, like, the mother and the father. Like, here's father's information. Here's the mother's information. And it's like, not everyone identifies as being a father or a mother. Like, there are people who have two mothers or, you know, like, I don't necessarily want to use mother as my title. Like, I'm not opposed to it, but it just has a different meaning to society and indicates very much like, very feminine and woman-centric, which like, okay, yeah, anyone who is pregnant was probably assigned female at birth for sex. But that's not necessarily, what people are identifying as I kind of fall more into the nonbinary realm. So, it's just a little bit annoying that people like that in the industry [NIPT] are just like, oh, like, the mothers carrying the baby. And I'm like, no, there's plenty of trans people who are also carrying babies. Or people who have two mothers, or, you know, it's just, it's tough that they get their marketing so focused on gendered stereotypes."*

Paige also brought up the pressures of being a woman and how gender shapes her opinions of motherhood:

> *"I'm also exploring these pressures we feel as women to have kids in the first place. Seeing how single mothers are still shamed in society. And teenage pregnancies are still*

shamed, and like, the mental dissonance and gymnastics that you have to do to justify that you're essentially like, coercing a woman who is going through her pregnancy. And then she's stigmatized in society, because she's a single mom, she has to work all these jobs, or she's 17. And she has a child…. And it's like, literally a human life. So, you're not only stigmatizing the mother, but the baby too. Then people are like well if you wanted this so badly, what are you going to do to support this child until they're fully grown? And then, like, what programs what financial resources? What emotional resources?"

For many parents, NIPT was seen as one data point among several rather than a decisive factor, complementing other tools and resources in their decision-making process. Previous parenting experiences also influenced choices, with parents of multiple children expressing different perspectives than first-time parents. Past negative encounters with healthcare systems, including traumatic experiences such as miscarriages, further shaped decisions, underscoring how gendered experiences of reproductive health and medical interactions influenced perceptions of the test. Additionally, some participants did bring up the current political challenges related to reproductive choice and how gender is intertwined with those decisions. Hali reflects on how shame and fear can relate to women's decisions:

"I had a friend who got pregnant and when making the decision [to move forward with the pregnancy], she was really intentional, talking with her partner about okay, like financial aid can we get, can we afford this, our stage in our careers? Is this something that we want that we can be so present and intentional with our kids? And the answer was no. And that's how they made decisions. And this is, again, my personal opinion, but

I think the way that women are kind of tucked into that decision now is very fear-based. I think it's disgusting, that if you're trying to change a woman's mind, you're gonna show her an ultrasound, and go from a very fear shame base, because then you're discounting everything this woman has to go through, regardless of the outcome, it's still going to be a very traumatic experience. And now she's lost all support and a lot of trust and healthcare. And so that's my opinion. In a nutshell, I think there should be more education leading up to people getting pregnant, and then education about your options."

RQ5b: How do different communication channels influence the spread of knowledge about NIPT among parents/expectant parents?

Participants highlighted several interconnected themes when discussing how different communication channels influence the spread of knowledge about NIPT. Promotional materials emerged as a limited source of information, but their effectiveness varied. While many participants found links and resources helpful, they noted significant gaps in accessibility and clarity. This highlights how medical jargon, and complex concepts can pose barriers for individuals without healthcare expertise. Professional backgrounds also played a notable role; participants in healthcare professions often reported a better grasp of the information. These insights suggest that while promotional materials provide a foundation, they must address varying levels of health literacy and contextual understanding.

Interpersonal familial relationships were another critical factor in the dissemination of NIPT information. Many participants described the dual role of family members in providing support and exerting pressure. Such dynamics often left individuals torn between differing

opinions, underscoring the influence of familial expectations on decision-making. Similarly, competition among peers or family members occasionally heightened anxiety around making the "right" choice regarding NIPT.

Social media also emerged as a significant communication channel, offering benefits and challenges. Platforms like Reddit, Facebook, Instagram, and podcasts provided a wealth of information and shared experiences, yet this abundance could quickly become overwhelming. The tension between intuition and data-driven decision-making frequently arose, with participants expressing frustration at navigating conflicting advice and discerning what was accurate or applicable to their situation. Justine spoke about how social media could be both helpful and harmful. Her biggest takeaway is that the unhappiest people are typically the loudest:

> *"Like if everything was perfect, then they wouldn't feel the need to go on there and share. So, I need to kind of try to remember that. But when you're in it, like you just want someone to connect with and know what you're going through. But then yeah, you have to self-moderate a little bit. Because you can get sucked in for sure. I mean, there's everything on the internet. Like, it's a scary place. I always knew people had a lot of opinions around pregnancy and childbirth, but like people have a lot of opinions. And some of them are really weird."*

The broader discourse around pregnancy and motherhood in the United States also shaped how participants engaged with NIPT information. Societal pressures to conform to life trajectories, such as having children by a specific age or balancing career and family, created additional stress. Cultural differences further influenced participants' engagement with NIPT, as

some expressed skepticism or resistance rooted in their cultural beliefs about health and pregnancy. These cultural and societal pressures amplified feelings of fear, anxiety, and uncertainty surrounding pregnancy-related decisions. Both societal pressures and familial expectations impact Lea:

> *"There's for sure a pressure in my situation. My boyfriend is like, from a super Asian family, Filipino Japanese, and he came from Hawaii. And there's an expectation for, like a legacy child. So, it would be hard to even, like, sort of convince him about adoption, I think that his family is expecting like a bloodline."*

Healthcare providers, including OB-GYNs and midwives, were consistently identified as the most trusted sources of NIPT information. Participants valued the credibility and personalized nature of advice received from these professionals. However, time constraints in medical appointments often limited the depth of these conversations. As a result, many participants felt compelled to seek supplemental information from other sources, such as online research. This reliance on additional channels often led to frustration, as participants encountered conflicting or incomplete information online. Despite these limitations, interactions with healthcare providers remained the cornerstone of informed decision-making for many, reinforcing the importance of trust and credibility in these relationships. Most participants were also skeptical of genetic counselors, primarily if they are employed by the organizations selling NIPT. There was not a general sense of understanding of who these people are and what their role is within the process. Many participants avoided speaking with a genetic counselor and consulted their OB-GYN or midwife.

In sum, the spread of knowledge about NIPT among parents and expectant parents is shaped by a complex interplay of communication channels. While promotional materials and social media provide valuable starting points, their effectiveness depends on the accessibility and clarity of the information. Interpersonal dynamics, cultural influences, and societal pressures further complicate the decision-making process. However, healthcare providers remain the most reliable and trusted source of information, underscoring the need for patient-centered communication that accommodates diverse needs and contexts.

RQ6: Where do most expecting parents first hear about NIPT (if at all)?

Interestingly, expectant parents in this study learned about NIPT primarily from me or their doctor. Several participants mentioned that they were introduced to NIPT during their conversation with the lead researcher, who provided an overview of the test and its implications. I had a few conversations with women trying to conceive who had not heard of NIPT before this study. We had conversations about women's health education and the value of learning about these different tests before pregnancy to have the opportunity to make the most well-informed decisions. Pregnant women who had not heard of NIPT felt similarly in that they would have liked to learn about the tests before their 10-week appointments when it is typically seen as "routine." That way, they could do more research on their own time and better understand the full nuance of the test. This highlights the role of educational research in raising awareness about emerging health technologies like NIPT. Elanor said:

> *"I had never heard of NIPT until my second appointment, I think. It would have been nice to have some resources ahead of time since it kinda felt like I was expected to just do it. I*

didn't know there were so many different brands too – could I have decided which one I wanted?"

For many participants, the doctor was the primary source of information about NIPT. Doctors, especially OB-GYNs, were mentioned as the first point of contact when introducing the test during routine appointments. This finding emphasizes the role of healthcare providers in initiating conversations about prenatal testing. However, some participants noted that the information provided by doctors was often brief and required further exploration. After hearing about NIPT from these initial sources, most participants turned to Google and consulted friends and family for additional information. Many participants noted that they felt the need to research NIPT further on their own, often using search engines to find articles, studies, and testimonies from others who had gone through the process. Additionally, discussing NIPT with friends and family allowed participants to gain personal insights and hear about others' experiences with the test.

Lastly, social media groups emerged as a less common but still important source of information about NIPT. Participants mentioned joining online communities, such as Facebook groups, pregnancy forums on Reddit, or following Instagram influencers, to learn more about NIPT and hear about others' experiences. Although social media offered a platform for gathering diverse opinions, it was also noted that the information could sometimes be overwhelming or contradictory, leading to some confusion.

In summary, this study reveals that expecting parents primarily hear about NIPT from personal interactions with the lead researcher and healthcare professionals, followed by self-directed research through Google, discussions with friends and family, and, to a lesser extent,

engagement in social media groups. This pattern highlights the multifaceted ways in which expectant parents gather information and underscores the need for clear, reliable sources of information to help them make informed decisions about NIPT.

Themes

Focusing on the realities of women navigating NIPT across the perinatal continuum, this dissertation answers its research questions and illuminates crucial connecting themes. While the participants represented a spectrum of backgrounds, identities, opinions, life stages, and experiences, their shared journeys revealed significant common ground. This study identified six major themes: 1) Personal Perspectives, 2) Navigating Norms, 3) Emotional & Psychological Impacts, 4) Navigating Healthcare Access & Support, 5) Social Networks & Online Communities, and 6) Messaging Matters.

Theme 1: Personal Perspectives –Values & Life Goals

This theme focuses on individual perspectives, exploring how personal values, experiences, and life goals shape decisions related to pregnancy. It highlights how women's identities are intertwined with their aspirations, and how they navigate personal dynamics when making perinatal choices. It focuses on *who* people are and their life experiences (their identities, past experiences, intrinsic values) thus far. Topics like religion (as a core philosophy), negative experiences (related to health and health-related spaces), and careers (putting a family on hold to pursue aspirations) were common topics.

Sub-theme 1.1: Personal Identity and Life Goals

The central theme was the tension between pregnancy and other life goals, such as career ambitions, personal aspirations, and societal expectations. Age played a crucial role in shaping these perspectives, with some participants balancing their desires to achieve professional success or personal growth while navigating societal pressure to become mothers. Many women also spoke about putting family life on hold while they pursued career choices or felt the pressures of both sides of that coin. Judy said to the challenges that came with pursuing a career and the desire to be financially stable before beginning a family:

> *"Yeah, it was a little wild because we were not planning on starting to have kids yet due to our business. We wanted to make sure we were financially stable. We had just purchased a house. The business wasn't cashflow positive. I just started working again to help pay the mortgage because our business isn't making anything at this point. And I had torn my meniscus, and what in print, meniscus surgery, and then they do pregnancy tests before they do anesthesia. And then I found out I was pregnant there, which, so that was kind of like, it was a big adjustment at first, I would say, because I wasn't quite ready. I was like I still wanted to go on a lot more adventures and feel financially smart.*

Paige added:

> *"I don't think that this middle ground is talked about enough. Like we hear about the people who are like single, getting to travel, really living the DINK [dual income, no kids] life. And then you have over here like, the classic 'I felt like I was destined to be a*

mother since I was a little girl' people. So yeah, there's not a lot of people talking about this space of like, I could be happy in both spaces. And I think that's super interesting."

Sub-theme 1.2: Other Past Health Choices & Experiences

Participants' previous health experiences significantly influenced their current pregnancy decisions. Past encounters with medical treatments, outcomes, or healthcare providers shaped their trust in the healthcare system and their openness to new medical options. A positive past healthcare experience, such as receiving excellent care or successful treatment, often led to a greater willingness to opt for similar options in the future. Conversely, negative experiences or poor treatment outcomes led some to approach healthcare decisions cautiously. Additionally, individuals with chronic conditions or complex health histories brought a deeper understanding of their bodies, allowing them to make more informed decisions. These past health experiences shaped their medical choices and emotional and psychological responses to healthcare, influencing their decision-making processes and health behaviors. Lea expressed how her frequent doctor visits since childhood informed some of her feelings about NIPT:

"Since I was a kid, I'd been diagnosed with a chronic disease, so I have seen my fair share of doctors. Even though I have gone through a lot of tests and spent a lot of time in waiting rooms, I'm almost more on edge. It's like I know how bad things can be, so even in my pregnancy, I'm just always waiting for the other shoe to drop."

Bethany reflected on how her family history impacted her decision to undergo NIPT:

"And actually, I just found out both of my parents have cancer. And so, I'm going to do genetic counseling in general, just to go in and see, you know, is there anything that I might be wrong, you know, just having my family history? … But it's just been something at the top of my mind this year in general. How can you know the most data before this next chapter?"

Sub-theme 1.3: Intersectionality of Race, Class, and Cultural Contexts

Race, class, and cultural contexts play a critical role in shaping women's experiences and choices regarding pregnancy. Participants reflected on how these factors intersected with societal expectations about having children. These factors also influenced how women perceived the availability and value of NIPT. Cultural differences, including beliefs about pregnancy and healthcare, affected how participants interpreted health information and made decisions. Climate change was even discussed as a factor in the decision to have children, illustrating the complex intersectionality of personal choice, societal pressure, and environmental concerns. Maxine talked a lot about her fear of pregnancy and how a lot of it tied to how she was raised:

"I didn't grow up with money, so I often felt like an outsider. My parents did their best, but that experience really stayed with me. All my friends are getting pregnant and at my age it's an expectation, but I can barely take care of myself. I'm scared to bring a kid into the world without being financially stable myself."

Theme 2: Navigating Norms - Stigma, Autonomy & Expectations

This theme explores how societal pressures and expectations, such as stigma, judgment, and norms, shape an individual's pregnancy-related decisions. It addresses how women negotiate autonomy in the face of these influences and highlights the intersection of personal choice and external pressures, making it distinct from other personal experience-based themes. These topics focus on external forces that lead to things like stigma, hot-button issues, political stances, societal norms (pressure as a woman, a mom, disabilities, and choice), external judgments about having home births, not taking the test, etc., any decision mothers make.

Sub-theme 2.1: The Social Stigma of Pregnancy Choices and the "One-Size-Fits-All" Approach

Participants expressed the pressure to conform to societal norms around pregnancy, including specific birth plans or parenting choices. Non-traditional choices, such as home births or alternative pregnancy plans, were often stigmatized, leading to feelings of judgment and isolation. This reflects a broader societal tendency to define "appropriate" pregnancy and motherhood behaviors. Women who deviate from these expectations often face scrutiny, which influences their decision-making and experiences of motherhood. Willa talked about her decision to have a home birth as an example and how she faced a lot of scrutiny about that decision:

> *"I felt like I had almost two different identities. I knew I wanted a home birth, but whenever I would say something, people would try to change my mind or, honestly, just really judge me and my decisions. At a point, I knew about all the harassment I would get, so I just kept my mouth shut."*

Sub-theme 2.2: The Role of Gender and Reproductive Autonomy

This examines how gender norms and societal expectations impact women's reproductive autonomy. Participants discussed the pressures they faced to have children, often due to expectations based on gender roles and the perceived necessity to align their reproductive choices with societal ideals. This pressure can be intensified for women who, after spending years trying to avoid pregnancy, now find themselves in a position where societal norms encourage them to start families. Reproductive autonomy is not only shaped by societal expectations but also by personal readiness, career goals, and fertility concerns, particularly when navigating testing like NIPT. Macy spoke a lot about the pressure she feels as a woman to reproduce and how conflicting it can feel being told not to get pregnant for so long and then suddenly feeling like the window is closing fast:

> *"So, my partner and I have been together for 10 years; we've been married for almost one. We recently bought a house with the intention of having more room for our eventual family. And so, I've been kind of talking to my doctor and trying to figure out my timeline because this is all new to me. Because my whole life up until this point, I've been trying to avoid getting pregnant. So now it's weird - trying to do the opposite is weird. But I recently have gotten off birth control, and I feel like as the woman in the relationship, I have to worry more about like there is a countdown for how long I have."*

Many participants felt pressure to fit a certain mold of motherhood and enter pregnancy with a completed checklist. One expectation was being married or in a long-term relationship before

having children. Leilani added that her choice to have a baby on her own made her feel a lot of pressure:

> *"I was worried about how I would manage work and the pregnancy because I am single…The fear of doing this alone is creating the most anxiety."*

Sub-theme 2.3: Religion, Disabilities, and Beliefs

Religion played a significant role in shaping participants' attitudes toward NIPT and their decisions about how to proceed if faced with a positive or false-positive result. For many religious participants, the decision to undergo NIPT was framed by their belief that they would continue with the pregnancy regardless of the test outcomes. These women often viewed the test as unnecessary, feeling that their faith guided their commitment to the pregnancy. This perspective contrasted with those who saw NIPT as an essential tool for preparing for potential challenges, such as raising a child with a disability. The test provided critical information for these women to help them make informed decisions about their health, finances, and emotional readiness. This divide highlights how deeply personal beliefs, including religious values, intersect with healthcare decisions, influencing the decision to undergo testing and how the results are interpreted. It raises ethical questions about responsibility, particularly as women navigate decisions that may impact their children's lives. Alex spoke about her job working with children with disabilities and how that experience influenced her decision to take NIPT:

> *"I work in special education. And I have a pretty diverse caseload as far as developmental or intellectual delay, or disability, and I kind of see that play out at the*

different stages. And so, I think it would be nice to just kind of say, like, let's do this procedure (NIPT), let's see what information it give us. And just kind of make our decision from there. Not that it's a make or break, but just that it's more informed, which I think is really nice. It gives you more data to work with."

Other participants were adamant about taking the test, not as much to be prepared, but to see what may be causing some concerning symptoms during pregnancy. Noelle told me a story about her second pregnancy, where she learned her baby had a severe health condition:

"I was scared because I felt I was going to lose my baby. Because she was diagnosed with some things that I've never experienced or heard about before. I was so scared, like extremely scared. I just had a feeling… I don't know how to explain it, but something was wrong. My doctor told me about NIPT, and so I took the test, and it confirmed that there was a genetic issue. I was scared that I might lose my baby. But I was honestly more scared about her experience growing up disabled. Would people make fun of her or talk to her less because of her intellectual disabilities? But I'm glad I know. I am feeling better lately because I can ask questions and prepare in advance of giving birth."

More religious participants were either not interested in taking the test at all or would take the test for more information, but in both cases, would not terminate a pregnancy or take further action no matter the outcome. Grace expressed her genuine connection to religion, and while the test could be helpful for planning, it was not a required part of her experience:

"I wouldn't have been upset to have that information, of course, to, you know, be more prepared, but the test wasn't a big factor for us because no matter what the genetic results were going be, it wouldn't like change any decision on our part, but it would have been good to know that there were things we could have prepared for you know? My faith is the main reason I don't want to take the test. Religion is important to me, and God has guided me through each pregnancy. Termination would never be an option."

Theme 3: Emotional and Psychological Impacts of Pregnancy & Loss

This theme focuses on the internal emotional distress experienced during pregnancy, including fear, loss, struggles to conceive, and the psychological toll these experiences take. While individual experiences vary, the theme highlights the collective emotional bond many women share through hardship and the challenges of pregnancy. These experiences came up frequently in conversations around NIPT as they are pieces to the perinatal puzzle. Mental health also came up a lot in interviews. This theme is focused more on internal pressure and impact related to mental, emotional, strain, fear, and anxiety.

Sub-theme 3.1: Navigating Miscarriage and Pregnancy Loss

Previous experiences of miscarriage were frequently mentioned by participants and contributed to heightened anxiety around pregnancy. The emotional toll of past losses often shaped current decision-making regarding NIPT, future pregnancies, and expectations of healthcare professionals. These experiences influence how women approach subsequent pregnancies, as they balance the trauma of loss with hope for future outcomes. Franchesca had experience with miscarriages which shaped her mindset around other pregnancy decisions:

"I would say I definitely have anxiety around the early weeks around miscarriage just 'cause my very first pregnancy I miscarried at like 5 weeks, but I think that experience definitely heightened my anxiety for future pregnancies, so I've been pregnant 5 times, but only had the three live births."

Sub-theme 3.2: Infertility, IVF, & Time

For those who conceived through in vitro fertilization (IVF), pregnancy was often experienced through an emotionally charged lens, where NIPT was not just a routine screening but a significant milestone in a long journey of uncertainty and hope. Participants who struggled with infertility described years of waiting, medical interventions, and financial strain leading up to their pregnancies. NIPT became a critical moment of reassurance, but it also introduced new anxieties. Test results redefined timelines and expectations, sometimes adding weeks of uncertainty before making decisions. These narratives highlight the emotional complexities surrounding infertility and time, where the stakes of prenatal decision-making are heightened due to the prior struggles and investments made to reach this point. Rachel is 40 and spoke a lot about how her age and experience with infertility affected her:

"I mean, I think I feel alone in the medical community. They are ready to do IVF before you even walk in the door. You do feel like wait, where is my agency in this? You start to feel like you're not a person and you're just data, if that makes sense. There's so many protocols; if there's this, then there's this, and there's no nuance at all. So, you start to feel a little bit like nonhuman in a way."

Many participants related to the idea that at a certain age, time can feel like it is running out for women. Nikia said:

> *"I just had this conversation with a friend a few days ago about how we're so programmed not to get pregnant, whatever you do like our whole lives. And then you have like this small window of when it's like, expected, right? Like, I don't know if you feel pressure to have kids with age and things like that, but that comes up a lot for me. Yeah, I would say it does for me a lot. I'm 29."*

Bethany agreed with the sentiment that women not only feel external pressure to get pregnant, but the pressure from within doesn't help:

> *"Isn't it so funny? It's like, we're told for so long to prevent pregnancy. And then I feel like the window to we're expected to get pregnant is so short. That's what society tells us, but then my brain really runs with it until I feel like 10 times worse."*

The emotional distress of infertility often led to participants feeling like pregnancy may not be for them. Lea said:

> *"I've always wanted to be a mom. It wasn't until infertility that really just made me step back and examine my life and like, do I really want this?"*

Theme 4: Navigating Healthcare Access and Support: Choices, Barriers, and Needs

This theme explores the external factors influencing participants' healthcare decisions during pregnancy, particularly their interactions with healthcare providers, the choice between doctors, midwives, or a combined approach, and the barriers to access and support. Significant topics include negative health experiences, relationships with doctors and midwives, finances, no nuance in support, and not feeling heard or supported.

Sub-theme 4.1: Healthcare Experiences and the Need for Better Support

Many women reported negative interactions with healthcare providers, often feeling rushed or disconnected during prenatal appointments. These experiences led some to seek alternative or combined care models, such as working with both OB-GYNs and midwives, to address their medical needs and emotional and psychological well-being. A central concern among participants was the clarity and transparency of information provided by healthcare providers, including doctors and midwives. While some participants felt informed about technical terms like "false positive," others, especially those from diverse linguistic or cultural backgrounds, struggled to understand medical jargon, insurance complexities, and the implications of NIPT results. This gap in understanding eroded trust in healthcare professionals and the system, highlighting the need for clear, culturally sensitive, and accessible communication. Participants expressed frustration when healthcare providers did not take the time to discuss the potential emotional and practical consequences of receiving a positive or false-positive result. Many felt that the rushed nature of appointments, combined with the lack of personalized advice, left them feeling alienated and unsure about how to navigate their healthcare choices. Maggie expressed concern about her doctor and how it makes her feel unheard:

"I've been discouraged, and I feel misheard many times within this process. Actually, more like unheard. I feel like they want to know my bloodwork and prescribe treatments, and that's it."

Taylor spoke about her experience going to a fertility clinic early on in her pregnancy journey and how the lack of doctor care did not go unnoticed:

"After the first miscarriage, we went to a fertility clinic, and my goal was to just see what our options were and get a baseline understanding of where I was at and what my needs were with being able to get pregnant. And one of our questions was, can you get us an insight into how to conceive naturally? Like we are googling this shit, we don't know. Are we even finding good information? So, we had an appointment with the doctor, and he did not want to talk about that during the visit for whatever reason, and he said he would send us something via email, and yeah…we never got that."

Blake said she felt rushed during her past doctor's visits and reflected on her experience as a mental health practitioner as to how that could make people feel:

"Yeah, I think that's a huge concern. Even when I think about the doctors I've encountered, it's been so hard to find people who, you know, aren't rushing you out the door. And, you know, really listen to you. And, and that's concerning, especially from a

mental health perspective, like, you know, that's really serious. And to kind of ignore that is really troubling."

Other participants expressed that OB-GYNs did not focus enough on their partners or the family unit, leading them to feel like they were not cared for holistically. Other participants appreciated the individualized focus. Elanor drew a comparison between new and old experiences:

"So, my husband is travelling, and I went to my appointment by myself, and the provider was new to me. And she took an interest in my support system and asked about my husband and what family was close by and who would help us after birth. In contrast, when I had a miscarriage, I went to visit my OB, and she didn't even acknowledge him in the room and then talked about him in the third person, which was so bizarre. Like he's not even half of this experience, it felt like more of a left-brain science experience kind of instead of seeing the actual person in front of you and what matters to them and what their experiences have been."

Subtheme 4.2: Doctor vs. Midwife: Approaches to Pregnancy Care

Participants had varying preferences regarding their prenatal care providers, with some choosing a combined approach, utilizing the expertise of both doctors and midwives. These participants valued the personalized care midwives often provided, particularly during labor and delivery, while also recognizing the medical interventions that doctors could offer in case of complications. Others opted for home births with midwives as their primary support, valuing a low-intervention, more intimate birthing experience. Meanwhile, some participants exclusively

chose doctors and hospitals, emphasizing the perceived safety and medical expertise they felt was necessary for their well-being and the safety of their baby. These differing approaches highlight the range of beliefs, past experiences, and trust in healthcare systems that influence how women navigate pregnancy care. Madeline found merging her OB-GYN with a midwife team suited her best:

> *"Well, I luckily just kind of fell in with a midwife that I very much liked, but like, I feel comfortable with the decisions she's making, and she seems knowledgeable, and it seems in line. So, like, I feel like, if I had a question, I would probably defer to what she advised."*

A couple of women relied completely on Doulas and midwives, excluding all OB-GYN or hospital intervention. Willa expressed how her small support system was all she needed:

> *"Yeah, and it was just very peaceful to just have my husband and a doula and two midwives, and the midwives were very, like, hands-off, and they only, you know, got involved when they needed to."*

Sub-theme 4.3: Financial and Accessibility Barriers to Prenatal Testing

Financial concerns emerged as a significant barrier to accessing prenatal tests like NIPT, with many participants reluctant to pay out-of-pocket costs ranging from $500 to $1000. The lack of insurance coverage for such tests exacerbated the issue, raising concerns about healthcare equity

and the accessibility of critical diagnostic tools. For some, the cost of testing was an insurmountable barrier, while others were willing to pay for the additional information to be better prepared for potential outcomes. This divide underscores broader issues of financial strain and the challenges women face in balancing work, family, and healthcare costs. Maeve talked a lot about the cost of NIPT:

> *"It does depend. I appreciate the insurance that I've been able to have through my work. And with general blood testing that I know of, it would be like a relatively inexpensive cost, like, I don't know, 20 bucks or something like that. But if it were like, oh, this test is very expensive, like over $100 or so out of my own pocket, that would be a more difficult decision, if it ended up being more expensive, it wouldn't be worth it, I guess."*

Theme 5: Social Networks & Online Communities

This theme examines the external forces that shape participants' decision-making during pregnancy, focusing on how both in-person and online social networks impact their experiences. It considers the positive aspects of camaraderie and support, as well as the negative influences of comparison, pressure, and isolation. This theme also explores how family dynamics, cultural expectations, partner relationships, and media narratives shape perceptions of pregnancy, NIPT, and motherhood.

Sub-theme 5.1: Family, Societal Expectations, and Social Media Influence

Family expectations, cultural norms, and social media interactions played a significant role in shaping participants' perceptions of pregnancy. Many felt pressured by family members or

society to conform to a certain timeline for having children, particularly in the context of the limited fertility window. Social media served as both a resource and a source of stress—while offering support and information, it also perpetuated unrealistic portrayals of "perfect" pregnancies and motherhood, contributing to anxiety and confusion. The overwhelming amount of conflicting information online made it challenging for women to determine what was relevant and accurate for their unique situations. Lea talked a lot about how her family dynamics impact her:

> *"Another really big thing is that my sister-in-law is pregnant right now. And it's my little brother, he's three years younger, they just got married in September. They tried for two months and got pregnant. And so, I'm over here like, okay, we've been married for seven years and can't get pregnant. And yeah, that's just made our family dynamic very complicated, like my family is usually a really big support. And it's been hard to feel that support when I've been so angry with my brother and sister-in-law's pregnancy. It's this feeling of like, why them and not us? It adds to the pressure if that makes sense.*

Relationships with mothers were also a significant topic amongst participants, many citing their own mothers as valuable resources for their own mothering. Claire spoke about her trust in familial advice:

> *"The person I trust the most is my mom because she raised me. And we are raising our kids pretty much how my parents raised us, so if I have a question, she is who I trust the most."*

Hali reflected on how her mother's experience encouraged her to take NIPT:

> *"I decided to take the test because of my mom. When she was giving birth to my sibling, she had complications and they both ended up in the ICU. That experience really scared me and made me want to do all I can to prepare as much as possible. I looked online too and read similar stories so it both helped and made me more fearful if that makes sense. It all made me seriously consider NIPT."*

Sub-theme 5.2: Partner Relationships and Decision-Making

The presence of a partner in the pregnancy journey significantly influenced decision-making and emotional support. Participants with partners often experienced shared responsibility and collaboration in making decisions, particularly around NIPT and pregnancy care. This joint decision-making provided reassurance and emotional balance. In contrast, participants who were navigating pregnancy alone, including some in LGBTQ+ communities, reported feeling isolated and burdened by the responsibility of making complex decisions alone. The absence of a partner for collaborative support heightened feelings of anxiety and uncertainty, especially when interpreting test results or making next steps in care. LGBTQ+ participants, particularly, valued inclusivity and recognition of their family structures in healthcare and decision-making, which contributed to a sense of validation. However, those without partners, especially in LGBTQ+ contexts, faced additional layers of societal and healthcare challenges, such as discrimination or a lack of understanding from providers, which further complicated their pregnancy experiences. For example, some participants like Leilani are going through their pregnancies alone:

"These materials don't seem to represent my story since the father of my child won't be a part of this process."

Other participants expressed that friends are important throughout the pregnancy journey. Some have access to large friend communities while others found it challenging to connect with other moms in person. Maeve mentioned her line of work and how finding female companions could be challenging:

"Actually. Most of my friends either don't want to have children or have had surgery to not have children. And yeah, I work with majority men. So, it's hard to find community in that way. And I do work a lot. So having time for community outside of my regular spheres is difficult. So no, unfortunately, no, I would like to, but it's been really difficult for me to find those connections."

Many participants talked about their husbands as pivotal community members to support them during pregnancy. Esme and Paige reflected on their relationships with their husbands:

"And the one person who's always there is my husband. And so, we talk a lot, but I do feel [the pregnancy] is sometimes overwhelming for him. Because we're both learning at the same time."

Especially around decisions related to genetic anomalies:

"It's very much a decision I would make with my husband. Like if there is, a chance of Down syndrome I think he it, you know, just from earlier conversations we have had, he might not be as excited to continue. But I think I'm a little bit more like, alright, we'll make it work and figure out what to do."

Sub-theme 5.3: The Impact of Social Media and Online Communities

Social media and online communities were double-edged swords for many participants. While they provided a sense of connection, many also expressed that the constant influx of idealized portrayals of pregnancy and parenting contributed to stress, anxiety, and confusion. Women often felt pressure to conform to these idealized narratives, which made it difficult to embrace their own, unique experiences. The focus on negative or cautionary pregnancy stories, such as complications or miscarriage, intensified feelings of fear and uncertainty, overshadowing more positive or empowering narratives. Isabelle said:

"I've somewhat been on online forums and those are marginally helpful to me but honestly, sometimes create more anxiety for me, than usefulness, and there's like, just almost sometimes too much information out there. Like, where people will be referencing terms and, you know, abbreviations for things that don't even know what they're talking about. And you can kind of go down that rabbit hole, you know, all these problems, you think you have that maybe you don't have or never existed in your mind and now you're like wait is this a possibility?"

Doomscrolling and going down a rabbit hole were commonalities amongst many of the participants. Macy talked a lot about how social media connection initially was helpful, but the more she engaged the more it affected her mentally:

> *"I try not to use social media a lot honestly, because I tend to overuse it and get really anxious or feeling like I'm missing out or comparing myself to others. I remember one time I asked a question about NIPT on Facebook, and people reacted really negatively so I haven't really been on since then."*

Trust also emerged as a common topic beyond comparison and doomscrolling. Claire spoke about her involvement in online support groups vs. following influencers on Instagram:

> *"I follow a lot of birth stuff on Instagram and joined mom groups on Facebook, but I recently deleted all of them because I hate them. The parenting groups on Facebook are basically you asking a question to a bunch of strangers, and you don't know if you can even trust these people because you don't know who is responding, so I just never even looked at what they had to say about NIPT. I just wasn't even interested in what they were talking about. But the Instagram felt different, and I liked it better. I like pictures and the visual component. The information is also just quick, more like tips from experts like midwives so I prefer that because on forums and groups it's like I don't know these people there's no faces attached, so on Instagram, I can do more fact-checking of like okay is this someone I can trust or are they more unhinged because you can tell."*

Regardless of social media support, most participants agreed that taking any questions they had to friends, family, or medical professionals were most important. Hali talked about balancing information online and real-life perspective:

> *"I do lean on people online. I don't post a lot, but I do read a lot of Reddit forums, and there's a Facebook group I'm a part of with moms of similar dude dates. There's a lot of first-time moms as well as moms with other kids so there's diverse information on there. But honestly, I am more of a reader and want to look up things online or ask my doctor. So, if I see something about NIPT on these forums, I am more likely to bring questions to my in-person community."*

Sub-theme 5.4: Lack of Positivity in Pregnancy Narratives

A prevalent sub-theme among participants was the frustration with the absence of positive pregnancy stories within their social circles and in media. Many felt overwhelmed by cautionary tales of complications and complicated births, which left them feeling anxious and disconnected from their own experiences. This lack of representation of healthy, straightforward pregnancies contributed to feelings of isolation and a diminished sense of confidence in their pregnancy journeys. The absence of empowering narratives reinforced a sense of fear, making it harder for women to approach pregnancy with optimism and self-assurance. Blake spoke about this concept a lot:

"I tried to be informed and not go down these rabbit holes of finding really scary, sad stories, which can be easy to do. I feel like there are way more negative stories out there than positive stories on this topic. I mean, there's so many out there, it freaks me out."

Other participants felt like when they saw negative stories online, they would get wrapped up in them and have a hard time separating their experiences from those online. Madeline said:

"I have tried to moderate how I use social media and be intentional about the information because I feel like my brain tends to prioritize the more negative information. And I can talk myself down like the people posting are probably the people that need the most help, and this isn't the "norm." Like, if everything was perfect, then they wouldn't feel the need to go on there and share. But yeah, I find it hard to separate that sometimes."

The negativity rabbit hole was a commonality amongst participants. Vanessa said:

"It doesn't take much for you to spiral into researching all of the things that can go wrong. And there's so many just like traumatic birth stories and, and stuff out there. So, it's been overall not the most healthy thing, you know? For example, when I read about NIPT, I am scaring myself by reading all of the different things that go wrong. And yeah, you can really go down rabbit holes."

Theme 6: Messaging Matters

This theme examines how NIPT is communicated to consumers through healthcare providers, media, and promotional materials. It explores the clarity, accessibility, and cultural sensitivity of these communications, including the role of trust in healthcare-provider interactions, media coverage, and informed consent. Promotional materials, literacy, trust, informed consent, and technology (apps, AI, etc.) are all major topics within this theme.

Sub-theme 6.1: Information Accessibility and Media Literacy

The accessibility of accurate and reliable information emerged as a recurring concern. While participants actively sought information through books, social media, and online communities, many felt overwhelmed by conflicting messages and a lack of clear guidance in the promotional materials. Participants also voiced a need for media literacy, pointing to the overwhelming and often contradictory information available in online sources. A significant barrier to informed decision-making about NIPT was the quality of communication regarding its potential outcomes and limitations. Many participants misunderstood the scope of the test, assuming it was solely for gender determination. Furthermore, the lack of explanation about informed consent processes and the emotional impact of test results made it difficult for participants to understand the significance of the decision they were making fully. Most confusion was around the option of taking a blood test and sending it directly to a company like LabCorp, circumnavigating a doctor's reading of the results. When asked about NIPT, many participants knew it could tell the sex of a baby at 9 weeks, but many did not know the other capabilities of the test. Katie said:

> *"I am most excited that the test can tell me if I'm having a boy or a girl so early. Like it's really cool that I can know and do all my planning so much sooner."*

Vanessa did not know that the test could also test for genetic anomalies:

> *"I know that it allows people to know the sex of their baby earlier in pregnancy instead of having to wait until the anatomy scan."*

Sub-theme 6.2: Influence of Promotional Materials

Promotional materials also played a critical role in shaping public perceptions of NIPT. Participants noted how promotional materials often emphasized the test's ease and non-invasiveness, but rarely addressed the complexities of interpreting results or the emotional consequences of a false positive.

When asked about the promotional materials, many participants felt excluded. Maeve commented:

> *"It's just something that I look for, just in general, because I am from a mixed background. And it is important to me to have equity and representation in advertisements. And, yeah, the two pictures of couples are very basic. Maybe I'm reading into it, but the one single person on there wasn't white.*

Most participants did not receive targeted ads on NIPT, but one did point out the influx of promotional materials she received once announcing her pregnancy on social media. Debbie said:

"I was getting so many ads it's like Google knows you're pregnant before you even do"

As for the promotional materials shown during the study, overwhelmingly participants preferred the LabCorp or Myriad's materials. Roche and Invitae received the most criticism. Isabelle said:

"Getting the Harmony Test is Easier Than You Might Think" is off-putting to me. It doesn't seem like it's any easier to get testing through them versus the other screening providers. Their webpage was very dull and I think the least informative of all of them."

Justine added:

I do feel a little bit like some of the ads, especially the harmony test, are really trying to "sell" themselves as some miracle tests and the best on the market, which makes me feel a little bit wary. It makes me feel like they're really trying to get my "business."

Sales and technical jargon were the most common reasons for participants to be put off by NIPT materials. In reference to the Invitae sample Katie said:

"Is this for NIPT screening? It's unclear with all the sales jargon. What answers are they getting from the genetic testing, and what tests are actually being done?

The lack of description of false positives and probability was noticeable amongst many participants. Justine said:

"There is no information in that section about false positives, which I think would be good for expectant mothers to know."

Vanessa also found the lack of language around false positives concerning:

There's no information on any of the links about the possibility of these tests producing inaccurate results, which seems shady!

Overwhelmingly, participants, when asked to rank their trust in promotional materials, friends/family, and health practitioners, repeatedly ranked promotional materials as least trustworthy. Macy spoke a lot about how the materials do not connect with her as much:

"I probably put that [promotional materials] last [trust-wise] just because I don't know who the advertiser is. Like, I don't know who's behind the advertisement. So, it feels less personal. I probably rely more on the real-life stories of my friends and people that I trust because they have kids already, and they've been through it. So, they can share, almost like insider knowledge. Whereas ads are like selling us. And it feels like pregnancy, to me, is the one thing that feels very interesting advertisement-wise, because it's like, it's such a personal thing. And I get that certain products work for a lot of people. But yeah, it just feels strange. I don't know, it's not like picking a cereal. I don't know how to describe it. Yeah, well, we're talking about our health, it's definitely, you know, there could be more risks associated with decisions made in that realm versus like getting a cereal that you don't like as much as Froot Loops or whatever."

CHAPTER 6: DISCUSSION

The findings from this study reveal important nuances about the intersection of health, communication, and technology, providing a foundation for understanding how strategic communication can shape perceptions and decisions related to emerging health technologies. Furthermore, this study illuminates other relevant findings pertaining to interpersonal relationships both online and in person and contributes to other valuable conversations within the U.S. and globally.

This chapter situates these findings within the broader academic and practical contexts, explores their implications, and offers pathways for future research and application. Through this dissertation, I aimed to understand more about NIPT and how it is communicated to pregnant women through promotional materials. In my conversations with these women, I also encountered related topics such as genetics, disabilities, gender, relationships, mental health, technology, and social media, all of which tell a unique and relevant story about women's health in the U.S. today.

The first research question (RQ1) explored the extent to which promotional materials from large health tech organizations influence decision-making among women regarding NIPT. The findings suggest that while these materials contribute to awareness, curiosity, and sometimes confusion about NIPT, their role in actual decision-making is secondary to interpersonal influences, such as healthcare providers, family, and friends which aligns with other studies within a health context regarding trust and the internet (Erdhem & Harrison-Walker, 2006). This sentiment also aligns with existing research suggesting that interpersonal interactions are more

influential than media or promotional content in shaping healthcare decisions (Hesse et al., 2005).

The confusion and skepticism reported by participants indicate a disconnect between the intended purpose of promotional materials, to educate and persuade, and how target audiences perceive them. For example, while promotional materials often highlighted the benefits of NIPT, such as early detection of genetic anomalies, participants frequently criticized their reliance on technical jargon, the absence of accessible follow-up resources, and the emphasis on selling a product. This perceived commercialization echoes critiques in health communication literature that marketing approaches can undermine trust and hinder informed decision-making (Thiede, 2005).

Overall, the findings of RQ2a and RQ2b show that personal choice matters. Whether it is the choice to terminate a pregnancy or to not take the test due to religious reasons, choice is fundamental to mothers. Two clear pathways emerged for participants: their willingness to take an NIPT or not to take the test, and whichever they chose was built into the tapestry of who they are, their experiences, and their identities. It was interesting to examine how these fundamental components of who these women are bump up against sociological, political, and economic conversations related to reproductive health. Several studies have explored how religion can impact reproductive and perinatal health from provider perspectives (Gitsels–van der Wal et al., 2014) to patient perspectives (Jesse et al., 2007), all of which highlighting a need for better education around the influence of religion in healthcare decision-making.

According to all participants, education in reproductive and perinatal health was generally lacking. Whether a participant was in the early phases of exploring pregnancy, grieving a miscarriage, exploring options for IVF, in their third trimester, had questions about NIPT, or

recently given birth, one key aspect all women had in common was their acknowledgement that education around these topics was limited, often convoluted, filled with judgement, and hard to access. While some studies have scratched the surface of this topic (Daehn et al., 2022), more work needs to be done to educate women at younger ages about trusted resources for pregnancy and perinatal health as well as provide support for those that are pregnant. It is also important to point out that much of the current NIPT research is centered in European countries and not within a U.S. context, which also ties into political and social factors unique to the U.S. For example, one participant was told that taking NIPT was the "right thing to do" without access to resources; another participant felt like she learned about the frequency of miscarriage too late and did not have access to sources that could help her effectively. Many participants spoke about how women are programmed from a young age to avoid pregnancy at all costs, and then turn a certain age and are expected to become mothers. Much of the research on perinatal health and education is around avoiding teen pregnancy instead of more nuanced approaches to sex and pregnancy for young people. The whiplash feeling came up for most participants during their perinatal journeys and relates to other pressures women inequitably feel.

Conversations around abortion were inevitable during this study as personal choice also refers to the ability to terminate a pregnancy if a genetic anomaly was found. I found that 87% of participants stated that they would terminate a pregnancy if there were positive test results for a genetic anomaly; however, there were nuances in those decisions. All participants, except one, talked about this in the hypothetical, so it is worth mentioning that there is a level of anxiety and stress that was eliminated from these conversations, as many of the participants received "low-risk" test results. However, in most conversations, participants were adamant that having a choice about their pregnancy mattered to them. Most may not choose to terminate a pregnancy,

but if their life or baby's life were in danger, they most likely would. There was a spectrum of responses on what data would go into making this decision, but it is worth noting that choice matters for women within these women. The option to forgo termination was equally important. All women agreed that they appreciated support, understanding, and choice, whatever their decision was. There is limited research on this topic as it is often controversial. Still, some studies have explored how choice related to termination of pregnancy can relate to emotional wellness and satisfaction with care (Heath et al., 2019), and decision-making (Kerns et al., 2012).

Choice also came up in the context of being able to make any parenting decisions regarding a child, mainly when it came to other options that are often judged. For example, a few participants did not want to work with OB-GYNs and preferred to have a team of doulas and midwives. Other mothers chose to give birth at home and avoided hospitals. Others navigated feelings around IVF and miscarriage and questioned their desire to have children at all. One participant felt like her doctor was pressuring her into IVF when she thought she had yet to exhaust her pregnancy options naturally. Cases like these opened the conversation to choose how some participants wanted to explore alternative options, varying resources, and ultimately determine what felt right to them on their perinatal journey. Yuill et al. (2020) confirmed that personalized care and agency are important components of informed choice and decision-making.

Many participants were unaware of NIPT and what it tests for. For example, some women mentioned that they knew the test to be an early way to determine the sex of their baby and were excited about the ability to know in advance of the anatomy scan. This was an interesting finding as the test is routinized in many other countries, meaning it is a required or expected part of prenatal health appointments, and creates more questions about whether or not

NIPT should be mandated or remain optional, both of which can be tied to pressure and stigma. Horn (2022) points out that this concept may be problematic as it reinforces pressure, stigmatization, and discrimination of certain conditions. However, emerging technologies projected to grow significantly in the coming years, with NIPT at the forefront (Market Wide Research Report, 2025), leading to the possibility of increased adoption within prenatal health appointments in the U.S. Other contributing factors to the growth are expansion of testing panels, increased test accuracy, and rising maternal ages. Women are choosing to marry and explore motherhood later in life, attributing these decisions to macro issues like climate change and political unrest and micro issues like financial health, mental wellness, and simply the decision to pursue a career (Zabak et al., 2023).

The materials elicited a range of emotional responses, from curiosity to anxiety. Participants often felt that the materials overstated risks or inadequately explained the complexities of NIPT, such as the implications of false positives or the limitations of genetic information. These findings suggest that health tech organizations may inadvertently amplify uncertainty and stress, particularly for audiences with lower health literacy. This aligns with research highlighting the unintended consequences of fear-based health messaging (Witte & Allen, 2000).

However, the materials also played a role in shaping perceptions of pregnancy-related risks. Participants who trusted the credibility of the materials, often due to endorsements by known brands or healthcare providers, were more likely to consider NIPT as part of their prenatal care. Conversely, lesser-known brands or overtly sales-driven content were met with skepticism, illustrating the importance of perceived authenticity and trust in health communication.

Cultural and socioeconomic factors significantly influenced how participants decoded NIPT messages. Women with higher education levels and incomes reported finding the materials more relatable and accessible, while those from lower socioeconomic backgrounds or with negative healthcare experiences felt alienated. These disparities underscore the need for more inclusive and tailored communication strategies. For instance, incorporating plain language, culturally relevant imagery, and resources for follow-up questions could enhance the accessibility and impact of NIPT promotional materials. While some women interpreted promotional materials differently based on the language and images used, there was an overwhelming connection amongst the participants.

Many participants discussed the importance of their partner or family members in making informed decisions about their pregnancy. There was a lack of materials geared towards a male perspective, LGBTQ+ relationships, and for those who did not have significant others or close family members.

In answering RQ3a and RQ3b, there was a commonality in understanding that communication from powerful entities matters. The women in this study ranged from 1) seeking pregnancy, 2) pregnant (in 1st, 2nd, or 3rd trimesters), or 3) recently pregnant within 6 months. This was an intentional decision to receive data from a range of perinatal experiences and provide perspective on similarities and differences amongst the groups. Perhaps most surprisingly, the sample had more cohesive thoughts than differences. Whether a participant was early on in their pregnancy journey, dealing with infertility, or gave birth in their own home without an OB-GYN present, the gap in how women answered the questions of these stories was aligned in many ways. This finding solidifies that while personal experiences do matter and

contribute to decision-making, there is a connection among women about health and communication as it relates to their pregnancies at a sociological level.

Doctor-patient relationships were the number one response from participants in trust towards NIPT. In most cases, the participant would do their own research and find multiple data points, but almost always rely on what their doctors advised. However, this did lead some women to question doctors' intentions around NIPT. LabCorp (5 times), Myriad (4 times), and Roche (3 times) were the top three tests mentioned by participants. Some wondered how doctors chose the test brands to order, and often, on reflection, did not ask why or had the resources to compare brands. Instead, a doctor would order a test and there was no discussion about alternate brands. One participant blatantly asked if her doctor was getting some sort of financial kick-back for working with a certain brand. Most others were cautious about the connection and while they ultimately trusted their doctors, they did notice a potential ulterior motive and began to question how that could impact them. This relates to concepts of power and how large organizations frame information or communicate, which can influence people and how people in power, like doctors, are often seen as trustworthy. Most participants understood that brands need to sell products to make money, but we had conversations around health care ethics and marketing and how delicate the balance can be.

The historical evolution of health technologies provides valuable insight into the disparities observed in their adoption and accessibility. For instance, the development of NIPT reflects broader patterns of healthcare innovation that have often favored wealthier, predominantly white populations. These patterns echo systemic inequities rooted in historical practices, such as redlining and the unequal distribution of healthcare resources. NIPT's early introduction targeted affluent consumers, emphasizing its novelty and exclusivity, inadvertently perpetuating

disparities in genetic information access. By placing NIPT within this historical context, we can better understand its current role in reinforcing existing inequities in prenatal care.

Concerning RQ4a and RQ4b, there were many relevant findings related to the promotional materials. One significant finding is that women would initially trust the information, but upon further investigation and reflection, they began to question the materials. This is interesting because when thinking about Googling NIPT, for example, people are inundated with information, and the question is, are people understanding what they are consuming, and how can they trust what they are reading when there is an influx of information online? This question also shows a spectrum of trust within the materials where some brands are more trustworthy than others. For example, most participants have heard of LabCorp before for unrelated testing and were more likely to find their brand and promotional materials most reliable.

These questions also brought up ethical concerns like privacy, informed consent, and the potential for misuse of personal data. Criticisms of NIPT are not new, scholars have been concerned about the varying issues related to disabilities, privacy, and access (Bowman-Smart et al., 2018). While limited, there is research on informed consent and misuse of personal data related to NIPT (Piechan et al., 2016, Yang et al., 2022). As technology grows, especially in the health space, people need to understand the unintended consequences that can arise. Results for NIPT are most frequently requested by a doctor, sent to a lab, and then back to the doctor to help interpret results. However, this is not always the case. With more technology capabilities, people can take a blood test and circumvent their provider, getting test results directly to their phones. While less common, it does bring up the issue of interpreting results without a doctor and raises questions about what complications could arise in the near future.

There was also a lack of representation in the promotional materials where both white women and women of color noted a discrepancy in what images were used. The largest complaint was from women of color not relating to the images used. The images primarily used young, white, conventionally attractive women.

In answering RQ5a and RQ5b, there are several factors that contribute to the decision-making process around NIPT, and gender can play a role. Amongst all participants, there was a cohesive desire to be the best parent possible and would put the child first. Fear and anxiety were major themes that instigated NIPT usage. The common idea of being prepared was the number one reason people would take the test. Beyond this reason, there were several nontraditional family stories, a lack of other experiences, and familial and social expectations (cultural and religious) that came into play.

Another interesting finding from this study was that participants relied on online and in-person communities. This opened conversations about how people can get results without a doctor present, the desire for at-home testing, reliance on AI to interpret results, and not understanding the difference between a genetic counselor and a doctor. This also brought up conversations around the pros and cons of community and information seeking online, whether it related to bullying, mis/disinformation, or providing support. This then relates to larger conversations about regulation and laws related to technology, particularly in the health space.

When answering RQ6, I found that most expectant parents hear from doctors about NIPT. However, interestingly, a large subset of participants in both audience groups, pregnant or considering pregnancy, had not heard of NIPT before our interview. While NIPT is a growing resource for pregnant women in the U.S. and globally (Market Research Report, 2025), there is still a gap in education about the test before and during pregnancy.

Practical Implications

This dissertation has several practical implications. In a landscape where rapid technological advancements intersect with complex ethical considerations, this research aims to translate findings into actionable insights that benefit individuals, healthcare providers, and broader societal frameworks. This section delves into the specific ways this study's results can be applied to enhance perinatal health and communication around NIPT.

Health Care Providers

It is clear from this study that relationships between health care providers and patients matter. Many scholars have reiterated that there is a strong link between patient-centered communication and health outcomes (Liu et al., 2023). Still, according to this research, respondents are concerned with long wait times, feeling rushed, unheard, and mis-represented, all of which impact their decisions around NIPT. Those who had negative experiences, ranging from something seemingly minor like a doctor not asking questions to more obvious negative experiences like a traumatic birth, all contributed to participants feeling more fearful, distrustful, and skeptical of health practitioners as it related to NIPT. Transparency of which tests doctors recommend and why could also be helpful to ensure that larger, more powerful entities are not controlling the narrative among NIPT users. Clinics and practitioners could also play a pivotal role in educating patients about the benefits and limitations of emerging health technologies like NIPT and beginning conversations earlier in appointments.

It is also essential to consider different approaches to birthing plans. For example, many women constructed teams of specialists instead of working with a single type of obstetric health

worker. In many cases, midwives, doulas, and OBG-YNs formed teams to help participants throughout their pregnancies, each offering a unique interpersonal and technical skillset. For example, participants expressed midwives typically took their time, got to know them more personally, advocated for them, and considered their health more holistically. Some participants felt they needed an unbiased medical professional to assist with the delivery and testing and be available if more serious complications occurred. One participant expressed how, in her delivery, she was unable to decide about an emergency medical procedure, and her husband was not yet at the hospital. In this case, she entrusted her midwife with advocating for her health and what she would ultimately want. While not a new concept (Marshall et al., 2012), the collaborative effort often receives criticism from those who find the practice "nontraditional" or midwives and doulas "fake doctors" from patients and healthcare professionals alike (Adams & Curtin-Bowen, 2021). The tension between professions can be rooted in power dynamics, and while more doctors are open to collaboration, complexity remains, and it is a consideration for all health practitioners.

Policymakers

These findings suggest that policymakers must impose stricter regulations on health technology marketing, particularly those requiring transparent disclosures about risks, false positives, costs, and other ethical considerations. Scholars have found that increased ethical skepticism can come with increased access (Vanstone et al., 2014). As NIPT continues to evolve globally, U.S. policymakers should understand the varied experiences related to NIPT. This dissertation underscores the significant role of health professionals and women's communities (both online and in-person) in shaping trust, decision-making processes, and education

surrounding NIPT. While these human interactions are primary drivers of consumer understanding and choices, the influence of NIPT promotional materials, though secondary, remains a noteworthy factor. Despite exerting less impact than interactions with healthcare providers and peer networks, these promotional materials cannot be disregarded as they still contribute to consumer perceptions and influence their engagement with NIPT. Additionally, acknowledging that potential hegemonic beliefs are at play within the women's healthcare space would help policymakers develop tools, resources, and regulations that support perinatal health practices. This understanding could inform the creation of resources that challenge dominant narratives and regulations that prevent the perpetuation of harmful biases within the healthcare system.

Furthermore, this research identifies inequities around NIPT and the unintended negative impacts of the test. Women's health research remains limited, and this study shows that there are gaps in the healthcare system. It is clear from this study that there is not a one-size-fits-all answer and that personalized care and experiences matter, as many other scholars are consistently finding (Chawla et al., 2013) This understanding could be reflected in developing ethical frameworks and data privacy protections surrounding NIPT, preventing genetic discrimination, and ensuring informed consent.

Lastly, this dissertation can inform broader policies promoting reproductive autonomy and justice within women's healthcare. Women in this study may not have agreed on policies related to abortion, but they all supported autonomous and informed decision-making. By proactively addressing ethical concerns and safeguarding individual rights, policymakers can advocate for the appropriate use of NIPT and utilize it to empower individuals and respect their autonomy rather than exacerbating existing vulnerabilities or compromising ethics. This

dissertation is not written to take a stance either way but instead to highlight that policy matters to women, at least in this sample, and should reflect policies that empower women to make informed choices about their reproductive health, ensuring that technologies like NIPT serve to enhance, rather than undermine, their autonomy.

Strategic Communication

Additionally, large organizations could adopt more ethical storytelling practices, ensuring that campaigns and promotional materials do not exploit vulnerabilities or perpetuate harmful stereotypes, especially through visual elements (Yan & Hyman, 2021). While some participants found the materials underwhelming or basic, others experienced unease, distrust, and the perception that the content reinforced negative stereotypes, leading them to describe it as alienating or off-putting. Participants noticed in several cases that the images often represented an ideal vision of motherhood and pregnancy. While some photos did feature people from different races/ethnicities, they fell flat in representing varying relationship statuses, personal experiences, and nuance within the perinatal continuum. Even though the fundamental aim of brand promotional materials is ultimately to drive product sales, a more ethical and impactful approach to imagery can be achieved by intentionally considering a more extensive range of diversity, inclusivity, and agency.

Beyond the visual aspect, healthcare technology organizations can empower users to navigate the complexities of this technology with a more comprehensive understanding by prioritizing a clear articulation of NIPT's benefits, limitations, and ethical considerations. Participants had varied experiences with the materials, ranging from finding them helpful to perceiving them as confusing. There were elements in each sample that participants both liked

and disliked. For example, one woman described the Myriad brochure as akin to a "mini biology lesson," highlighting its technical nature while simultaneously appreciating its depth. The main criticism within all materials was the lack of context. For example, terms like “high probability” and “accuracy” left participants craving access to more research or explanation. Similarly, many participants found claims like “the best test on the market” (Myriad, 2025) to be distracting as they seemed more focused on selling than providing helpful information. Ultimately, participants were most curious about the “so, now what?” piece. In hypothetical scenarios that came up in the interviews, participants repeatedly felt like all materials “left them hanging” and lacked disclaimers or resources for connecting with an expert to discuss the next steps.

Moreover, the imperative to promote accessibility underscores the need for communication strategies that resonate with diverse audiences. Utilizing plain language, culturally relevant imagery, and diverse representations can broaden the reach of NIPT information, ensuring that individuals from varied backgrounds can engage with and comprehend the material. Including interactive tools, such as cost calculators and frequently asked questions, further enhances user engagement and empowers individuals to explore and understand NIPT's nuances actively.

Health, Technology, & Communication

The findings illuminate the potential for digital platforms to improve access to NIPT counseling and education, particularly for underserved populations. However, the study also underscores the importance of addressing digital literacy and ensuring that technological advancements do not exacerbate health disparities. This necessitates the development of user-friendly interfaces, multilingual resources, and accessible formats that cater to varying levels of

digital proficiency. Furthermore, providing technical support and alternative, non-digital options remains crucial for equitable access (Wilson et al., 2024). While technology offers promising avenues for disseminating information and resources regarding NIPT, the finding that most participants learned about it directly from their doctors underscores the enduring importance of physical doctor's offices as key sites for providing this information. These in-person spaces remain invaluable for establishing trust, facilitating personalized discussions, and addressing individual questions in a nuanced manner that digital platforms may not fully replicate. Therefore, while leveraging technological advancements to enhance accessibility and convenience is helpful, healthcare systems must continue to recognize and invest in the vital role of physical doctor-patient interactions in the dissemination of information about NIPT.

Furthermore, this research examines the impact of communication strategies on patient understanding and decision-making, highlighting the need for clear, accessible, and culturally sensitive information. By evaluating the effectiveness of different communication modalities, including visual aids and personalized counseling, this work contributes to developing best practices for communicating complex genetic information. More specifically, artificial intelligence (AI) creates both opportunities and challenges in convergence with health (Johnson et al., 2020). Some participants encountered an AI chatbot when receiving their results through an NIPT portal and their experiences with this technology highlighted both its potential for immediate information delivery and its limitations in providing nuanced emotional support or addressing complex individual questions.

Women's & Perinatal Health

This dissertation holds significant practical implications for advancing women's health, particularly within perinatal care, a historically under-researched and underfunded field. The findings contribute to a more nuanced understanding of NIPT, directly informing clinical practice and patient care. This research can empower healthcare providers with the tools necessary for effective and sensitive patient counseling by elucidating the complexities of NIPT utilization and interpretation. This includes the development of strategies to enhance communication regarding complex genetic information, ensuring that women are equipped to make informed decisions about their prenatal care. Moreover, identifying disparities in NIPT access and utilization underscores the critical need for targeted interventions to address inequities and reach underserved populations.

This research also illuminates the psychosocial impact of NIPT, advocating for the integration of mental health support within perinatal care pathways to address the emotional complexities associated with genetic testing. Participants noted the importance of early education about pregnancy and NIPT beyond pregnancy prevention. Women's health advocates, sexual health programmers, and educators should consider a more holistic approach to pregnancy education, including information related to topics many of these participants encountered like fertility, miscarriages, genetic anomalies, and NIPT.

Disabilities Advocacy

By critically examining the utilization and interpretation of NIPT, this research directly contributes to ongoing dialogues surrounding reproductive autonomy and disability rights. The findings illuminate the potential for NIPT to reinforce ableist biases and contribute to the devaluation of individuals with genetic differences. Ultimately, this research highlights the

importance of advocating for accessible and inclusive healthcare systems that comprehensively support individuals and families navigating prenatal diagnoses. By amplifying the voices of disability advocates and individuals with lived experience, this dissertation seeks to challenge the narrative that equates genetic difference with deficit, promoting a more nuanced understanding of disability and advocating for policies that uphold the dignity and rights of all individuals. Ultimately, this research aims to contribute to a future where prenatal genetic testing empowers informed choice rather than perpetuates discriminatory practices, fostering a society that values diversity and inclusion.

Future Research

This study started out by looking at the strategic communication around NIPT and while it is a large part of this work, it has only opened the door to more pathways forward that are understudied and underfunded within the realm of women's health. Upon the completion of this dissertation, future research will unfold along two primary trajectories. Immediately, the focus will be on distilling the core findings into a series of impactful journal articles, ensuring the prompt dissemination of key insights. Beyond this, the long-term vision is to expand this research into a comprehensive book, a project that will necessitate substantial additional data collection. This expanded inquiry will branch into several rich areas: examining the intricate interplay of geographic and political perceptions; dissecting the complexities of health practitioner communication; conducting a deeper dive into the influence of social media; thoroughly exploring the emerging AI component within this field; and broadening the scope to embrace a vital global perspective. Additionally, the research will investigate the often-

overlooked realm of physical advertising and incorporate crucial perspectives from NIPT companies, thereby enriching the breadth and depth of the overall understanding.

Limitations

While this study provides valuable insights into the perceptions and experiences of women regarding NIPT promotional materials, several limitations must be acknowledged to contextualize the findings. Firstly, the study relied on a purposive sample of 30 women from across the United States, representing distinct audience groups: women starting their pregnancy journey, those pregnant in various trimesters, and those recently pregnant. Although this sample allowed for diverse perspectives, it may not fully capture the breadth of experiences and opinions within the broader population of women interacting with NIPT promotional materials. For instance, participants with limited internet access, non-English speakers, or those from historically underrepresented communities might be underrepresented, potentially limiting the generalizability of the findings. Furthermore, while I intentionally recruited participants with diversity, equity, and inclusion in mind, my sample was primarily white, upper middle-class, highly educated, straight, partnered women.

Secondly, using Zoom for interviews was necessary due to logistical and resource constraints, but it introduced potential limitations. Virtual interactions may have constrained participants' comfort or openness in sharing personal and emotional experiences. Additionally, the digital format might have inadvertently excluded individuals unfamiliar with or without access to videoconferencing technology, leading to a sample skewed toward more tech-savvy individuals.

Thirdly, the study utilized four promotional materials as stimuli, chosen to reflect a range of messaging styles and strategies common in NIPT strategic communication. While these samples were carefully selected, they do not encompass the full spectrum of available promotional materials. Participants' reactions to the materials chosen might not fully translate to other marketing content they encounter in real-world settings, like in doctor's offices.

CHAPTER 7: CONCLUSION

While addressing important and timely issues surrounding NIPT and the broader experiences of pregnancy, this dissertation reveals conclusions that messaging matters. Not only can written language in promotional materials shape perceptions, but it can also influence relationships, past experiences, and the identities that make people human. The strength of this research lies in its depth, complexity, and intersectionality, providing a fresh perspective on the challenges women face in navigating perinatal care, women's health, and decision-making.

The exploration of the pressure to parent and reproductive autonomy sheds light on the societal pressures and stigmas that influence women's choices during pregnancy. By focusing on how these pressures impact decision-making around NIPT, the study reveals the complex interplay between individual autonomy and societal expectations, particularly when discussing healthcare provider roles and the lack of accessible resources. It also highlights the intricate balance between upholding reproductive autonomy and adhering to nondiscriminatory disability practices, a central tension explored throughout this dissertation.

The research also underscores the psychological impact of social media and online communities on pregnant women. By examining the mental health effects of these spaces,

particularly in terms of anxiety and competition, the study contributes to an under-explored area in the literature. The focus on how social media influences decisions around pregnancy, NIPT, and motherhood, particularly in terms of anxiety and fear, offers a significant contribution to understanding the evolving landscape of perinatal care. Technology can both make life easier and complicate it, and it is clear from this study that both ring true. As technology becomes more advanced and less regulated, the potential for misuse and unintended consequences increases significantly.

Additionally, the study reveals a critical gap in information and resource accessibility, particularly concerning NIPT. The misconception that it's primarily for determining fetal sex highlights a significant issue of health literacy. The evolving accessibility of at-home NIPT options and testing outside the conventional doctor's office adds another layer of complexity to this issue. By framing this issue through the lens of NIPT, decision-making, and informed consent, the research offers unique insights into how information is disseminated by healthcare providers and how women, especially those with low health literacy, interpret and act on it. In conclusion, the unique lens through which the themes are examined provides a valuable contribution to the understanding of NIPT and the broader experiences of women in the perinatal continuum. The findings of this research underscore the need for a more nuanced and intersectional approach to perinatal care, one that acknowledges the diverse needs and experiences of women. By addressing the identified gaps in information accessibility and challenging societal pressures, healthcare providers and policymakers can work towards creating a more equitable and supportive environment for all women.

REFERENCES

Acker, J. (1990). Hierarchies, jobs, bodies: A theory of gendered organizations. *Gender & Society, 4*(2), 139–158. https://doi.org/10.1177/089124390004002002

Adams, C., & Curtin-Bowen, M. (2021). Countervailing powers in the labor room: The doula–doctor relationship in the United States. *Social Science & Medicine*, *285*, 114296. https://doi.org/10.1016/j.socscimed.2021.114296

Allyse, M., Minear, M. A., Berson, E., Sridhar, S., Rote, M., Hung, A., & Chandrasekharan, S. (2015). Non-invasive prenatal testing: A review of international implementation and challenges. *International Journal of Women's Health*, *7*, 113. https://doi.org/10.2147/IJWH.S67124

American College of Obstetricians & Gynecologists (2025): https://www.acog.org/advocacy/policy-priorities/non-invasive-prenatal-testing/current-acog-guidance

Baker, D.W. (2006). The meaning and the measure of health literacy. *J GEN INTERN MED* **21**, 878–883, https://doi.org/10.1111/j.1525-1497.2006.00540.x

Baldus, M. (2023). "Overestimated technology – underestimated consequences" – reflections on risks, ethical conflicts, and social disparities in the handling of non-invasive prenatal tests (NIPTs). *Medicine, Health Care, and Philosophy*, *26*(2), 271. https://doi.org/10.1007/s11019-023-10143-1

Barnard, M., George, P., Perryman, M. L., & Wolff, L. A. (2017). Human papillomavirus (HPV) vaccine knowledge, attitudes, and uptake in college students: Implications from the Precaution Adoption Process Model. *PLoS ONE*, *12*(8).

Bastian, L. A. (1998). Diagnostic Efficiency of Home Pregnancy Test Kits: A Meta-analysis. *Archives of Family Medicine*, *7*(5), 465–469.

Benoy, M. E., Iruretagoyena, J. I., Birkeland, L. E., & Petty, E. M. (2021). The impact of insurance on equitable access to non-invasive prenatal screening (NIPT): Private insurance may not pay. *Journal of Community Genetics*, *12*(1), 185-197. https://doi.org/10.1007/s12687-020-00498-w

Berger, R. (2015). Now I see it, now I don't: Researcher's position and reflexivity in qualitative research. *Qualitative Research, 15*(2), 219 234. https://doi.org/10.1177/1468794112468475

Bowman-Smart, H., et al. (2018). "Is it better not to know certain things?': views of women who have undergone non-invasive prenatal testing on its possible future applications. *Journal of Media Ethics.* 45(4):231-238.

Boxer, J., Weddell, S., Broomhead, D., Hogg, C., & Johnson, S. (2019). Home pregnancy tests in the hands of the intended user. *Journal of Immunoassay and Immunochemistry*, *40*(6), 642–652.

Beeson, D. (1997). Nuance, Complexity, and Context: Qualitative Methods in Genetic Counseling Research. *Journal of Genetic Counseling*, *6*(1), 21-43. https://doi.org/10.1023/A:1025659701805

Berkman, J. (2011). The Fertility of Scholarship on the History of Reproductive Rights in the United States. *Compass Journal*.

Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE Publications.

Bujnowska-Fedak, M. M., & Węgierek, P. (2020). The impact of online health information on

patient health behaviours and making decisions concerning health. *International Journal of Environmental Research and Public Health*, *17*(3), 880. https://doi.org/10.3390/ijerph17030880

Carbone, L., et al. (2020). Non-Invasive Prenatal Testing: Current Perspectives and Future Challenges. *Genetics and Genomics of Reproductive Medicine*.

Cernat, A. et al. (2019). Facilitating informed choice about non-invasive prenatal testing (NIPT): a systematic review and qualitative meta-synthesis of women's experiences. *BMC Pregnancy and Childbirth*. 19, 27.

Chandrasekharan, S., Minear, M. A., Hung, A., & Allyse, M. A. (2014). Noninvasive Prenatal Testing Goes Global. *Science translational medicine*, *6*(231), 231fs15.

Chawla, N.V., Davis, D.A. Bringing Big Data to Personalized Healthcare: A Patient-Centered Framework. *J GEN INTERN MED* **28** (Suppl 3), 660–665 (2013). https://doi.org/10.1007/s11606-013-2455-8

Cho, I., & Park, J. (2023). The effectiveness of a tailored programme to promote reproductive-health-promoting behaviour in young women based on the Precaution Adoption Process Model: A randomized controlled trial. *Nursing Open*, *10*(3), 1704-1714. https://doi.org/10.1002/nop2.1425

Choi, B. C. (1997). Conducting health research in developing countries: dilemmas in the choice of methodology. Social Science & Medicine, 44(5), 701-710.

Coxon, K., Sandall, J., & Fulop, N. (2013). To what extent are women free to choose where to give birth? How discourses of risk, blame and responsibility influence birthplace decisions. *Health, Risk, & Society*, Volume 16, Issue 1.

Crabbe, R., Stone, P., Filoche, S. (2019). What are women saying about noninvasive prenatal

testing? An analysis of online pregnancy discussion forums.

Daehn, D., Rudolf, S., Pawils, S. (2022).. Perinatal mental health literacy: knowledge, attitudes, and help-seeking among perinatal women and the public – a systematic review. *BMC Pregnancy Childbirth* **22**, 574 https://doi.org/10.1186/s12884-022-04865-y

Darko, EM, Kleib M, & Olson J. (2022) Social Media Use for Research Participant Recruitment: Integrative Literature Review J Med Internet Res;24(8):e38015

Darling, J. A., Jerde, C. L., & Sepulveda, A. J. (2021). What do you mean by false positive? *Environmental DNA*, *3*(5), 879-883. https://doi.org/10.1002/edn3.194

DeJonckheere, M., & Vaughn, L. M. (2019). Semistructured interviewing in primary care research: A balance of relationship and rigour. *Family Medicine and Community Health*, *7*(2), e000057. https://doi.org/10.1136/fmch-2018-000057

DeLaney, M., & Wood, L. (2021). Urine pregnancy testing: When does no mean maybe? *Journal of the American College of Emergency Physicians Open*, *2*(5).

Denneny, M. (2024). Decoding Promises and Perceptions: A Reflexive Thematic Analysis of the Online Presentation of Noninvasive Prenatal Testing (NIPT) in Top U.S. Brands. *Journal of Consumer Health on the Internet*, *28*(2), 135–156. https://doi.org/10.1080/15398285.2024.2374178

Deutsch, F. M. (2007). Undoing Gender. *Gender & Society*. https://doi.org/10.1177/0891243206293577

Duerksen, S., et al. (2005). Health disparities and advertising content of women's magazines: a cross-sectional study. *BMC Public Health*.

Ethan, D., Basch, C. H., Hillyer, G. C., Berdnik, A., & Huynh, M. (2016). An analysis of weight loss articles and advertisements in mainstream women's health and fitness magazines.

Health Promotion Perspectives, *6*(2), 80-84.

Erdem, S. A., & Harrison-Walker, L. J. (2006). The role of the Internet in physician–patient relationships: The issue of trust. *Business Horizons*, *49*(5), 387-393. https://doi.org/10.1016/j.bushor.2006.01.003

Eugene Labs 2025: https://eugenelabs.com/products/couples-carrier-screening

Fagerlin, A., et al. (2007). Making Numbers Matter: Present and Future Research in Risk Communication. *American Journal of Health Behavior*.

Farrell, R. M., Agatisa, P. K., Mercer, M., & Coleridge, M. B. (2016). Online direct-to-consumer messages about non-invasive prenatal genetic testing. *Reproductive Biomedicine & Society Online*, *1*, 88. https://doi.org/10.1016/j.rbms.2016.02.002

FDA Press Release, Retrieved from: https://www.fda.gov/news-events/press-announcements/fda-warns-risks-associated-non-invasive-prenatal-screening-tests

Gans, J. S., Goldfarb, A., Agrawal, A. K., Sennik, S., Stein, J., & Rosella, L. (2022). False-Positive Results in Rapid Antigen Tests for SARS-CoV-2. *JAMA*, *327*(5), 485. https://doi.org/10.1001/jama.2021.24355

Garcia, E. et al. (2021). Non-invasive prenatal testing (NIPT) and pregnant women's views on good motherhood: a qualitative study. *European Journal of Human Genetics.*

Gill, R. (2007). Postfeminist media culture. *European Journal of Cultural Studies*. https://doi.org/10.1177/1367549407075898

Ghiasi, M., Armour, C., Walker, M., Shaver, N., Bennett, A., & Little, J. (2023). Issues associated with possible implementation of Non-Invasive Prenatal Testing (NIPT) in first-tier screening: A rapid scoping review. *Prenatal Diagnosis*, *43*(1), 62-71. https://doi.org/10.1002/pd.6278

Gitsels–van der Wal, J.T., Manniën, J., Gitsels, L.A. *et al.* Prenatal screening for congenital anomalies: exploring midwives' perceptions of counseling clients with religious backgrounds. *BMC Pregnancy Childbirth* **14**, 237 (2014). https://doi.org/10.1186/1471-2393-14-237Autonomy in Pregnancy. *Children and Childhood through a Genealogical Lens.*

Glanz, K., Rimer, B. K., & Viswanath, K. (Eds.). (2008). *Health behavior and health education: Theory, research, and practice* (4th ed.). Jossey-Bass.

Haaker, M. (2021). The Power of the Pregnant Body: Perspectives of Agency and Autonomy in Pregnancy. *Genealogy*, *5*(1), 13. https://doi.org/10.3390/genealogy5010013

Heath, J., Mitchell, N., & Fletcher, J. (2019). A comparison of termination of pregnancy procedures: Patient choice, emotional impact and satisfaction with care. *Sexual & Reproductive Healthcare*, *19*, 42-49. https://doi.org/10.1016/j.srhc.2018.12.002

Hesse, B. W., Nelson, D. E., Kreps, G. L., Croyle, R. T., Arora, N. K., Rimer, B. K., & Viswanath, K. (2005). Trust and sources of health information: The impact of the Internet and its implications for health care providers: Findings from the first Health Information National Trends Survey. *Archives of Internal Medicine*, *165*(22), 2618–2624. https://doi.org/10.1001/archinte.165.22.2618

Hore, B., Smith, D., Wittkowski, A. (2019) Women's experiences of anxiety during pregnancy: An interpretative phenomenological analysis, Journal of Psychiatry and Behavioral Sciences

Horn, R. (2022). NIPT and the concerns regarding 'routinisation'. *European Journal of Human* Genetics, 30(6), 637-638.

Hussian, T., Choudhary, M., Budhwar, V., & Saini, G. (2021). COVID-19 pandemic: An

era of myths and misleading advertisements. *Journal of Generic Medicines: The Business Journal for the Generic Medicines Sector, 17(2), 49–54.*

Inglis, A., Hippman, C., & Austin, J. (2012). Prenatal testing for Down syndrome: The perspectives of parents of individuals with Down syndrome. *American Journal of Medical Genetics. Part A*, *158A*(4), 743. https://doi.org/10.1002/ajmg.a.35238

Jayashankar, S. S., Nasaruddin, M. L., Hassan, M. F., Dasrilsyah, R. A., Shafiee, M. N., Ismail, N. A.& Alias, E. (2023). Non-Invasive Prenatal Testing (NIPT): Reliability, Challenges, and Future Directions. Diagnostics, 13(15), 2570.

Jesse, D. E., Schoneboom, C., & Blanchard, A. (2007). The Effect of Faith or Spirituality in Pregnancy. *Journal of Holistic Nursing*. https://doi.org/10.1177/0898010106293593

Johnson, K. B., Wei, Q., Weeraratne, D., Frisse, M. E., Misulis, K., Rhee, K., Zhao, J., & Snowdon, J. L. (2021). Precision Medicine, AI, and the Future of Personalized Health Care. *Clinical and Translational Science*, *14*(1), 86-93. https://doi.org/10.1111/cts.12884

Johnston, M., Warton, C., Pertile, M. D., Taylor-Sands, M., Delatycki, M. B., Hui, L., Savulescu, J., & Mills, C. (2023). Ethical issues associated with prenatal screening using non-invasive prenatal testing for sex chromosome aneuploidy. *Prenatal Diagnosis*, *43*(2), 226-234.

Kates, S., & Shaw-Garlock, G. (1999). The Ever-Entangling Web: A Study of Ideologies and Discourses in Advertising to Women. *Journal of Advertising.* Volume 2, pp. 33–49.

Kelly, A., Lawlor, K., & O'Donohoe, S. (2010). Encoding Advertisements: The Creative Perspective. *Journal of Marketing Management*, Volume 21, Issue 5-6.

Kerns, J., Vanjani, R., Freedman, L., Meckstroth, K., Drey, E. A., & Steinauer, J. (2012).

Women's decision making regarding choice of second trimester termination method for pregnancy complications. *International Journal of Gynecology & Obstetrics*, *116*(3), 244-248. https://doi.org/10.1016/j.ijgo.2011.10.016

Kleinschmidt, S., Dugas, J. N., Nelson, K. P., & Feldman, J. A. (2021). False negative point-of-care urine pregnancy tests in an urban academic emergency department: A retrospective cohort study. *Journal of the American College of Emergency Physicians Open*, *2*(3), e12427.

Kliff, S, & Bhatia, A. (2022, January, 1). When They Warn of Rare Disorders, These Prenatal Tests are Usually Wrong. *New York Times.* https://www.nytimes.com/2022/01/01/upshot/pregnancy-birth-genetic-testing.html

Kreuter, M. W., & McClure, S.M. (2004) The Role of Culture in Health Communication.

Kristensson, P., Pedersen, P. E., & Thorbjørnsen, H. (2020). New perspectives on consumer adoption and diffusion of innovations. *Journal of Business Research*, *116*, 522-525. https://doi.org/10.1016/j.jbusres.2020.04.048

Labonté, V., et al. (2019). Psychological and social consequences of non-invasive prenatal testing (NIPT): a scoping review. *Biomedicine and Pregnancy and Childbirth.*

Liu, P. L., Zhang, L., Ma, X., & Zhao, X. (2023). Communication Matters: The Role of Patient-Centered Communication in Improving Old Adults' Health Competence and Health Outcomes. Health Communication, 39(2), 363–375. https://doi.org/10.1080/10410236.2023.2166209

LabCorp 2025: https://womenshealth.labcorp.com/patients/pregnancy/noninvasive-prenatal-screening

Liehr, T. (2022). False-positives and false-negatives in non-invasive prenatal testing (NIPT):

What can we learn from a meta-analyses on > 750,000 tests? *Molecular Cytogenetics*, *15*. https://doi.org/10.1186/s13039-022-00612-2

MacCallum, F., & Widdows, H. (2016). Altered Images: Understanding the Influence of Unrealistic Images and Beauty Aspirations. *Health Care Analysis*, *26*(3), 235. https://doi.org/10.1007/s10728-016-0327-1

Market Research Report (2025): https://markwideresearch.com/us-non-invasive-prenatal-testing-nipt-market/

Marshall, N., Egan, S., Flores, C., Kirsch, A., Mankoff, R., & Resnick, M. (2012). Working Toward a Common Goal: A Collaborative Obstetrics and Gynecology Practice. *Obstetrics and Gynecology Clinics of North America*, *39*(3), 373-382. https://doi.org/10.1016/j.ogc.2012.05.006

McCall, B. (2020). 15 Ways Silicon Valley is Harnessing Big Data for Health. *Nature Medicine*. 26, 7–10.

Meeussen, L., & Van Laar, C. (2018). Feeling Pressure to Be a Perfect Mother Relates to Parental Burnout and Career Ambitions. *Front. Psychol*.

Meyerowitz, Joanne. (2008). A History of "Gender". American Historical Review. 113. 1346-1356. 10.1086/ahr.113.5.1346.

Myriad 2025: https://myriad.com/prenatal-genetic-screening/?utm_source=bing&utm_medium=cpc&utm_campaign=mwh_prenatal_prequel&utm_term=prenatal%20screening%20test&utm_agid=1187474318765390&msclkid=2fee0821a8d91cc2bf946fd5ba9316b2&utm_content=Prenatal%20Screening%2FTest

National Institute of Health:

https://www.nichd.nih.gov/health/topics/down/conditioninfo/diagnosis

National Public Radio: https://www.npr.org/sections/health-shots/2023/06/08/1180838096/an-eating-disorders-chatbot-offered-dieting-advice-raising-fears-about-ai-in-hea

Njio, A., Martin, L., Bekker, M. N., Kater-Kuipers, A., M Timmermans, D. R., Sistermans, E. A., Galjaard, J. H., Henneman, L., & Consortium, D. N. (2021). Routinization of prenatal screening with the non-invasive prenatal test: Pregnant women's perspectives. *European Journal of Human Genetics*, *30*(6), 661. https://doi.org/10.1038/s41431-021-00940-8

Norwitz, E. R., & Levy, B. (2013). Noninvasive Prenatal Testing: The Future Is Now. *Reviews in Obstetrics and Gynecology*, *6*(2), 48. https://pmc.ncbi.nlm.nih.gov/articles/PMC3893900/

Oetting, H. L. (2023). *My Body, Your Politics: A Qualitative Content Analysis of the Protest Paradigm in Traditional and Digital-Born Media, Following the Overturning of Roe v. Wade* [Master's thesis, Ohio University]. OhioLINK Electronic Theses and Dissertations Center. http://rave.ohiolink.edu/etdc/view?acc_num=ohiou1681472768287958

Paek, Hye-Jin & Shah, Hemant. (2003). Racial Ideology, Model Minorities, and the" Not-So-Silent Partner:" Stereotyping of Asian Americans in US Magazine Advertising. Howard Journal of Communications. 14. 225-243. 10.1080/716100430.

Palczewski, C., McGeough, D., and DeFrancisco, V. (2023). *Gender in Communication: A Critical Introduction*. 4th ed., SAGE Publications

Perrot, A., Clarke, A., Vassy, C., & Horn, R. (2024). Women's preferences for NIPT as a first-line test in England and France: Challenges for genetic counseling practices. *Journal of Genetic Counseling*, *33*(6), 1204-1214. https://doi.org/10.1002/jgc4.1839

Peters, E., Västfjäll, D., Slovic, P., Mertz, C. K., Mazzocco, K., & Dickert, S. (2006). Numeracy and Decision Making. *Psychological Science*, *17*(5), 407–413.

Pew Research Center, 2025; https://www.pewresearch.org/social-trends/2020/05/27/as-millennials-near-40-theyre-approaching-family-life-differently-than-previous-generations/

Piechan, J.L., Hines, K.A., Koller, D.L. *et al.* (2016) NIPT and Informed Consent: an Assessment of Patient Understanding of a Negative NIPT Result. *J Genet Counsel* **25**, 1127–1137. https://doi.org/10.1007/s10897-016-9945-x

Ravitsky, V., Roy, M.-C., Haidar, H., Henneman, L., Marhall, J., Newson, A. J., Ngan, O. M. Y., & Nov-Klaiman, T. (2021). The Emergence and Global Spread of Noninvasive Prenatal Testing. *Annual Review of Genomics and Human Genetics*, *22*(1), 309–338.

Rehmann-Sutter, C., Timmermans, D. .M. & Raz, A. Non-invasive prenatal testing (NIPT): is routinization problematic?. *BMC Med Ethics* **24**, 87 (2023). https://doi.org/10.1186/s12910-023-00970-5

Reis, Shmuel & Visser, Adriaan & Frankel, Richard. (2013). Health information and communication technology in healthcare communication: The good, the bad, and the transformative. Patient education and counseling. 93. 359-62. 10.1016/j.pec.2013.10.007.

Rubin, H. J., & Rubin, I. S. (2005). *Qualitative interviewing: The art of hearing data* (2nd ed.). SAGE Publications. https://doi.org/10.4135/9781452226651

Senft, Theresa & Baym, N.K.. (2015). What does the selfie say? Investigating a global phenomenon. 9. 1588-1606.

Sillence E, Briggs P, Harris PR, Fishwick L. (2007). How do patients evaluate and make use of

online health information? Soc Sci Med. 64(9):1853-62. doi: 10.1016/j.socscimed.2007.01.012. Epub 2007 Feb 27. PMID: 17328998.

Skojo, M., Srebniak, M. I., Henneman, L., Sistermans, E. A., & van der Meij, K. R. (2024). Implementing non-invasive prenatal testing in a national screening program: Lessons learned from the TRIDENT studies. *Best Practice & Research Clinical Obstetrics & Gynaecology*, *97*, 102543. https://doi.org/10.1016/j.bpobgyn.2024.102543

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2007). The affect heuristic. *European Journal of Operational Research*, *177*(3), 1333-1352. https://doi.org/10.1016/j.ejor.2005.04.006

Smith, Stacy & Choueiti, Marc & Pieper, Katherine & Gillig, Traci & Lee, Carmen & DeLuca, Dylan. (2015). Inequality in 700 Popular Films: Examining Portrayals of Gender, Race, & LGBT Status from 2007 to 2014.

Smith, M., & Visootsak, J. (2013). Noninvasive screening tools for Down syndrome: A review. *International Journal of Women's Health*, *5*, 125-131. https://doi.org/10.2147/IJWH.S31183

Straker, K., et al. (2021). Designing a dangerous Unicorn: Lessons from the Theranos case. *Business Horizons*. Volume 64, Issue 4, July–August 2021, Pages 525-536

Stanger-Hall, K. F., & Hall, D. W. (2011). Abstinence-only education and teen pregnancy rates: why we need comprehensive sex education in the U.S. *PLoS One*, *6*(10), e24658. https://doi.org/10.1371/journal.pone.0024658

Thiede, M. (2005). Information and access to health care: Is there a role for trust? *Social Science & Medicine*, *61*(7), 1452-1462. https://doi.org/10.1016/j.socscimed.2004.11.076

Thomas, J., Harraway, J., & Kirchhoffer, D. (2021). Non-invasive prenatal testing:

clinical utility and ethical concerns about recent advances. *The Medical Journal of Austrailia.*

Thomas, S. P., Keller, M. A., Ranson, T., & Willard, R. E. (2023). Patient perspectives on noninvasive prenatal testing among black women in the United States: A scoping review. BMC Pregnancy and Childbirth, 23(1), 183.

Travis, C., Howerton, D., & Szymanski, D. (2012). Risk, Uncertainty, and Gender Stereotypes in Healthcare Decisions. *Women & Therapy*, Volume 35, Issue 3-4.

Van den Berg, M., Timmermans, D. R., Ten Kate, L. P., Van Vugt, J. M., & Van der Wal, G. (2006). Informed decision making in the context of prenatal screening. *Patient Education and Counseling*, *63*(1-2), 110-117. https://doi.org/10.1016/j.pec.2005.09.007

van der Meij KRM, Kooij C, Bekker MN, Galjaard RH, Henneman L; Dutch NIPT Consortium (2021). Non-invasive prenatal test uptake in socioeconomically disadvantaged neighborhoods. Prenat Diagn. 2021Wang, J., et al., (2019). Lower detectability of non-invasive prenatal testing compared to prenatal diagnosis in high-risk pregnant women

Vanstone, M., King, C., De Vrijer, B., & Nisker, J. (2014). Non-Invasive Prenatal Testing: Ethics and Policy Considerations. *Journal of Obstetrics and Gynaecology Canada*, *36*(6), 515-526. https://doi.org/10.1016/S1701-2163(15)30568-5

Verniers, C., Bonnot, V., & Assilaméhou-Kunz, Y. (2022). Intensive mothering and the perpetuation of gender inequality: Evidence from a mixed methods research. *Acta Psychologica*, *227*, 103614. https://doi.org/10.1016/j.actpsy.2022.103614

Weil, J. (2002). Genetic counselling in the era of genomic medicine: As we move towards personalised medicine, it becomes more important to help patients understand genetic tests and make complex decisions about their health. *EMBO Reports*, *3*(7), 590-593.

Weinstein, N. D., & Sandman, P. M. (2008). A model of the precaution adoption process: Evidence from home radon testing. Health Psychology, 21(2), 148-155.

Wejnert, B. (2003). Integrating Models of Diffusion of Innovations: A Conceptual Framework Yang, W., Guo, Z., Shi, W., Qin, L., Xia, X., Hao, B., & Liao, S. (2023). Security and Sharing of NIPT Data Are the Basis of Ethical Decision-Making Related to Non-Medical Traits. *The American Journal of Bioethics*, *23*(3), 29–31. https://doi.org/10.1080/15265161.2023.2169392

Witte, K., & Allen, M. (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education & Behavior*, *27*(5), 591–615. https://doi.org/10.1177/109019810002700506

West, C., & Zimmerman, D. H. (1987). Doing Gender. *Gender & Society*. https://doi.org/10.1177/0891243287001002002

Wilson, S., Tolley, C., Mc Ardle, R., Lawson, L., Beswick, E., Hassan, N., Slight, R., & Slight, S. (2024). Recommendations to advance digital health equity: A systematic review of qualitative studies. *Npj Digital Medicine*, *7*(1), 1-9. https://doi.org/10.1038/s41746-024-01177-7

Yan, Tony & Hyman, Michael. (2022). How can we minimize visual stereotypes in ads?. Journal of Current Issues and Research in Advertising. 43. 185-199. 10.1080/10641734.2021.1957044.

Yee, L., Simon, M. (2014). The Role of Health Literacy and Numeracy in Contraceptive Decision-Making for Urban Chicago Women. *Journal of Community Health.*

Yuan, Y., & Lee, K. S. (2022). General trust in the health care system and general trust in

physicians: *A multilevel analysis of 30 countries. International Journal of Comparative Sociology.*

Yuill, C., McCourt, C., Cheyne, H. (2020). Women's experiences of decision-making and informed choice about pregnancy and birth care: a systematic review and meta-synthesis of qualitative research. *BMC Pregnancy and Childbirth*, [1] *20*, 343. https://doi.org/10.1186/s12884-020-03033-6

Zaami, S., Orrico, A., Signore, F., Cavaliere, A. F., Mazzi, M., & Marinelli, E. (2021). Ethical, Legal and Social Issues (ELSI) Associated with Non-Invasive Prenatal Testing: Reflections on the Evolution of Prenatal Diagnosis and Procreative Choices. *Genes*, *12*(2). https://doi.org/10.3390/genes12020204

Zabak, S., Varma, A., Bansod, S., & Pohane, M. R. (2023). Exploring the Complex Landscape of Delayed Childbearing: Factors, History, and Long-Term Implications. *Cureus*, *15*(9), e46291. https://doi.org/10.7759/cureus.46291

Zhao, Q., Chen, J., Ren, L. *et al.* Two cases of placental trisomy 21 mosaicism causing false-negative NIPT results. *Mol Cytogenet* 16, 16 (2023)

APPENDIX & EXHIBITS

Appendix A: Interview Guide
Appendix B: Themes
Appendix C: Recruitment Flyer
Appendix D: Sample of Promotional Materials
Appendix E: Participant Demographic Table
Exhibit 1: Location
Exhibit 2: Age
Exhibit 3: Race/Ethnicity
Exhibit 4: Pregnancy Status
Exhibit 5: Sexuality
Exhibit 6: Education
Exhibit 7: Employment Status
Exhibit 8: Household Income

APPENDIX A: Interview Guide

Warm-Up

1. Tell me about yourself.
2. Can you please share how your pregnancy experience is going or how it went?
3. Are you doing anything fun this summer?
4. Tell me about one of your favorite hobbies.

Baseline NIPT Knowledge

3. Have you heard of noninvasive prenatal testing? (Respondents could call it genetic testing, gene testing, etc.)
    a. If yes, what have you heard? Or What do you know?
    b. If not, how come? (I want to ask something here to understand if folks haven't heard about it because of less traditional choices or if they don't know if they have heard about it because it wasn't explained clearly)
    c. Where have you heard of the test? Friends? Doctors? Web Ads? TV Commercials? Other?

Experience with NIPT

4. Have you done NIPT?
    a. If yes, can you please describe your experience?
    b. If you had a negative experience, can you explain in more detail what happened?
    c. Was it administered by a health professional, or did you take one at home?
    d. If no, what factors contributed to you not taking the test?
    e. How did you feel when you took the test? (confident, anxious, nonchalant, etc.)
5. If you have taken the test, what were your main motivations?
    f. To determine if genetic abnormalities were present? The health of the baby? The doctor told you to?
6. If you chose not to take the test, why was this your decision?
7. In either case, did you have fear or anxiety around taking the test or the idea of taking the test?
8. Did you feel pressure to take the test? Please explain.
    a. Do you feel like your gender impacted your decision? Why or why not?
9. If you took the test, would you take the test again or recommend it to a friend or loved one? Why or why not?
10. Did the test impact any of your decisions around your pregnancy?
111. In cases where NIPT is declined, what additional information might change your decision-making process?

Engagement with NIPT Related Media

12. Is there any additional information you would have liked to know to persuade you to take the test?

13. I will show you promotional materials related to NIPT. Can you please tell me your first impressions?
14. Based on these promotional materials, what is the main message you receive?
15. What feelings come up for you when reading the language and seeing the images?
16. Based on these materials, do you trust the information provided? Why or why not?
17. Are any parts of the materials that are hard for you to understand or unclear? Which ones?
18. How do you identify (or don't identify) within the materials?
19. What information is missing from these materials?
20. How would you define false-positive and false-negative?
21. What questions do you still have?
22. Imagine I'm your partner (mom, friend, etc.) and you were explaining NIPT to me – how would you do that?

Community

23. Can you describe your in-person community/who has been most supportive during your pregnancy?
24. Do you utilize online platforms for resources around NIPT, pregnancy, etc.? If so, which ones?

Conclusion

23. Do you have anything else you would like to share that I haven't asked you?
24. Do you have any questions for me?

APPENDIX B: Themes

Theme 1: Personal Perspectives - Values & Life Goals
Sub-theme 1.1: Personal Identity and Life Goals
Sub-theme 1.2: Other Past Health Choices & Experiences
Sub-theme 1.3: Intersectionality of Race, Class, and Cultural Contexts

Theme 2: Navigating Norms - Stigma, Autonomy & Expectations
Sub-theme 2.1: The Social Stigma of Pregnancy Choices and the "One-Size-Fits-All" Approach
Sub-theme 2.2: The Role of Gender and Reproductive Autonomy
Sub-theme 2.3: Religion, Disabilities, and Beliefs

Theme 3: Emotional and Psychological Impacts of Pregnancy & Loss
Sub-theme 3.1: Navigating Miscarriage and Pregnancy Loss
Sub-theme 3.2: Infertility, IVF, & Time

Theme 4: Navigating Healthcare Access and Support - Choices, Barriers, and Needs
Sub-theme 4.1: Healthcare Experiences and the Need for Better Support
Subtheme 4.2: Doctor vs. Midwife: Approaches to Pregnancy Care
Sub-theme 4.3: Financial and Accessibility Barriers to Prenatal Testing

Theme 5: Social Networks & Online Communities
Sub-theme 5.1: Family, Societal Expectations, and Social Media Influence
Sub-theme 5.2: Partner Relationships and Decision-Making
Sub-theme 5.3: The Impact of Social Media and Online Communities
Sub-theme 5.4: Lack of Positivity in Pregnancy Narratives

Theme 6: Messaging Matters
Sub-theme 6.1: Information Accessibility and Media Literacy
Sub-theme 6.2: Influence of Promotional Materials

APPENDIX C: Recruitment Flyer

FEMALE INTERVIEW PARTICIPANTS NEEDED!

University of Oregon Researcher
Studying the Advertising of Non-Invasive Prenatal Testing (NIPT)

If interested, scan the code below or email:
niptstudy1@gmail.com

SCAN ME

- $25 GIFT CARD
- 1-HOUR TIME COMMITMENT
- VIA ZOOM OR IN-PERSON
- MUST BE PREGNANT, CONSIDERING PREGNANCY, OR RECENTLY PREGNANT
- INFORMATION KEPT CONFIDENTIAL
- MUST BE 18 YEARS OR OLDER
- THIS STUDY IS BEING DONE FOR RESEARCH PURPOSES

APPENDIX D: Sample Promotional Materials

1.) The website for LabCorp featuring the page where users can create a patient profile, make an appointment, order a lab, receive results, and pay bills online.

2.) The brochure for Myriad (Prequel) that explains how a patient can order a lab and have results sent directly to Myriad for testing, and results are sent from their lab.

3.) The Expecting Parents Discussion Guide" from Roche (Harmony) offers ideas of questions to ask a doctor about the Harmony test.

4.) The "patient resources" for Natera (Panorama) to learn about ordering a blood test.

5.) Invitae test ordering page offers an at-home genetic carrier screening test.

APPENDIX E: Participant Demographic Table

Pseudonym	Age	Race/Ethnicity	Pregnancy Status
Willa	26-30	White/Caucasian	Recently Pregnant
Alex	26-30	White/Caucasian	Pregnant First Trimester
Ruth	31-35	Black or African American	Pregnant Second/Third Trimester
Franchesca	26-30	Black or African American	Pregnant Second/Third Trimester
Nikia	26-30	Black or African American	Pregnant Second/Third Trimester
Rachel	36-40	White/Caucasian	Recently Pregnant
Macy	26-30	White/Caucasian	Considering Pregnancy
Noelle	21-25	Black or African American	Pregnant First Trimester
Ameilia	21-25	White/Caucasian	Considering Pregnancy
Grace	26-30	White/Caucasian	Recently Pregnant
Maeve	31-35	White/Caucasian & Hispanic/Latino/Spanish Origin	Pregnant Second/Third Trimester
Taylor	26-30	Black or African American	Pregnant First Trimester
Leilani	26-30	American Indian/Alaska Native & Asian/Pacific Islander	Considering Pregnancy
Danielle	26-30	Black/African American	Pregnant Second/Third Trimester
Blake	36-40	White/Caucasian	Recently Pregnany
Maggie	21-25	White/Caucasian	Considering Pregnancy
Esme	26-30	Hispanic/Latino/Spanish Origin	Recently Pregnant
Paige	26-30	White/Caucasian	Considering Pregnancy
Madeline	31-35	White/Caucasian	Pregnant First Trimester
Lea	31-35	White/Caucasian	Considering Pregnancy
Eleanor	31-35	White/Caucasian	Pregnant First Trimester
Claire	31-35	White/Caucasian	Pregnant Second/Third Trimester
Judy	31-35	White/Caucasian	Pregnant Second/Third Trimester
Bethany	36-40	White/Caucasian	Pregnant Second/Third Trimester
Deborah	31-35	White/Caucasian	Recently Pregnant
Hali	26-30	White/Caucasian	Pregnant Second/Third Trimester
Isabelle	31-35	Hispanic/Latino/Spanish Origin	Recently Pregnant
Kathryn	31-35	White/Caucasian	Recently Pregnant
Justine	26-30	White/Caucasian	Considering Pregnancy
Vanessa	31-35	White/Caucasian	Considering Pregnancy

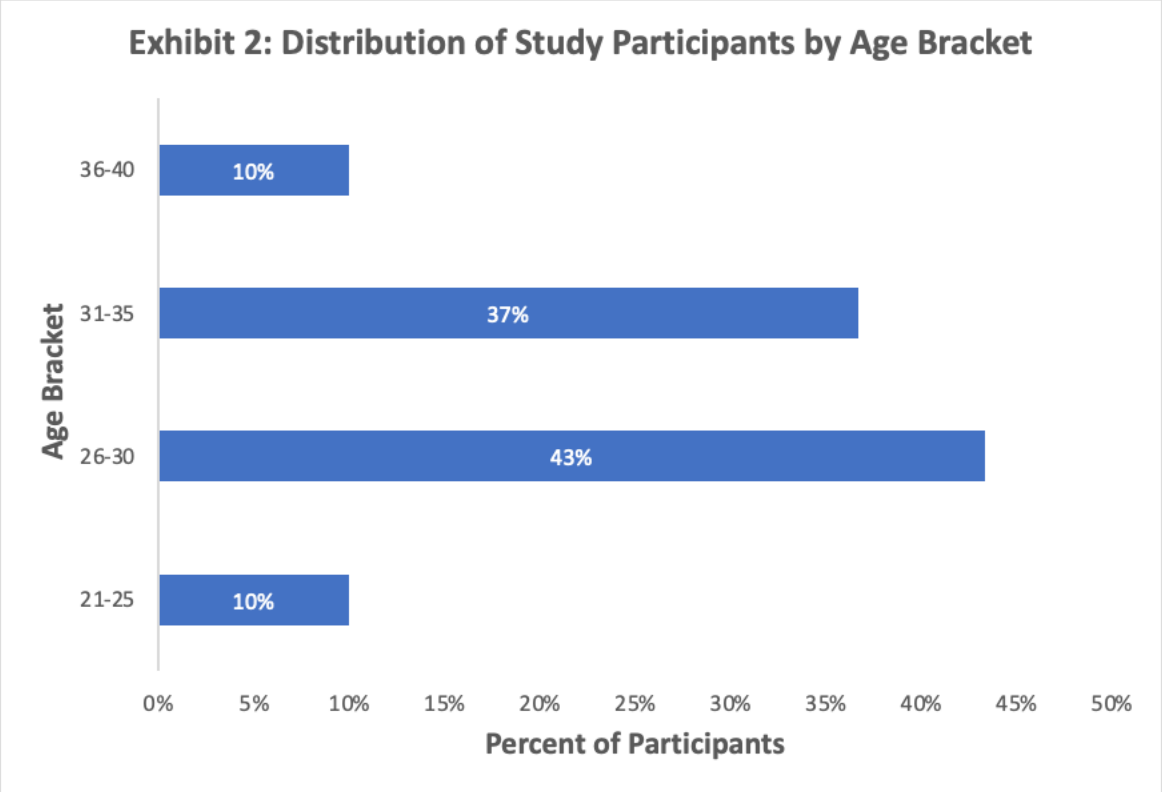
Pseudonym	Education	Employment
Willa	Master's Degree, Professional Degree, or Above	Unemployed, not looking for work
Alex	Master's Degree, Professional Degree, or Above	Full-time employment
Ruth	Bachelor's Degree	Full-time employment
Franchesca	Bachelor's Degree	Part-time employment
Nikia	Bachelor's Degree	Part-time employment
Rachel	Master's Degree, Professional Degree, or Above	Full-time employment
Macy	Master's Degree, Professional Degree, or Above	Full-time employment
Noelle	Bachelor's Degree	Self-employed
Ameilia	Bachelor's Degree	Self-employed
Grace	Master's Degree, Professional Degree, or Above	Full-time employment
Maeve	High School Diploma, Associates Degree, or Equivalent	Full-time employment
Taylor	Bachelor's Degree	Part-time employment
Leilani	Bachelor's Degree	Part-time employment
Danielle	Bachelor's Degree	Full-time employment
Blake	Bachelor's Degree	Part-time employment
Maggie	High School Diploma, Associate's Degree, or Equivalent	Full-time employment
Esme	Bachelor's Degree	Part-time employment
Paige	Master's Degree, Professional Degree, or Above	Full-time employment
Madeline	Master's Degree, Professional Degree, or Above	Full-time employment
Lea	Bachelor's Degree	Self-employed
Eleanor	Master's Degree, Professional Degree, or Above	Full-time employment
Claire	Master's Degree, Professional Degree, or Above	Full-time employment
Judy	Bachelor's Degree	Self-employed
Bethany	Bachelor's Degree	Full-time employment
Deborah	Master's Degree, Professional Degree, or Above	Full-time employment
Hali	Master's Degree, Professional Degree, or Above	Full-time employment
Isabelle	Bachelor's Degree	Full-time employment
Kathryn	Bachelor's Degree	Unemployed, not looking for work
Justine	Bachelor's Degree	Full-time employment
Vanessa	Bachelor's Degree	Full-time employment

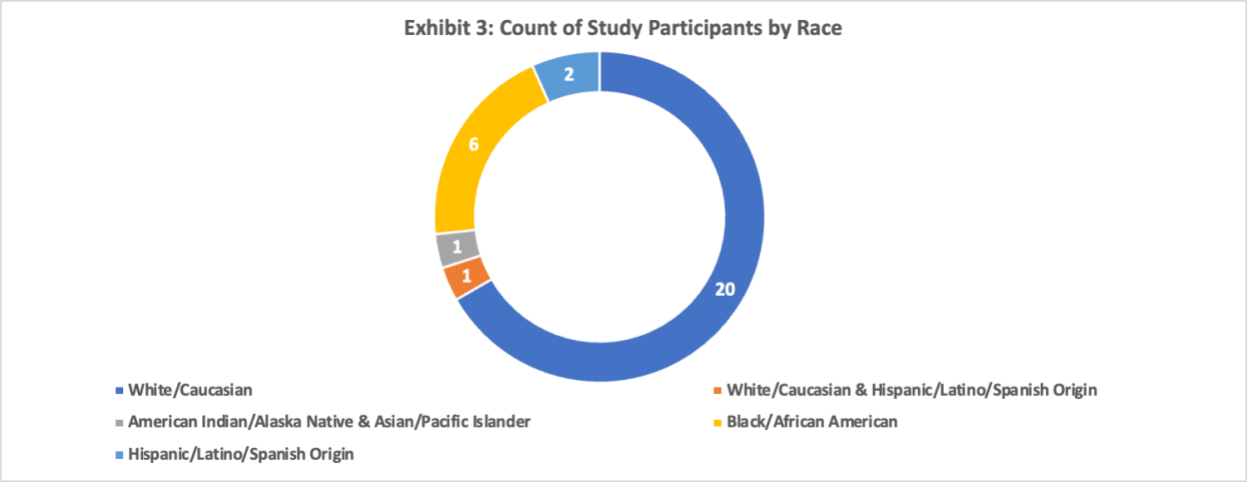
Pseudonym	Relationship Status	Sexuality
Willa	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Alex	Married, Cohabitating, Domestic Partnership	Queer, Asexual
Ruth	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Franchesca	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Nikia	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Rachel	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Macy	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Noelle	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Ameilia	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Grace	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Maeve	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Taylor	Married, Cohabitating, Domestic Partnership	Lesbian
Leilani	Single, never married	Heterosexual or Straight
Danielle	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Blake	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Maggie	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Esme	Married, Cohabitating, Domestic Partnership	Bisexual
Paige	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Madeline	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Lea	Married, Cohabitating, Domestic Partnership	Bisexual
Eleanor	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Claire	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Judy	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Bethany	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Deborah	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Hali	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Isabelle	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Kathryn	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Justine	Married, Cohabitating, Domestic Partnership	Heterosexual or Straight
Vanessa	Single, never married	Heterosexual or Straight

Pseudonym	Annual Household Income	Location
Willa	Below $60,000 annually	Arvada, CO
Alex	Above $60,000 annually	Westminster, CO
Ruth	Above $60,000 annually	Roswell City, GA
Franchesca	Above $60,000 annually	Houston, TX
Nikia	Below $60,000 annually	Miami, FL
Rachel	Above $60,000 annually	Westminster, CO
Macy	Above $60,000 annually	Westminster, CO
Noelle	Below $60,000 annually	Portland, OR
Ameilia	Below $60,000 annually	Astoria, OR
Grace	Above $60,000 annually	Firestone, CO
Maeve	Above $60,000 annually	Eugene, OR
Taylor	Below $60,000 annually	Portland, OR
Leilani	Above $60,000 annually	Oregon City, OR
Danielle	Above $60,000 annually	NY, NY
Blake	Above $60,000 annually	Ft. Collins, CO
Maggie	Below $60,000 annually	Bend, OR
Esme	Above $60,000 annually	Eugene, OR
Paige	Above $60,000 annually	Arvada, CO
Madeline	Above $60,000 annually	Albany, OR
Lea	Above $60,000 annually	Eugene, OR
Eleanor	Above $60,000 annually	Richmond, VA
Claire	Above $60,000 annually	Zionsvile, IN
Judy	Below $60,000 annually	Ft. Collins, CO
Bethany	Above $60,000 annually	Arvada, CO
Deborah	Above $60,000 annually	St. Augustine
Hali	Above $60,000 annually	Westminster, CO
Isabelle	Above $60,000 annually	Cottage Grove, OR
Kathryn	Below $60,000 annually	Cottage Grove, OR
Justine	Above $60,000 annually	Westminster, CO
Vanessa	Below $60,000 annually	Chicago, IL

Exhibit 1: Interviews by State

State	Count
Oregon	11
Colorado	11
Florida	2
Texas	1
Virginia	1
Illinois	1
Georgia	1
New York	1
Indiana	1
Total	30





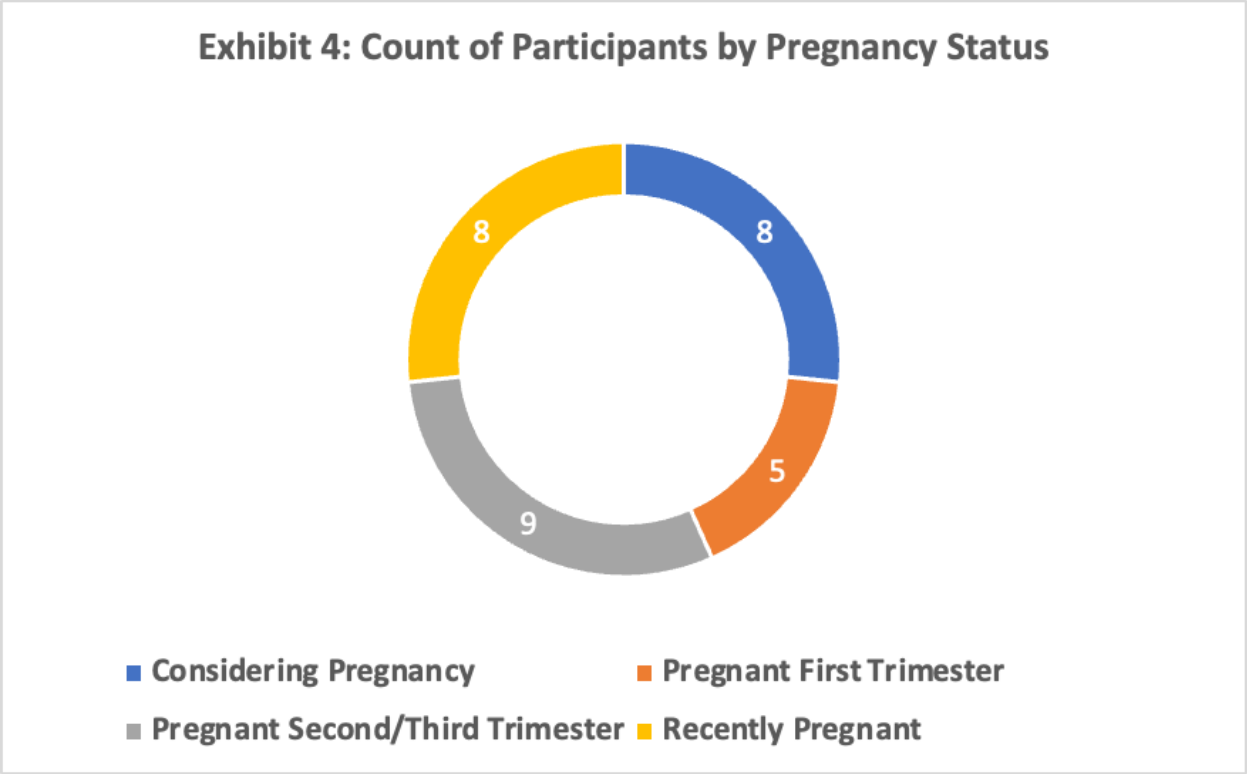


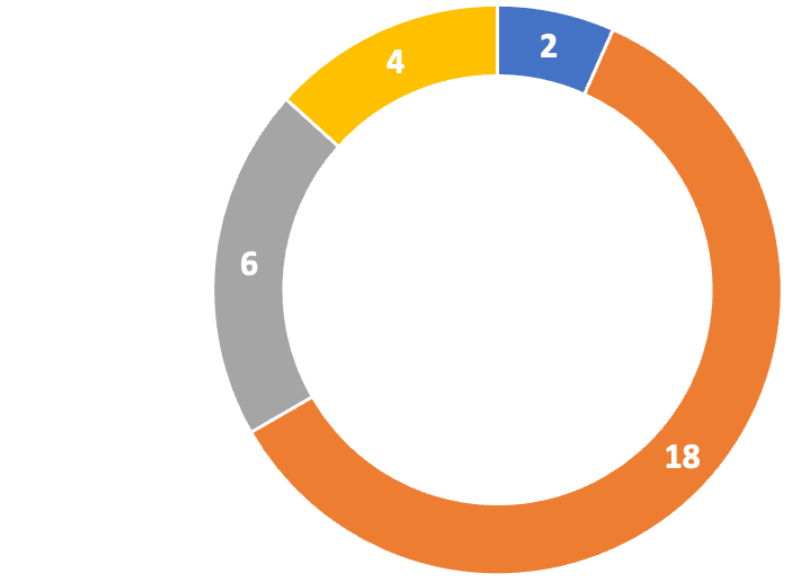
Exhibit 5: Count of Participants by Sexuality

Sexuality	Count of Participants
Heterosexual or Straight	26
Bisexual	2
Lesbian	1
Queer, Asexual	1
Total	**30**

Exhibit 6: Count of Participants by Education

Education	Count of Participants
High School Diploma, Associates Degree, or Equivalent	2
Bachelor's Degree	17
Master's Degree, Professional Degree, or Above	11
Total	**30**

Exhibit 7: Count of Study Participants by Employment Status



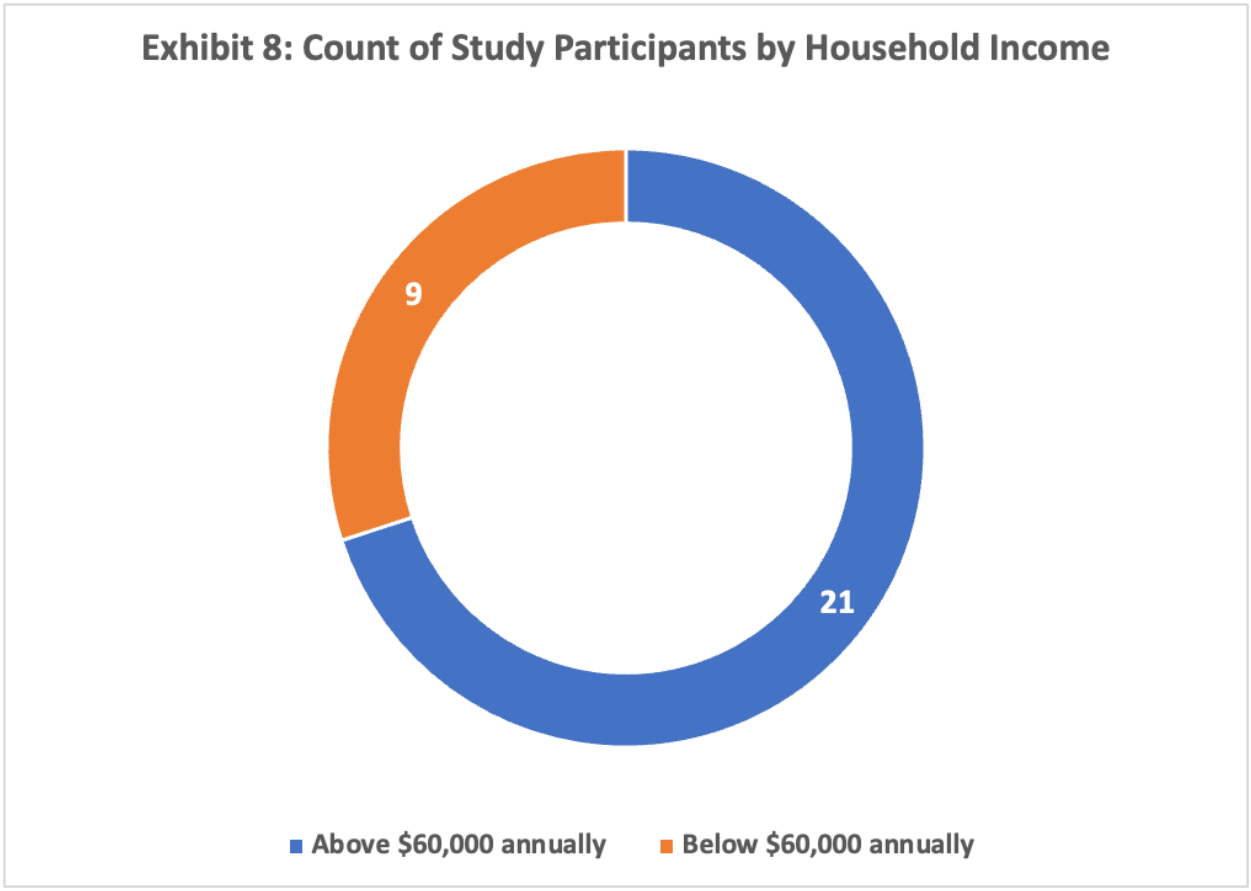


Exhibit 8: Count of Study Participants by Household Income
9
21
Above $60,000 annually
Below $60,000 annually