EXPLORING HEALTHCARE PROVIDERS SUBSTANCE ABUSE SCREENING BEHAVIORS DURING ROUTINE PRENATAL CARE

By

JARRETT NATHANIEL BRUNNY

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2017
To writers, great and small, architects of worlds that defy time and entropy
ACKNOWLEDGMENTS

This work would not have been possible without the unwavering support of my family and my friends. I am forever grateful for my wife and partner in life, Bethany. I am thankful for my children, Tai and Lillia, who humble me constantly and bring me serenity and joy. I thank my mother, Ronnie, my brother, Jacob, and his family - Monica, Grant, and Finn Brunny - for their stability and their love. I thank Neil Drake for his humor and practicality. I thank the Finkels, the Cohens, the Masters, and the Parkers.

Special mention must go to all my friends, who will know their significance to me. I send love and support to my graduate cohort, my students, and my peers at the University of Florida.

This dissertation has been forged in the apprenticeship of scientists that through their tenacity and brilliance have shaped my work for the better. I thank Mary Ellen Young, Mickie Swisher, Jaime Pomeranz, Mark Hart, and Kay Roussos-Ross for serving on this committee. I thank Julie Baldwin and the late Otto von Mering for opening doors for me, many years ago, into the world of public health, and I thank them for their critical mentorship. I thank Karen Harris, ACOG, and Healthy Start for being partners in trust to this research.

Lastly, I thank the families that strive for their children and the advocates that help give credence to their stories.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ACKNOWLEDGMENTS</strong></td>
<td>4</td>
</tr>
<tr>
<td><strong>LIST OF TABLES</strong></td>
<td>7</td>
</tr>
<tr>
<td><strong>LIST OF FIGURES</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>LIST OF ABBREVIATIONS</strong></td>
<td>9</td>
</tr>
<tr>
<td><strong>ABSTRACT</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>CHAPTER</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1 BACKGROUND</strong></td>
<td>12</td>
</tr>
<tr>
<td>The Global Drug Trade</td>
<td>12</td>
</tr>
<tr>
<td>Patterns of Domestic Drug Importation and Use</td>
<td>14</td>
</tr>
<tr>
<td>Non-Medical Use of Psychotherapeutic Pharmaceuticals</td>
<td>16</td>
</tr>
<tr>
<td>Implications for Maternal and Child Health</td>
<td>19</td>
</tr>
<tr>
<td>Effective Approaches to Drug Exposure Screening</td>
<td>23</td>
</tr>
<tr>
<td>Problem Statement</td>
<td>25</td>
</tr>
<tr>
<td>Current Study</td>
<td>27</td>
</tr>
<tr>
<td><strong>2 DESIGN AND METHODOLOGY</strong></td>
<td>30</td>
</tr>
<tr>
<td>Approach</td>
<td>30</td>
</tr>
<tr>
<td>Recruitment and Participation, Aims 1 and 2</td>
<td>30</td>
</tr>
<tr>
<td>Recruitment and Participation, Aim 3</td>
<td>33</td>
</tr>
<tr>
<td>Data Collection, Aim 1</td>
<td>34</td>
</tr>
<tr>
<td>Data Collection, Aim 2</td>
<td>35</td>
</tr>
<tr>
<td>Data Collection, Aim 3</td>
<td>36</td>
</tr>
<tr>
<td>Methods</td>
<td>38</td>
</tr>
<tr>
<td>Grounded Theory Analyses</td>
<td>38</td>
</tr>
<tr>
<td>Confirmatory Questionnaire Analyses</td>
<td>40</td>
</tr>
<tr>
<td>Pilot Index Analyses</td>
<td>42</td>
</tr>
<tr>
<td><strong>3 RESULTS</strong></td>
<td>46</td>
</tr>
<tr>
<td>Exploring Substance Abuse Screening Behaviors with Grounded Theory</td>
<td>46</td>
</tr>
<tr>
<td>Core Themes</td>
<td>47</td>
</tr>
<tr>
<td>Motivational Factors</td>
<td>47</td>
</tr>
<tr>
<td>Screening origins</td>
<td>47</td>
</tr>
<tr>
<td>Patient characteristics and provider bias</td>
<td>50</td>
</tr>
<tr>
<td>Environmental Factors</td>
<td>53</td>
</tr>
<tr>
<td>Psychological Influences</td>
<td>56</td>
</tr>
<tr>
<td>Table</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>1-1</td>
<td>Pregnancy risk categories.</td>
</tr>
<tr>
<td>1-2</td>
<td>The 4P’s Plus index.</td>
</tr>
<tr>
<td>3-1</td>
<td>Factor frequency chart from an expert panel.</td>
</tr>
</tbody>
</table>
## LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-1</td>
<td>Confirmatory factor-ranking tool.</td>
<td>45</td>
</tr>
<tr>
<td>2-2</td>
<td>Listed motivators to substance abuse screening.</td>
<td>45</td>
</tr>
<tr>
<td>3-1</td>
<td>An emergent model of factors.</td>
<td>74</td>
</tr>
<tr>
<td>3-2</td>
<td>Reciprocal determinism among core themes.</td>
<td>75</td>
</tr>
<tr>
<td>4-1</td>
<td>Modeled pathways to screening.</td>
<td>85</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>ACOG</td>
<td>American Congress of Obstetricians and Gynecologists</td>
<td></td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention</td>
<td></td>
</tr>
<tr>
<td>CQCA</td>
<td>Conventional Qualitative Content Analysis</td>
<td></td>
</tr>
<tr>
<td>FBDR</td>
<td>Florida Birth Defects Registry</td>
<td></td>
</tr>
<tr>
<td>MCH</td>
<td>Maternal and Child Health</td>
<td></td>
</tr>
<tr>
<td>NAS</td>
<td>Neonatal Abstinence Syndrome</td>
<td></td>
</tr>
<tr>
<td>NICU</td>
<td>Neonatal Intensive Care Unit</td>
<td></td>
</tr>
<tr>
<td>NSO</td>
<td>Novel Synthetic Opioids</td>
<td></td>
</tr>
<tr>
<td>OBGYN</td>
<td>Obstetrics and Gynecology</td>
<td></td>
</tr>
<tr>
<td>PRAMS</td>
<td>Pregnancy Risk Assessment Monitoring System</td>
<td></td>
</tr>
<tr>
<td>SBIRT</td>
<td>Screening, Brief Intervention, Referral, Treatment</td>
<td></td>
</tr>
<tr>
<td>SIDS</td>
<td>Sudden Infant Death Syndrome</td>
<td></td>
</tr>
</tbody>
</table>
Exploring Healthcare Providers Substance Abuse Screening Behaviors During Routine Prenatal Care

By
Jarrett Nathaniel Brunny

December 2017

Chair: Mary Ellen Young
Major: Public Health – Social and Behavioral Sciences

Morbidity and mortality rates associated with drug misuse and substance abuse are at record levels around the globe. Rises in drug use prevalence have increased substance exposures during pregnancy as well as negative perinatal health outcomes. Universal implementation of validated substance abuse screening tools during prenatal care has been shown to mitigate harmful effects to the mother and child. The purpose of this dissertation is to explore factors influencing substance abuse screening choices among obstetricians and midwives in Florida.

An SBIRT approach is recommended as a standardized modality of screening and referral during prenatal care. SBIRT is supported by ACOG and leading agencies. However, regional data suggests that most providers in Florida do not engage in universal screening, nor do they use validated standardized screening tools.

In the first stage of research, an exploratory grounded theory approach was used to create a theoretical model of behavior emerging from interviews with four obstetricians and three midwives. A reciprocal deterministic relationship was discovered.
between latent domains influencing providers behaviors. These domains included environmental factors, providers’ attitudes, and motivational factors.

A confirmatory approach using digital surveys was used during stage two of this research to independently triangulate the behavioral model. A cohort of seven obstetricians and one midwife completed factor generation and ranking exercises. Top ranking factors were lack of awareness of community resources, providers knowledge of validated substance abuse screening tools, time, and costs.

In the final stage, preliminary items representing attitude were tested for internal consistency. Inter item and item total correlational tests were used to test a pilot index with a Cronbachs Alpha score of .87. However, sample size and low variance of participants response patterns limited the ability of this index to inform domain structure or contribute to factor modeling.

Results of this unified study will be used to provide a framework that future substance abuse screening interventions may be built upon. Broader impacts include a deeper understanding of what guides behaviors in health systems, and subsequent potential for reductions to maternal and child morbidity and mortality.
CHAPTER 1
BACKGROUND

The Global Drug Trade

Drug use and substance abuse are ongoing public health challenges that have changed dramatically over the last 50 years. The prevalence and incidence of drug-related health problems such as addiction, overdose, and comorbidities in communities around the globe have grown to reach epidemic proportions. The United Nations Office on Drugs and Crime (UNODC, 2014, p.1) estimates that 3.5% to 7% of the world’s population actively used drugs in 2012, and over 183,000 drug related deaths were recorded globally in the same period. These rates are a direct result of the growth and scaling of illicit drug markets, as well as demographic shifts and changing cultural norms around drug use. Extensive innovation within the pharmaceutical industry and saturation of addictive psychotherapeutics in communities have contributed to public health crises that continues largely unabated by public policy, the war on drugs, and ongoing community prevention efforts.

In addition to developments in drug chemistry that have resulted in more potent, effective, and addictive illicit drug products, there has been rapid advancement of black market producers’ ability to distribute their products internationally. Production levels of opium, a plant ingredient use to create morphine and heroin, exceeded 7500 metric tons annually in 2015 (UNODC, 2015, p. 2). This level of growth far outpaces growth in markets for cocaine, amphetamines, and other illicit drugs combined. Currently, Afghanistan leads the global plant-based opium and opium-derivatives agricultural trade (Pagel, 2009), evidenced by the substantial percentage of dedicated land that is used for crop growth.
The geography of opium production at the close of the 20th century was centered in Myanmar and Southeast Asia (CIA, 2017). After the turn of the century, in conjunction with challenges to regional stability across the Middle-East from war, opium production boomed in Afghanistan and declined in Southeast Asia. One potential driver of change in global production of opium towards regions of instability, aside from agricultural opportunism resulting from decreased drug enforcement during times of crisis, was pharmaceutical innovation in Asian markets. Advances in technology enabled laboratory production of synthetic opioids, methamphetamines, and designer drugs in mass quantities, decreasing the need for highly visible opium crops. In this scenario, Afghanistan growers may be said to be responsive to the economic forces of supply and demand in the opium black market. Compared to designer drugs, growth and production of opium is inefficient and a higher-risk enterprise, yet requires less technical competence and investment.

When agricultural production of opium shifted away from Asia, the networks built through criminal drug production did not dissipate. Rather, criminal organizations evolved to use more efficient production methods and combined them with time-tested distribution networks (CIA, 2017). Currently, drug markets in East Asia drive production of the base chemicals used to create methamphetamine for distribution in the U.S. and Mexico (Gilbreath, 2015). The same network of laboratories producing amphetamines have been linked to the production of Novel Synthetic Opioids (NSO). NSO class drugs are largely unstudied, yet have been found in counterfeit pharmaceuticals after seizures among recreational users in the U.S. and abroad (Baumann et al., 2017).
Consequently, new drugs are first being tested on recreational users rather than by use of animal models that typically would only proceed to studies in humans once strict safety criteria were met within controlled clinical environments (Fabregat-Safont et al., 2017). NSO variates and other designer drugs have been manipulated to increase potency. Increasing drug potency also markedly increases a drug’s risk profile and capacity for harm. Individuals exposed to unregulated synthetic drugs often overdose without realizing what they have taken (Luciano & Perazella, 2014), and there may be no treatment for new drugs beyond palliative care.

As new drugs enter the market and old favorites have new stewards, diffusion of production to split global centers have complicated the efforts of police and security forces combating the problem in individual territories such as Mexico (Dell, 2015). Implications of the global drug trade on political stability are well studied in the Middle-East, however new turmoil has emerged in countries such as the Philippines (Sarmiento, 2017), where political changes have been closely tied to the government’s strong-armed response to the drug trade.

**Patterns of Domestic Drug Importation and Use**

In the United States, seizures of imported drugs are used as proxy measures for importation rates, and some measure of scale may be achieved by extrapolating from contraband volume. Seizures of imported cocaine have steadily decreased since 2005, while importation of marijuana and heroin have increased in volume substantially. Over a five year period, the amount of heroin seized at the borders grew by over 80% (U.S. DOJ, 2016). Despite an increase in border-busts, distribution of illicit drug products moves through domestic import channels rapidly, violently, and in high volume. Markets
in plant-based opium-derivatives are saturated with product grown in Mexico and Columbia, whereas synthetic opioids track primarily to China and Southeast Asia.

At the primary channel of domestic importation, the U.S. Mexico border, drug-related violence is focused on the Mexican side of the border (Heinle, Ferriera, & Shirk, 2017). The violence associated with trafficking and entry does not often carry into communities across the U.S. where the product will eventually be sold, although cartel violence has a long reach. Even while drug wars have escalated and U.S. authorities have sought to crack down on border trafficking, importation through black market channels have been generally successful. One indication of the success of drug importation is the widespread domestic availability of illicit drugs such as heroin and their relative low cost. Efficiencies in production have resulted in reduced cost to consumers, and the current cost of pure heroin per gram at retail is at an all-time low (U.S. DOJ, 2016). Clearly, if border busts presented a problem for importation of opium derivatives it would reflect in the market, availability would decrease, and retail costs to the consumer would increase.

Although the sheer volume of production, importation, and distribution influences access to drugs by U.S. consumers. Domestic cultural norms have shifted in a way that impacts drug use trends as well. Heroin, by example, was once perceived as an inner-city drug used by minorities in inner-cities and consequently relatively absent from mainstream drug culture (Cicero, Ellis, Surratt, & Kurtz, 2014). Today, however, approximately 75% of heroin users live in affluent suburban areas or rural areas, and they were first exposed to prescription opioids as opposed to street drugs (Cicero, Ellis, Surratt, & Kurtz, 2014). Over 90% of heroin users today self-report as white, although
prevalence of use and associated morbidity and mortality have grown in all groups. These data combined serve to discredit perceptions of drug use as a distinctive minority problem (Broz & Ouellet, 2008), a view largely based on racial biases. Indeed, the picture of drug use in the U.S. is one of progressively extreme use of progressively harder drugs with progressively more potent chemical properties in progressively wider populations.

**Non-Medical Use of Psychotherapeutic Pharmaceuticals**

Abuse and misuse of psychotherapeutic drugs such as opioids and analgesics (painkillers), benzodiazepines, tranquilizers, stimulants, and other pharmaceuticals pose specific challenges to understanding and preventing drug-related morbidity and mortality. Unlike plant-based illicit drugs and known synthetic contraband, most psychotherapeutic drugs used in the U.S have legitimately entered the pharmaceuticals market and have an accepted medical use. Due to the pharmacological properties of the drugs, prescriptions that are used with medical supervision may still lead to physiological dependence provided exposure has reached a variable threshold of time and volume. Prescription drug monitoring programs have improved our understanding of the transition from legitimate medical use to misuse and addiction, and some studies have indicated that between 10% to 25% of patients prescribed an opioid for pain relief will abuse the drug in the absence of prevention and intervention (Manubay, Muchow, & Sullivan, 2011; Green, 2017).

It is estimated that of all psychotherapeutics in the world, both legal and illegal, 80% are consumed in the U.S. Domestic use of opioid analgesic pain relievers more than quadrupled in the past 20 years (Manchikanti, Fellows, Ailinani, & Pampati, 2010). The current paradigm of drug use in the U.S. is partially due to industry support for the
drugs without clear communication to prescribing providers about potential addictive side effects. For many years, opioids were advertised as a consequence-free and safe strategy for pain management (Van Zee, 2009). They are not without consequence, as has been seen, but they are remarkably effective for both acute and chronic pain. The efficacy of opioids has been validated across care settings that include short-term use, long-term home care, end-of-life care, post-surgical care, and even for non-emergency symptom relief.

Due to these broad clinical uses, prescriptions of opioids dispensed by U.S. pharmacies increased from 76 million to 207 million between 1993 and 2013 (Volkow, 2014). In areas with the highest rate of dispensation, including many areas of the South and the Northeast, there are an estimated 96 to 143 painkiller prescriptions per 100 people (IMS, 2012).

Prescriptions obtained for legitimate use but misused, intentionally or unintentionally, increase the risk of drug-related morbidity and mortality. Many cases of prescription drug misuse characterized as abuse occur when legitimate prescriptions are obtained for one use and then diverted to friends and family, or otherwise obtained for sale through doctor shopping (the practice of seeking out physicians willing to dispense to a patient that is has otherwise been denied access to the drugs) (Cicero et al., 2011; McDonald & Carson, 2013). Survey data indicates that non-medical use of prescription opioids increased from 4.7% of the U.S. population to 11% of the U.S. population between 2001 and 2013 (Huang et al., 2006; Saha et al., 2016).

Use, misuse, and abuse of psychotherapeutic drugs have had significant impacts on population health. Elevated incidence of drug exposure among U.S. populations
contributed to over 52,000 drug overdose deaths in 2015, 64% of which involved an opioid (Rudd, Seth, & Scholl, 2016). Opioid-linked mortality rates rose drastically over the last decade (1.4 per 100,000 to 5.4 per 100,000) (Chen, Hedegaard, & Warner, 2014). Subsequently, poisoning caused by overdose has overtaken motor vehicle accidents as the number one cause of accidental death (Xu, Murphy, Kochanek, & Bastion, 2016). Aside from implications to mortality, treatment related to misuse of opioids account for an estimated $72 billion in healthcare costs annually (Warner, Chen, Makuc, Anderson, & Miniño, 2011). Many more deaths involve multiple drug exposures such as mixed use of psychotherapeutics in conjunction with alcohol. Benzodiazepines are a leading culprit that when mixed as a multi-drug cocktail can result in extreme respiratory distress.

Public health and law enforcement responses to the rise of psychotherapeutic diversion, misuse, and abuse has had mixed results. Tracking prescription volume by provider has been one tool that enables federal, state, and local police forces to monitor potentially illegal distribution opioid channels. Medical licensure boards have at times eliminated the ability of offending providers to practice medicine or dispense from regional pharmacies through “pill-mill crackdowns” (Kennedy-Hendricks et al., 2016). Whereas in many cases these strategies did limit availability of prescription opioids and related drugs, they were not without consequence. Unintended effects included market movement towards unregulated synthetics, resurgences in heroin use by individuals previously dependent on legitimately-obtained opioids (Kanouse & Compton, 2015), and challenges obtaining legitimate and legal variants of the drugs by patients for whom the prescriptions are justified and necessary for pain management.
Implications for Maternal and Child Health

The rapid changes to domestic importation of illicit drugs, dynamics of access on a population level to medically-licit yet potentially harmful psychotherapeutics, and changing elements of culture add context to the current epidemic of substance abuse in the U.S. Beyond these broad trends, there are specific medical and public health implications of use, misuse, and abuse of drugs during prenatal care. Pertinent to this dissertation, there are also unique solutions in the fields of obstetrics, gynecology, midwifery, and health services administration.

The links between maternal drug use, substance abuse, and adverse neonatal outcomes are well established in the literature (Burgos & Burke, 2009; Behnke & Smith, 2013). Drugs that previously had insufficient evidence of harm and benefited from a cultural perception of safety, such as marijuana, are now often included among substances with potential impact to fetal development (National Academies of Sciences, Engineering, and Medicine, 2017). Maternal and fetal exposure to different drug classes, including alcohol, tobacco, pharmaceuticals, and illicit drugs have been implicated in miscarriage, fetal death, preterm birth, birth defects, conditions resulting in disability throughout the lifespan, as well as neonatal addiction (Cornelius & Day, 2000; Yazdy, Mitchell, Tinker, Parker, & Werler, 2013; Khan, Robinson, Smith, & Dillard, 2013).

Approximately a quarter of women between the ages of 18 and 44 fill legal opioid prescriptions (Ailes et al., 2015). The combined effects of over-prescription of opioids among women of childbearing age, high rates of unintended pregnancy, and the interplay between pharmaceutical use and resurgences in heroin abuse (Kuehn, 2013) has resulted in record rates of fetal drug exposures. One report, using data from the
CDC Pregnancy Risk Assessment Monitoring System (PRAMS), indicates that nearly 50% of all pregnancies in the U.S. are unplanned as a mean estimate, with rates as high as 62 unplanned pregnancies per 1,000 women between the age of 15-44 in select states (Kost, 2015). Unplanned pregnancy co-occurring with medical or non-medical drug use creates a pathway for accidental fetal exposure during pregnancy.

No single substance exposure will predict development of outcomes such as loss of pregnancy, fetal mortality, maternal mortality, congenital anomalies, or neonatal addiction. Rather, during pregnancy, there is interplay between genetic factors, environmental factors, and dose-response relationships over time. The current standard of care in U.S. healthcare systems is for providers to advise woman whom are pregnant or whom are planning to become pregnant to avoid all exposure to tobacco, alcohol, and illicit drugs. Whereas the effects of alcohol use and smoking are well-established, the science of fetal development post-exposure to psychotherapeutics are less so, and virtually no research has explored the physiological effects of exposure to NSO class drugs and designer variants during pregnancy.

In the case of pharmaceuticals with legitimate medical use, The FDA classifies drugs by categorically assessing them within the framework of a pregnancy risk index, shown in Table 1-1. Category A is least risk to the pregnancy, and each subsequent category (B, C, D, X) signifies greater risk of harm to the fetus when evidence, if any, is available.

Prescription opioids with a single active ingredient generally fall into Category B, however, brands with multiple drug components are often listed at Category C. Popular benzodiazepines such as Xanax are currently classified in Category D, representing
greater evidence of known harm to a developing fetus. Other pharmaceuticals, such as anti-epileptic drugs, have been shown to significantly increase risk of congenital anomalies and as such are also rated in risk category D.

There are, however, major challenges when using this system to determine risks from exposure during individual pregnancies:

- Current classifications exclude science on genomic medicine and specific interplay between human genetic variation and drug classes that would change an individual’s risk profile
- Pregnancy risk categories do not differentiate between dose/response levels in any patient, to include time of exposure, degree of exposure, and issues of dependence or addiction that occur under medical supervision
- Pregnancy risk categories do not account for effects of withdrawal if patients abruptly discontinue use
- Administrative updates to pregnancy risk categories generally lag behind clinical research findings
- Transient fetal morbidity events are not often measured during clinical studies

Contemporary surveillance methods for birth defects exclude manifestations of withdrawal during the neonatal period after birth, conditions known collectively as neonatal abstinence syndromes. NAS and other conditions that are not classified as birth defects are termed here as transient fetal morbidities. Currently, NAS rates have risen in line with increased incidence in opioid use among the general population (Patrick et al., 2015). Presentation of addiction and withdrawal among neonates are estimated to account for up to 4% of all Neonatal Intensive Care Unit (NICU) hospital days nationwide and up to 20% of NICU days in select regions (Tolia et al., 2015). Due to this, NAS treatment raised associated healthcare expenditures exponentially higher than average costs of neonatal care (Patrick et al., 2012; Roussos-Ross, Reisfield, Elliot, Dalton, & Gold, 2015). Children impacted by NAS have an elevated risk of
Sudden Infant Death Syndrome (SIDS) and secondary medical complications during early developmental periods (Minozzi, Amato, Bellisario, Ferri, & Davoli, 2013).

The methodologies for surveillance for drug-related congenital anomalies are by nature of classification distinct from epidemiology of drug-related conditions at birth that result in transient fetal morbidities such as NAS and conditions with no detectable structural, genetic, or physical abnormalities. Public health practitioners and healthcare providers are only just beginning to understand how neonatal withdrawal impacts early childhood development, and few studies have examined the longitudinal effects of NAS using a life course perspective.

As one example, the Florida Birth Defect Registry (FBDR) is a state-based tracking system that serves as a satellite component to national surveillance systems at the CDC’s National Birth Defects Prevention Study. FBDR tracks reportable congenital anomalies that appear on a medical record. NAS is not recorded in a manner that the registry would be sensitive to due to its transient, non-structural presentation. This may skew medical and public perception of drug safety during pregnancy.

The potential risk of complications from maternal use of certain substances and various classes of drugs during pregnancy necessitates pregnancy risk elevation once exposure has been detected. The benefits of elevated and coordinated care are dependent on providers’ ability to effectively screen for substance abuse and misuse. Negative outcomes of high-risk pregnancies may, at times, be prevented or mitigated with advanced monitoring, intervention, and coordination of care from specialists practicing maternal and fetal medicine.
Effective Approaches to Drug Exposure Screening

Drug use and substance abuse screening enable providers to identify substance-related disorders in patients, assess additional risks to the mother and child, and plan treatment interventions. Although maternal misuse of drugs and substance abuse represent challenges to a healthy pregnancy, it is important that providers understand any maternal drug use can alter a maternal risk assessment. Certainly, fetal physiology does not discriminate between exposures that occur because of aberrant drug seeking behaviors or exposures that occur under legitimate use and medical supervision.

Exposure screening is practiced with varying levels of rigor in domestic healthcare environments. In some practices, screening of this nature is limited to a patient or staff-administered intake form designed to create a record of current prescription drugs the patient may be taking. This record is augmented by existing electronic or paper-based individual health records, and may or may not assess substance misuse and abuse specifically.

In other practices, a blood, hair, or urine toxicology screen is administered once or at intervals to detect exposures to different classes of substances. Toxicology screens and assays cannot often detect psychotherapeutic drugs due to their chemical properties that include short half-lives and relatively diminished presence in biological samples. Additionally, toxicology screens are often entirely incapable of measuring exposure to NSO class substances and other designer drugs due to unknown or novel chemical properties. Positive toxicology screens provide no information on patterns of use or exposures to patients during time periods outside of the screening tool’s specific window of measurement. Toxicology screens are, however, generally effective for
detection of marijuana use and certainly may serve as a cue for more comprehensive screening if test results deviate from other written or verbal means of detection.

Validated verbal and written substance abuse screening instruments are generally more comprehensive than intake-based screening and toxicology tests. The term validated, in this case, refers to psychometric and statistical measures of internal consistency, specificity, sensitivity, and predictive values of tests benchmarked during instrument development. Validated screening instruments such as the 4 P’s and a variety of self-administered and clinician-administered questionnaires are now readily available to providers.

ACOG (2017) notes that “screening for substance abuse should be a part of complete obstetric care and should be done at the first prenatal visit.” ACOG goes on to recommend that “routine screening should rely on validated screening tools, such as questionnaires, including 4P’s, NIDA Quick Screen, and CRAFFT (for women 26 years or younger).” ACOG’s recommendation for the use of validated substance abuse screening tools, although appearing within a specific call to action for opioid use and abuse, is in line with a more generalized SBIRT approach during provision of prenatal care that also explores alcohol, smoking, and other drug use by patients.

The 4P’s Plus, as one example (Table 1-2), were first developed for use by testing among a sample of 7817 women (Chasnoff et al., 2005). The purpose of the study was to examine whether past use of drugs and alcohol among a group of women correlated to current use of drugs and alcohol among the same group. The study identified three risk groups: low-risk women (no past use), average-risk women (past use, but not in the last month), and high-risk women (use in the last month). Notably,
whereas 1.2% of women in the sample undergoing toxicology tests screened positive for substances (total n of 17 out of 651 screened), 37% of the same women screened with the 4P’s scored positive on a comprehensive clinical assessment. The study concluded that verbal screening in a structured manner using the 4 P’s was superior to urine toxicology alone by a wide margin, as toxicology screening failed to capture exposures that were subsequently identified with the validated tool.

In another study (Chasnoff, Wells, McGourty, & Bailey, 2007), 228 pregnant women were screened with the 4P’s or the 4P’s plus via questionnaire administration by nursing staff and medical assistants. Following use of the screening tools, each woman underwent a clinical interview with more detailed questions about their patterns and history of substance use. The clinical interview was designed to confirm or reject the results of the 4P’s screen, and many women whom were considered to have a positive 4P’s screen were subsequently found not to have a pattern of substance abuse risk during the assessment, leading the authors to conclude a relatively low positive predictive value of the initial screen (36%). However, most woman (97%) screened as negative by the 4P’s were also found to be negative by the clinical interview, establishing a very high negative predictive value. In summary, pregnant women who pass the 4P’s fully are not likely to experience fetal substance exposures or have substance-related complications during routine prenatal care.

**Problem Statement**

Maternal and child health in the U.S. has been compromised by use, misuse, and abuse of drugs that include but are not limited to alcohol, tobacco, illicit drugs such as heroin, prescription opioid painkillers, and psychotherapeutics. Engaging in screening for drug use and substance abuse risks during prenatal care is a critical first step
towards prevention, intervention, surveillance, and treatment of associated fetal, perinatal, and neonatal outcomes.

Despite clinical policy statements by leading professional associations advocating for universal application of validated screening tools during preconception and pregnancy, research indicates that providers often do not implement screening as a routine part of prenatal care. Data from the Pregnancy Risk Assessment Monitoring System (PRAMS) indicates that over 20% of mothers in Florida reported that healthcare providers did not discuss how drinking alcohol and smoking could affect their babies, and nearly 40% of pregnant women reported that healthcare providers did not discuss the effects of illegal drugs (CDC, 2015). Beyond these proxy data, there are limited studies assessing providers' use of validated screening tools.

When validated screening tools are integrated into prenatal care, there is evidence of reduction of adverse health outcomes and exponentially decreased costs per pregnancy (Taillac et al., 2007; Goler et al., 2012). Integration of universal screening after this fashion has been demonstrated in health systems with top-down protocols and dedicated staffing in place. In Florida, as one point of contrast, there appears to be a high degree of variance in screening behaviors both within managed care settings and externally in independent practice environments. Variations in implementation that deviate from universal screening results in disparities in care.

There is critical need to understand providers' substance abuse screening behaviors in a way that may be used to increase implementation of a universal and validated approach. This knowledge would serve as an evidence-base for interventions to improve healthcare quality.
Current Study

This dissertation explores the personal, professional, and environmental contexts of substance abuse screening among healthcare providers practicing in the state of Florida. A three-part study was conducted consisting of a round of interviews with licensed midwives and obstetricians; a series of confirmatory factor-generation exercises assessing how experts in the field perceive screening behaviors among their peers; and a pilot survey assessing the preliminary psychometric properties of attitude as a latent construct among OBGYN providers.

This study was guided by an overarching research question: What factors influence providers’ substance abuse screening behaviors during provision of routine prenatal care in Florida? Specific aims of this study provided context and structure to the research approach.

**Aim 1.** To explore factors perceived by providers to influence their personal substance abuse screening behaviors.

**Aim 2.** To identify providers’ assessments of normative peer behaviors and triangulate findings from the first stage of research.

**Aim 3.** To test the internal consistency reliability of items relating to an emergent domain of attitude.
Table 1-1. Pregnancy risk categories.

<table>
<thead>
<tr>
<th>Pregnancy Risk Category</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category A</td>
<td>Adequate and well-controlled studies have failed to demonstrate a risk to the fetus in the first trimester of pregnancy (and there is no evidence of risk in later trimesters).</td>
</tr>
<tr>
<td>Category B</td>
<td>Animal reproduction studies have failed to demonstrate a risk to the fetus and there are no adequate and well-controlled studies in pregnant women.</td>
</tr>
<tr>
<td>Category C</td>
<td>Animal reproduction studies have shown an adverse effect on the fetus and there are no adequate and well-controlled studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.</td>
</tr>
<tr>
<td>Category D</td>
<td>There is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience or studies in humans, but potential benefits may warrant use of the drug in pregnant women despite potential risks.</td>
</tr>
<tr>
<td>Category X</td>
<td>Studies in animals or humans have demonstrated fetal abnormalities and/or there is positive evidence of human fetal risk based on adverse reaction data from investigational or marketing experience, and the risks involved clearly outweigh potential benefits.</td>
</tr>
</tbody>
</table>

Data sourced from the Food and Drug Administration (2008).
<table>
<thead>
<tr>
<th>Context</th>
<th>Narrative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents</td>
<td>Did any of your parents have a problem with alcohol or other drug use?</td>
</tr>
<tr>
<td>Partner</td>
<td>Does your partner have a problem with alcohol or drug use?</td>
</tr>
<tr>
<td>Past</td>
<td>In the past, have you had difficulties in your life due to alcohol or other drugs, including prescription medications?</td>
</tr>
<tr>
<td>Present</td>
<td>In the past month have you drunk any alcohol or used any drugs?</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>In the month before you knew you were pregnant, how many cigarettes did you smoke? In the month before you knew you were pregnant, how many beers/how much wine/how much liquor did you drink?</td>
</tr>
</tbody>
</table>

Data sourced from Chasnoff et al. (2005).
CHAPTER 2
DESIGN AND METHODOLOGY

Approach

Three sequential research studies were conducted to explore healthcare providers’ substance abuse screening behaviors. Each study was designed to be an assessment of the research question through a different lens, using different methodological approaches to create a working model of the phenomena under study. Together, these stages of research form a comprehensive and unified body of work that expands on our understanding of factors influencing substance abuse screening behaviors during provision of prenatal care in Florida. On a broader level, this research was formed to compliment the social and behavioral science literature and add to ongoing behavioral research within health systems.

All research activities were approved by the University of Florida Institutional Review Board, IRB 02, Gainesville Campus, under study Protocol #2016-U-0419.

The three aims of this dissertation correspond to each stage of research and were designed as non-probabilistic, non-interventional, and non-experimental descriptive studies with cross-sectional or prospective cohort designs. Pursuit of aim one and aim two of this study involved two independent groups from two distinct target populations: midwives and obstetricians. Aim three of this study made use of one sample from a target population of obstetricians in Florida.

Recruitment and Participation, Aims 1 and 2

Two independent samples were recruited for participation simultaneously during pursuit of aim one and aim two of this study. Samples were recruited from a population
of licensed practicing midwives in Florida and from a population of licensed practicing obstetricians in Florida.

Participants were first identified using chain referral sampling, also known as snowball sampling (Biernacki & Waldorf, 1981), by which contacts gained during the formative stages of this research were asked to identify other contacts in their professional network that fit each aim’s inclusion criteria. Inclusion criteria were broad, requiring only verbal confirmation of current licensure from each professional sub-group.

Doulas, nurse practitioners, medical administrators, and support staff were excluded from recruitment. Although members of excluded professions are often responsible for implementation of screening protocols, it is beyond the scope of this study to identify variance in behavioral constructs among all healthcare providers. Midwives and obstetricians were selected due to their role in providing continuity of care throughout pregnancy, their decision-making capacity, as well as their executive responsibilities coordinating care during a given pregnancy. Providers living outside of Florida and those whom were no longer actively practicing were also excluded from this research in order to better assess contemporary behavioral trends within a regional frame of reference.

In addition to referral sampling, purposive sampling was used as a method of identifying participants based on specific characteristics (Teddlie & Yu, 2007), to include association membership and geography. To sample in a way that captured expected geographic variance in perspectives and behaviors within the state of Florida, online search engines were used to query ‘midwives’ followed by a county identifier, as well as ‘obstetricians’ or ‘OBGYN’ followed by a county identifier. A list of prospective
participants and their offices were assembled for counties in both rural and urban areas across the state. Once compiled, two to three offices per county were contacted by phone or through publicly available e-mail addresses. Participants were also approached at an annual ACOG meeting in Florida that was attended for the purpose of capturing the views of providers within a clinical association network.

Following first contact, providers were asked to review the study consent document and were invited to ask questions about the nature of this research study. After discussion and signing, interview sessions were scheduled for those self-selecting into stage one, and contact information was collected for those self-selecting into a digital panel for stage two of this research.

In some areas, particularly rural Northeast Florida and Southwest Florida, no participating providers were identifiable through search engines. This finding supports pre-existing research (Hung, Henning-Smith, Casey, & Kozhimannil, 2017) indicating that some counties in Florida have no publicly identifiable obstetric services. When no providers’ offices could be identified in any given region, additional sources such as faculty lists from local colleges, staff lists at hospitals and birth centers, and contact information from regional branches of professional associations were used. In many cases, extended searches failed to identify providers in rural counties.

Approximately 50 OBGYN offices were contacted by phone and e-mail, of which 10 were referrals. Approximately 80 OBGYN professionals were approached at a regional professional meeting. Of the 130 obstetricians contacted, eight agreed to interview and four completed a full interview session. Seven agreed to participate in a digital panel and completed at least one questionnaire session. Total participation rates
for obstetricians matriculating into both interviews and digital panels from phone calls and e-mails was 8%. Participation rate from personal contact with OBGYNS at an annual meeting was 9%.

No annual meeting of midwives in Florida occurred during the recruitment period. Prospective participants from a population of licensed practicing midwives were sampled purposively based on region, drawing from publicly available directory information obtained through search engines and professional association webpages. Prospective midwife participants were asked to review the study consent form prior to scheduling an interview or self-selecting into the digital panel.

Approximately 80 midwifery offices were approached to discuss study details and inclusion criteria, from which four midwives agreed to interview and 10 agreed to participate in digital panel sessions. One participant was subsequently excluded from interviews due to lack of licensure in Florida. Of the 10 initial panel members, only one midwife completed a full digital questionnaire. Total participation rates for midwives for interviews and digital panels combined were approximately 5%.

No compensation was offered or provided to participants during this stage of research.

**Recruitment and Participation, Aim 3**

During pursuit of aim three, a cross-sectional design was used. Recruitment materials were first distributed digitally to a sample of obstetricians using purposive sampling methods through digital directory searches in each county of Florida. Additionally, a total of 60 prospective participants were approached for recruitment at an annual ACOG professional meeting one year after recruitment efforts for prior stages of research.
Forty offices were contacted by e-mail using an IRB-approved letter. From a total of 100 providers exposed to study materials, 11 completed a survey session in full or in part, contributing to a total participation rate of 11%.

Post-recruitment, members of the sample were provided a link to study materials hosted by Qualtrics Survey Software. A digital consent form served as a gateway to survey questions. Participants that voluntarily self-selected into this research and signed the consent form were able to access study materials immediately through the online portal.

No compensation was offered or provided to participants during this stage of research.

Data Collection, Aim 1

Interviews were recorded in a private setting using a digital recording device. The interview guide was semi-structured with a prepared series of questions and probes. An initial pool of questions were subjected to think-aloud cognitive review (Collins, 2001; Drennan, 2003) with two practicing obstetricians that had served as informants during research design. Both providers that engaged in cognitive interviewing were not included in the final sample of participating providers. During data collection, guided by principles of theoretical sampling consistent with an interpretive and constructivist approach (Glaser & Strauss, 2009), the context of each interview allowed for additional unwritten probes to be introduced.

The interview questions (Appendix A) consisted of open-ended items aligned to substance abuse screening behaviors, personal accounts of how participants came to use a specific method, providers’ perceptions of peer norms, perceptions of best
practice, and assessments of environmental factors that may influence behavioral initiation.

**Data Collection, Aim 2**

Immediately after recruitment for stage two of this study, participants were asked to connect to the study portal created using Qualtrics Survey Software. The informed consent document was reproduced as a required introductory question at the survey site, and a digital signature was collected that secured access to the study questions.

In contrast to the interview guide, which did not define or operationalize “substance abuse” for participants, panel participants were presented with the following definition of screening:

For the purpose of the following questions, screening includes self-administered and clinician-administered verbal and written tools such as the 4P’s, the 4P’s Plus, DAST-10, AUDIT, TWEAK, or any non-toxicological assessment used to detect substance abuse and dependence in a patient, including asking about substance abuse directly. This question does not explore factors influencing use of drug tests, lab-work, or biological assays.

Additional guidance was added to ensure that panel participants would frame their answers in a way that was clearly connected to the study aim:

When answering this question, consider why obstetricians may screen all patients, why they may only screen in select cases, or why they may choose not to use verbal and written substance abuse screening tools.

Following these instructions, participants were asked to list several answers to the question “What are the most important factors influencing providers’ choices to screen or not to screen a patient for substance abuse during prenatal care?”

Participants completing the first questionnaire were invited to a second panel round two weeks after the first session closed. The second round was likewise presented via the Qualtrics portal. Factors listed by participants during the first
questionnaire were transformed into statements and accompanied by a ranking tool. Statements presented for ranking are shown in Appendix B. The ranking tool consisted of a series of stacked vertical bars that could be changed from white to red by moving a cursor up or down. The number of red bars selected served as a score for each factor’s perceived importance. An example of the graphical ranking tool is shown in Figure 2-1.

In addition to this factor-scoring exercise, separate from the graphical tool, hypothesized factors introduced during the first stage of the panel were re-introduced in list format. These included factors such as “patient-provider relationship” and “time”. Using a drag and drop tool, participants were asked to rank the relative importance of each factor compared to other listed factors in a top ten list. This exercise was used to force a hierarchy of barriers and motivational factors. Figure 2-2 shows an example of motivational factors, prior to ranking, used for measurement with the drag-and-drop tool.

Data Collection, Aim 3

Upon accessing survey materials through Qualtrics Survey Software, participants were asked to answer 18 questions regarding their attitudes towards different aspects of substance abuse screening. Each item was to be tested to determine its correlation to other items and its contribution to a total score. Special focus was given to assessing construct validity through internal consistency of this pilot index.

The first series of eight questions revolved around experiential and instrumental aspects of screening attitude. These included questions about providers’ affective disposition towards the time it takes to screen; attitude about patient honesty; attitude about reimbursement for screening; and other questions as shown in Appendix C. Participants identified their level of agreement or disagreement with items on a 5-point Likert-style questionnaire. For most questions, answering one aligned with strongly
agree, indicating positive attitude, and five aligned with strongly disagree, indicating negative attitude. For questions that were reverse-coded, or stated negatively, a lower score indicated a comparatively negative attitude and a higher score indicated a positive attitude.

The second series of questions concerned participants' attitudes towards patient characteristics and their links to drug use and substance abuse. Characteristics that items were built around included variables such as income, insurance type, race and ethnicity, and patient behavior. A final question in this series assessed instrumental attitude regarding screening based on patient characteristics by asking "If a patient doesn't appear to be using drugs, obstetricians should not ask directly about drug use and substance abuse beyond an intake form."

The third series of questions revolved around participants' attitude towards environmental aspects of screening. Participants were asked to evaluate statements on whether association guidelines and state law should dictate how to screen, and if aspects of the practice environment such as computerized reminders would help obstetricians screen effectively. Several of these questions were removed from analyses following post-test feedback from participating providers.

Participants were then asked to identify their current substance abuse screening behaviors via multiple-choice checkbox. Lastly, they were asked to enter a brief text description of their personal screening behaviors. The purpose of this final exercise was to determine if participants' description of their screening approach aligned or did not align to publicly available substance abuse screening instruments, such as the 4P’s,
and to capture behavioral variations that may not have been covered in the multiple-choice selections.

**Methods**

**Grounded Theory Analyses**

The perceptions and self-reported behaviors of health professionals used as data in this stage of research occur within a diversity of health systems in which elements of organizational culture were expected to shape providers’ approach to service delivery. The utility of grounded theory to explore abstract constructs contextual to the organizational cultures in which these behaviors occur was essential not only for generating theory but for maintaining a rigorous sense of methodological inquiry and structure during this qualitative approach. Grounded theory facilitated engagement with providers that would serve as the source, subjects, and intended audience of this study, permitting each research component to become collaborative and emergent sequelae of the initial questions.

The seminal grounded theory study, conducted by Glaser and Strauss (1966), examined death and American’s cultural reactions to death. During this period, grounded theory methodology had yet to be formally outlined. The discovery of grounded theory (1967) would subsequently detail an approach to systematically generating theory from qualitative data. As a novel-theory generating tool, grounded theory was explicitly designed to “forestall the opportunistic use of theories that have dubious fit and working capacity” to comprehensive problems in social science. In other words, to prevent force-fitting data to external theories due to their popularity or accessibility.

Central to a grounded approach are the following key strategies:
Identifying deductive, conceptual properties of phenomena abstracted from data

Defining and generalizing abstracted domains

Revisiting original data in the context of their contribution to latent structures, and subsequently revisiting latent domains in the context of new data, making “distinctions between category and property” (Glauser & Strauss, 1967)

Theoretical sampling techniques based on distinct relevance, tying data analysis to continued data collection

Expanding theoretical concepts in terms of temporality, structure, and generality

As a matter of heuristics, Corbin and Strauss (1990) outline a discrete set of coding exercises which are repeated in these analyses. In some respects, however, the approach taken during this current unified study branches from a fully grounded approach to analysis.

Interview sessions were recorded in Mp3 format using a portable digital recording device. Each recording was transcribed verbatim and entered into QSR International NVivo 11, qualitative data analysis software, per Richards (1999).

Data were first coded line by line with brief descriptions of participants’ thoughts, statements, and actions. In some cases, lines of data were coded as they were, with the language of the participant serving to define the coded line, described as “en vivo”, per the software tool. Prior to each code, a participant marker was inset into the line with a number and a signal of professional class (MW for midwives and OB for OBGYN).

Line by line coding was followed by open coding, an interpretive process of identifying trends and themes appearing across interviews, then aggregating codes by theme as opposed to participant. During open coding, emergent factors were identified and grouped.
Axial coding exercises were conducted in which code groups were re-examined through constant comparison and relationships between the code groups were charted more extensively than the surface level relationships revealed during open coding. Themes were viewed with an eye towards how they may coalesce to form a picture of the behavior under study and how they may speak to phenomena in the greater field of midwifery and obstetrics.

Special attention was given here to the norms expressed by participants, the setting of each interview, and the ways that broad themes varied in terms of their properties. For example, although two participants may express a statement about providers' bias towards patient groups, the directional effect of the bias among each participant may in one scenario provoke substance abuse screening (positive directional effect) yet in another prevent substance abuse screening (inverse directional effect).

Selective coding (Corbin & Strauss, 1990) is traditionally used to form a theory of behavior around a central theme. Whereas no single participant-identified factor emerged as a core explanatory construct during this process, A final practical model was created demonstrating relationships between three over-arching thematic domains. These core selective codes sprang from the words of participants in the original data and were further refined through constant comparison at each stage of analysis. Operational model diagramming, per Saldana (2012), was ultimately used as an output of theory elaboration.

Confirmatory Questionnaire Analyses

A series of confirmatory factor-generation exercises were conducted via two digital questionnaires, answered in succession by a single cohort of participants at two different points in time. Panel construction was inspired by the Delphi method of
consensus building (Dalkey & Helmer, 1963; Keeney, McKenna, & Hasson, 2011).
Distinct from the Delphi method, the purpose of this approach was not strictly to build expert consensus around the research question, but rather to evoke responses that would triangulate interview data and add reliability to them. Additionally, this approach was used to mitigate the effects of social desirability bias on questions relating to providers’ behaviors, providers’ bias towards patient characteristics, and views on drug use and abuse that may not be in the mainstream.

In this stage of research, conventional qualitative content analysis (CQCA) was used to explore the panel’s initial input, which consisted of lists of factors that were perceived to influence peer screening behaviors. Participants’ responses to open-ended queries were coded according to the way they were expressed within these data. In this respect, use of CQCA was comparable to line-by-line “en vivo” coding strategies. However, distinct from the rich text generated during stage one interview sessions which enabled open and axial coding to occur, most responses in this stage of research did not appear in narrative form. Rather, they appeared as lists from which codes could be generated directly.

Text entries were first organized into verbatim code groups. When participants justified their response with additional writing, adjustments could be made to code names that enabled more precise grouping by theme. CQCA analytical techniques were employed in part due to the absence of researcher-participant interpersonal rapport by which probes could be generated or unclear statements explored verbally.

The number of times each factor or a variation of a factor was independently reported by a participant was tabulated, and a frequency table was compiled. In addition
to generating a count of each time factors appeared independently across participants, each theme was explored in terms of their hypothesized directional effect on screening behaviors.

Due to an extreme rate of study attrition among midwives, only a single member of this professional class completed the first-round questionnaire. As such, no count or frequency measure was used for analysis. Rather, data from the midwife was reported as it was collected, in nominal form.

During the second administered questionnaire, codes generated previously were subject to ranking in terms of their expected influence, much as they would be in a traditional Delphi or e-Delphi panel (Keeney, McKenna, & Hasson, 2010), using a Likert-style measure. The degree of each item’s influence on substance abuse screening was categorized as low, medium, or high based on the sum scoring of responses. A summative score of 0 to 11 was rated as low, a score of 12 to 20 as moderate, and a score of 21 and above ranked as highly influential.

As a final exercise, participants ranked each domain relative to others, manipulating a list of 10 behavioral barriers to implementation of validated substance abuse screening tools, as well as 10 facilitators or positive motivational factors influencing screening. The top three barriers and top three facilitators identified by the panel were subsequently reported as key findings.

**Pilot Index Analyses**

Prior to item construction, indices from the literature were studied for relevance to measurement among this sample. Several measurement strategies for attitude as a multi-dimensional construct were found. For example, development of the Substance Abuse Attitude Survey (Chappel, Veach, & Krug, 1985), validated among samples of
medical students and clinicians, identified five dimensional aspects of providers’ attitude regarding substance abuse. These included permissiveness, treatment intervention, stereotypes, treatment optimism, and moralism. The resulting instrument measured broad attitude about substance abuse as opposed to specific attitudes mediating or moderating clinical behaviors. This study provided supportive evidence of a multi-dimensional attitudinal domain constructed from conscious affective positions as well as more subtle perceptions and beliefs about substance abuse.

In a study of primary care residents in the field of geriatrics (Reuben et al., 1998), attitude was quantified via 37 Likert-style items heavily influenced by Maxwell & Sullivan (1980). Fourteen final items were validated for use by comparing the instrument’s item total correlations to alternate indices in a test of concurrent validity among the sample. Like the Substance Abuse Attitude Survey, the Geriatric Attitudes Scale proposes a dimensional framework for attitude that is composed of broader affective positions about a population as well as outcome-based evaluations about provision of care. For example, “taking a medical history from elderly patients is frequently an ordeal” is presented as an equal measure of attitude with “most old people are pleasant to be with.” The former item regards a specific clinical task, whereas the latter item speaks to an affective position of a provider towards a group. Both were proposed as equal measures of a latent attitudinal domain within the final set of measures.

Among the broader maternal and child health research literature, the Neonatal Palliative Care Attitude Scale (Kain, Gardner, & Yates, 2009) uses 26 Likert-style items that also offer multi-dimensional interpretations of attitude. Three factors were validated that informed the latent domain, including organizational factors (a sum of items
concerning individual perceptions of barriers and facilitators to palliative care practice among nurses), resource factors (a sum of perceptions about the clinical environment and its role in supporting palliative care, to include policy and time), and clinician factors (a sum of items about the care team and their supportive or non-supportive influence on provision of care). Results indicated that attitude may be transposed as a quantitative variable with items about perception, affect, and clinical behavior representing equivalency of measurement to a total item score representing a latent domain.

In this current pilot study, new items were generated based on emergent aspects of attitude discovered during interview sessions and throughout the confirmatory panel sessions. Items from the literature were not used in their entirety due to the unique context of this research and the content-focused nature of pre-existing measures.

Statistical methods nested in classical test theory were used to assess the properties of the index. Inter item correlation, a measure that assesses the fit of each item in relation to other items through their covariance (Viswanathan, 2005), was the first test conducted. Due to small sample size and no assumption of normalcy, Spearman’s (1910) correlation coefficients were generated as non-parametric assessments of these data.

Following this, item total correlations were conducted by calculating a total score from each participant’s input and quantifying the degree to which performance on an item may be linked to performance on the entirety of the pilot index. Cronbach’s Alpha (Cronbach, 1951; Cronbach & Meehl, 1955) was generated as an indicator of internal consistency reliability. These assessments, combined, provided the basis for inclusion or exclusion of individual items.
Figure 2-1. Confirmatory factor-ranking tool.

What are the most important motivators for substance abuse screening during prenatal care?

1. Patient race and ethnicity motivates screening
2. Office policy motivates screening
3. Cues to action, such as electronic reminders, motivate screening
4. Training motivates screening
5. Professional practice association policy motivates screening
6. Concerns for maternal and fetal health motivate screening
7. Poor screening behavior motivates screening
8. Mentor screening behavior motivates screening
9. Other patient factors (family status, income, signs of abuse, etc.) motivates screening
10. Law motivates screening

Figure 2-2. Listed motivators to substance abuse screening.
CHAPTER 3
RESULTS

Exploring Substance Abuse Screening Behaviors with Grounded Theory

All participants interviewed in each sample acknowledged a base level of screening, either through patient self-report on a form or staff and physician-administered intake forms. A key finding of this study is that no single participant explicitly identified universal implementation of validated, standardized psychometric screening instruments when screening for drug exposures and substance abuse with patients and clients.

When providers identified participating in any screening activity that exceeded paper-based or electronic medical record (EMR) intake forms, with select patients or with all patients, verbal screening tended to be improvised or learned by training with a non-standard approach. Providers also expressed preferences, at times, for use of toxicology screening tests. Toxicology screens were discussed as a standard of detection in the field, which contrasts with research highlighting the general insufficiency of toxicology screens as a stand-alone tool.

This study finds that practicing midwives and practicing obstetricians in Florida share many common factors that influence substance abuse screening. However, the way each professional group performs screening behaviors and the strength of factors proposed here varies considerably. The categories of influence align, whereas their properties are dynamic among the samples.

Core coding categories and themes emerging from these data (Figure 3-1), are motivational factors, both intrinsic and extrinsic, that as a parent domain include screening origins and other learned influences. Environmental factors include
professional practice environments, as well as the influence of healthcare systems on providers' behaviors. Attitudes, both instrumental and experiential, are subsequently informed by knowledge, beliefs, and personal experiences. These three domains appear to influence each other often, a relationship modeled as reciprocal determinism and visualized in Figure 3-2.

**Core Themes**

**Motivational Factors**

When providers have not implemented a universal screening protocol, their behavior beyond paper-based and EMR intake forms presents as a dichotomous variable: performance of screening through use of a validated tool, or no performance. Intrinsic motivational factors are those that are hypothesized to have a positive effect on providers' choice to screen. Certain motivational factors appear to have an inverse relationship when they are absent, yet otherwise sustain and facilitate the behavior. These are termed extrinsic motivational factors. The sub-components of motivational factors proposed in this stage of research include screening origins, patient cues, and providers' evaluations of patient cues.

**Screening origins**

Screening origins are proposed as a sub-domain of motivational factors. Screening origins are defined as formative moments of practice that provide information on how a provider came to use their routine screening method as well as personal motivations. For example, both midwives and obstetricians identify their concern for maternal and fetal safety, as well as their desire to positively influence birth outcomes, as a primary origin-determinant to substance abuse screening. As noted quite succinctly by a midwife:
MW3: My responsibility is to get this baby on this planet as healthy as we possibly can.

Modern midwifery provides care for clients whom are seeking a guided out-of-hospital birth. Although there are cases where midwives practice in integrated hospital settings and broader clinical environments such as mixed obstetric facilities, all midwives in this sample practiced exclusively in private offices. When midwives consider maternal and fetal safety, they are assessing the appropriateness of delivery in a private care setting without the tools of emergency medicine. When the result of a risk assessment or screening tool elevates pregnancy risk, it is a red flag that challenges midwives’ ability to guide a safe out-of-hospital birth:

MW1: I want to make sure that they're in a safe place for themselves and the baby. And obviously, they might be okay, but how are the drugs affecting the babies? So, I might not want to deliver the baby.

MW2: If somebody is using a substance in their pregnancy, it affects their ability to have an out-of-hospital birth safely.

Concerns over maternal and fetal safety are also shared by obstetricians as intrinsic motivational factors:

OB1: It is just good practice. If somebody's on medication then you need to know also for prenatal care. So it's for the mother and the baby.

Education and skill-training are additional formative components of behavioral initiation that were coded as motivational screening origins. Simply stated, what midwives and obstetricians learn during medical school, residency, and mentorship have lasting effects on their approaches to patient care. Participants noted that they engaged in universal screening because they were trained to ask every patient a certain way. However, behaviors that are learned do not always align with best practice
guidelines. Disparities in screening based on patient characteristics are passed on during training:

**OB4:** When you're in residency, you don't usually work with a very indigent population... we had people that come in and they're private insurance, they were referred. And so we were kind of taught you don't ask them these questions... They have private insurance. They're not doing this... it was an aspect of your training not to push hard on exceptions to these questions.

**MW2:** I feel like in my schooling we talked about it a few times over the three years in different classes. Your pharmacology class, of course, you talk about it just in what those drugs can do. You talk about it in your practicum classes when you're learning health assessment and things. In your health and care skills classes, you talk about it. So I do feel like it was definitely taught in a way that made us feel like it was important

Origins are also informed by guidelines and regulations. Specifically, midwives' use of standardized screening assessments at intake are reinforced by regulation set forth by the state of Florida as a component of licensure. Use of the Florida midwifery risk assessment form, which is a client-intake method of screening, is subject to regulation and audit that reinforces midwives' standardized approach.

**MW1:** It's part of our law. We have to do the risk assessment for every patient and we do it throughout the pregnancy... if we get audited, that's one of the things they'll look for, to see if we have that... So we have two midwives, myself and another one, and we both have to use those if you're licensed by the state. We have to do the risk assessment for every patient and we do it throughout the pregnancy.

Obstetricians, in contrast, do not report being influenced by Florida law, but do report being influenced by clinical practice association guidelines published by ACOG.

ACOG's official policy on universal screening is a collective statement, formed by committee, providing evidence and endorsement for validated substance abuse screening tools. Notably, even providers who reported being motivated by ACOG guidelines were not able to identify a specific recommended screening method or a
particular survey tool. For example, most obstetricians interviewed understand that ACOG supports screening all patients, and they assume compliance if their practice logs a physical or digital social history form at the first prenatal care visit. Providers report being aligned to best practice guidelines even when their own descriptions of screening behavior differ from those guidelines in a substantive way:

OB2: I follow, a lot, what ACOG recommends, or I would like to think that I do. Having joint people, joint organizations support a particular screening tool, I think it’s very helpful. I mean, I think that both ACOG at the national and the local level-- I think the state level would be helpful. And certainly, throw in the CDC in there too. Everything together would be better

OB4: Well, I usually try to follow the guidelines, and they say to screen everybody, so—

OB5: It doesn’t have a name or anything like that. we want to ask about additional problems: alcohol, any medications or drugs, opioids, “For the good of the baby I’m just wondering if you are taking anything... or if there is anything else you want to discuss with me”

**Patient characteristics and provider bias**

Providers report being motivated to initiate screening behaviors beyond intake based on patient cues that act as triggers, leading to suspicions of drug use that in turn prompt more comprehensive investigation into the history and extent of exposure. Patient-cued screening is a philosophical opposite to universal screening, and one that is self-justified by both midwives and obstetricians based on their experiences in the field.

In order for patient cues to lead to screening, the provider must first believe that a patient’s presentation makes them more likely to use drugs. In many cases, a provider may have a hunch that a patient is hiding something or otherwise not disclosing information pertinent to their care. A secondary assumption underlying patient-cued screening initiation, beyond perceptions of demographic and behavioral links to
substance abuse, is a belief that providers can tell which patients are using drugs and which patients are not using drugs:

Ob4: At this particular practice, I haven't had a patient that it looked like there was something wrong with substance abuse.

Some providers do not believe that drug use and substance abuse can be present in an otherwise standard patient. Psychologically, to some providers, individuals challenged by substance abuse are the other: a certain type of person that is different from the patients they know and care for.

MW3: No, I don't see that population. That kind of population, in my group, doesn't show up. They're not going to even be there. They're just not even going to be there… They're just not going to be that type of clientele.

OB3: I feel like I have a very good relationship with all of my patients and I feel like I would know.

Due to the personal nature of these cues, they are heavily influenced by providers' biases. Yet it is important to note that bias is not the only factor informing and motivating patient-cued screening. Providers feel it is necessary to follow up with rigor on patients who are physically or behaviorally showing signs of drug use, and there is a professional obligation to pursue elements of a patient's presentation that may affect the pregnancy:

OB4: Some patients, they really get defensive… Those are the ones that I say get sent for a drug screen.

MW2: I guess I would look for any physical markers of drug use. Things like if they were using the opiates they would have poor weight gain most of the time or poor appetites. I would see they were a lower weight. They may look like-- a lot of the times people who are regular users tend to be a little more rundown than non-users. Things like jitters… I've had clients before where they couldn't make eye contact with me and talk really fast to the wall behind me, and then that tips me off that there might be something going on. Things that are a little outside of the normal social behaviors of people, and that could tip me off to either substance abuse or mental disorders.
OB2: Not coming to the appointments when they're supposed to come, and
then, maybe, not giving us a good a reason why they're not coming.
Missing several appointments in a row, it's a trigger many times to us to
kind of wonder what's going on. So many times when they are not
following the natural course of visits, that makes me start thinking, "What
is there--" besides ruling out the possibility of transportation problems, it
starts raising some questions. And basically, the conversations that we
have in the office, when they come in for their appointments, what are they
giving more importance to in the visit? I know it's not very structured - what
I am discussing here with you - but I do use that as my screening tool.

The transition to bias occurs when the decision to screen becomes motivated by
population-based characteristics as opposed to individual presentation. Some midwives,
for example, believe that if patients are seeking their care at all that they are unlikely to
be abusing drugs:

MW1: The clientele that I generally work with are generally not going to be ones
who are using drugs. They want a little bit more for their pregnancies and
for their deliveries. So on the whole, they're not going to be the ones who
are abusing substances, who have substance abuse. So we're a little-- an
OB is going to see a wide range of clientele, wide range of risks.

OB4: I think the biggest thing is probably patient characteristics

MW3: If they can afford my services, they don't

Participants noted that they suspect other providers rely heavily on a similar
approach:

MW2: In my experience so far, I feel like the check box and profiling are the two
tools that midwives use in general.

Furthermore, as noted in discussion of screening origins, some obstetricians will
not screen beyond intake based solely on patients’ insurance type, resulting in
increased screening for uninsured patients and patients on Medicaid and less screening
for patients with private insurance. In this particular case, code-overlap also occurs with
insurance type as an environmental component of behavioral influence.
**Environmental Factors**

Environmental factors include clinical policy and protocol, practice setting, and other parts of providers’ day to day work structure that precedes, facilitates, or acts as barriers to screening initiation. In some ways, environmental factors are sister-codes to motivational screening origins. Distinction is made in this case between the domains based on context and temporality. Screening origins delineate factors that form the screening approach, and environmental factors speak to more acute influences on behavior from a process-oriented health systems perspective. These include administrative aspects of service delivery, inter-office protocols, and organizational influences.

One of the single most widely-reported environmental impacts on screening behaviors during day-to-day practice is the nature of content on risk assessment forms, patient-intake forms, social history forms, and other hardcopy or EMR records. Intake forms are typically standardized in an office setting, used jointly across professionally-linked groups or hospital practices, and may be part of office policy in health systems with brand-influence over multiple practices.

In the case of midwives, risk assessment forms are part of their regulatory environment. In the case of obstetricians, the forms are generally not mandated, or at least are not perceived as state-regulated by interview participants. Forms were reported to be a procedure that is integrated with their inter-office workflows.

Participating obstetricians did not independently express knowledge of the form’s origin:

**OB1:** I screen all my patients, OB and GYN. When we do the history-- in the history, when we ask about the social substance abuse, basically it goes like, “Do you smoke? Yes? No?” And if they say yes, then we ask, “How much? For how long?” And the next question is, “How about drugs?” And
if they will say no or yes. If they say no, then move on to the next thing. "Alcohol?" If they say yes, then "What do you use, and how often?"

OB2: It's like a checkbox. I feel like substance abuse screening in our practice is limited many times in the prenatal record to that first visit, where the patient will come in and we will ask them if they use any substance. And basically, if they deny it at that point, unless they have some behavior during the prenatal course that makes me suspect that I should be more inquisitive about that, they will not get screened again. So there's that initial prenatal visit where we go through all the questions that are asked, related to all the medical conditions and problems that they may have, and there's a section that will ask following the smoking questions and the alcohol

OB3: Alright. So we have a handout that we hand to--for pregnant patients, we have a handout that questions patients on their history and their partner's history. And part of that questionnaire involves any drug use or any alcohol use.

Environmentally, obstetric clinical practices also differ from midwives by the effects of time on screening. For obstetricians, limited time with patients throughout the pregnancy, exacerbated by sheer volume of patients, leads to an environment where asking about drug use and substance use becomes an issue of prioritization against competing aspects of patient care.

OB2: you have to move on, and you feel like you're not being totally in there for that patient. So that's very frustrating for us as providers because I want to do more for her, I want to try.

OB3: It's just time. Time constraints are always the biggest issue.

In contrast, participating midwives did not report time as an environmental barrier to screening.

All participating midwives in this research practiced in private settings set up for prenatal care and, in some cases, for birthing. Midwives did not report on variations in practice environment as an influence on their own behavior. Obstetricians, on the other hand, reported changes in screening based on practice setting. Participants suggested
that more comprehensive screening occurred during residency in a hospital
environment, whereas less screening occurs in their private practices.

OB3: In residency you don't see the patients maybe more than one or two visits. They're kind of constantly changing who they see. You deliver people that you've really never met before. You see them in the ER, you ask them real quick. We did a lot more drug screening ((toxicology)) in residency also. And so you'd find out things.

OB4: Well, I'm at a hospital-based clinic. So, actually, our NT, our mental assist, and our nurses are-- they're required to ask every patient.

OB2: As you get into a comfort zone of being in private practice, I think you are not as effective. I know we're not as effective in picking up everything

This type of variation in behavior based on office type also speaks to control over screening. In a private practice setting, the provider may play a role in administration. As such, they are tasked with designing elements of their own workflow and making decisions about what otherwise may be seen as procedural aspects of care in a larger health system. In some cases, they improvise:

OB1: I think it just came out on my own. I designed my own my history form when I went in practice basically based on how I always was asking the questions in a particular sequence… I've been asking same questions for years… It's my routine.

An additional environmental component of screening revealed by both groups of providers are considerations of patient privacy that arise when family members and spouses co-attend prenatal care visits. Lack of patient privacy changes the way providers engage in screening in several ways:

OB2: they bring their kids. All the visits are like that. It's a family affair many times. So the mother can be there, their father can be there, their grandfather… That changes the dynamics of the visit... And we have patients-- you know how it goes for an STD, "Let's talk about that before my husband comes into the room because I don't want him to know I've had this thing," and I said, "Okay." So the same would go with substance abuse and with everything if-- but sometimes, we don't even have a
chance because the family just kind of pops in there, and so it's more like a social, fun visit.

MW3: As like other parts of medical history that they seek not to divulge to you. And I've had clients who've done that, telling me they're on their first baby, and it turns out that they've had two babies they gave up for adoption. But they didn't want their partner to know that. So they're sitting there with their partner next to them, and I always gave them the opportunity later on. I'll say, "All right, the partner needs to just sit in my living room, and you just come back in my office. And let's just go over all this to make sure that we're all on the same page.

OB3: I mean, I guess, if I have a teenager and the parent is in the room, I'd have to have the teenager alone.

OB4: It really depends on the patient. When I'm talking to a teenager my vernacular changes, everything changes.

OB5: When the husband is in the room, it changes the way she is going to answer. But you ask anyway, and they glare at you, and then you find out later that they don't want you as a doctor anymore, but you have to ask anyway because you need to know.

Patients' insurance status appeared previously as a code linked to patient-cued behavioral initiation. Insurance status also appears to manifest as an environmental factor:

OB2: I think in part of our situation in our practice - and I assume that it will be a big change - is what your patient population is and how the different medical insurances, that will change a lot how aggressive you are in looking for substance abuse...the Medicaid population utilizes the system more. They come more for appointments. You have sometimes more chances of picking up on problems because they see utilization of a medical service as something that they don't have to pay for it as much.

Psychological Influences

Attitudes towards screening for drug use and substance abuse are considered theoretically in this model as a sum of positive, negative, and neutral instrumental and experientially formed feelings. Parallel to this domain are overlapping psychological influences: providers’ beliefs and providers' knowledge. All three contribute to an
internal narrative that shape providers’ understanding and interpretation of a patient’s presentation during routine prenatal care.

Instrumental attitudes were apparent by the relative importance each participant placed on screening, their descriptions of personal routine screening practices, and their stated beliefs in screening effectiveness. When a provider consistently initiates comprehensive screening behaviors beyond intake forms, has knowledge of and places normative importance on guidelines, and believes that screening will lead to better pregnancy outcomes, they may be said to have a positive attitude towards screening. Therefore, they are presumed to be more likely to implement validated substance abuse screening tools when the right conditions are met under a binary performance paradigm and in the absence of universal screening.

Alternately, providers that are dismissive of screening, believe that patients will not tell the truth, skip verbal asks in preference to toxicology screens, and feel guidelines are unimportant may be said to have negative attitudes towards substance abuse screening.

Aspects of attitude that include perceptions about patients’ honesty are mixed in with providers’ perceptions of the screening method itself.

MW2: I have far too many patients in my practice that are trying to kind of stay out of the system. They don't want to be like a number on a statistic sheet somewhere, and I find that they are a little dishonest on their paperwork that's on the Internet then they are verbally to me.

Which, in this specific case, led to a negative position concerning intake screening and a positive disposition towards validated verbal screens. These attitudes appeared to be influenced based on the expected utilitarian and instrumental outcomes
of intake screening. Other providers had clear positive or negative instrumental positions around different types of screening methods.

MW3: I made them aware that I was going to random drug test them. I wouldn't tell them, but I check their urine every time they come in anyway. And I said, "I'm going to random drug test you once every trimester, and if at any point you ever trigger positive on the drug screens that I do, you will be immediately transferred out of my care because I don't care to do that."

OB4: most of the time when you use the forms that they give you and you get so many no's. And then things come up. Like I had a patient who told me, "No, no, no, no, no" and I wrote her a prescription after surgery, and the pharmacy called me and said, "Do you know she gets 65 of Oxy every month on the 1st of the month, every single month?"

Experiential attitude or general affective feeling towards screening behaviors also were apparent during interview sessions. As one obstetrician noted when asked about clinical practice guidelines:

OB1: I have not dwelled too much on that... protocols only come down from the top. So I don't see these in the protocol... all you're doing is asking a question. If they have a problem, they'll lie and say nothing.

Some experiential attitudes of screening are byproducts of the lens of the researcher, occurring between the lines of transcription. For example, the same participants that seemed reticent to offer personal information about screening behaviors, answering with a yes or no, and who were otherwise unresponsive to probing questions also tended to have a negative disposition towards substance abuse screening. No quote is available that appropriately relates to these nonverbal interactions, yet they inform the domain of attitude as a behavioral influence.

It is important to note, however, that even openly-disclosing providers were influenced by factors that prevented guideline adherence. The effects of experiential attitude on screening initiation are variable and contextual, moderating behavioral intent to screen in confluence with other major domains.
A Confirmatory Approach to Understanding Factors Influencing Screening Perceptions of Peer Behavior

Categorical themes generated from panel-submitted data and their respective frequencies are reported directly in Table 3-1. Attitudes and beliefs, time, cost, and a lack of knowledge about community resources were introduced most often by panel participants interacting with a digital questionnaire. These data were often introduced in slightly different ways by panel participants, using slightly different language, and with different written justifications of how each factor was perceived to influence substance abuse screening behaviors among obstetricians in the field. Due to the dynamic presentation of multi-count codes, the content could be unpacked and aligned in terms of category and property. In some cases, specifically where factors were presented by a single participant only, as well as in cases where no justification for the entry was provided, content was recorded verbatim and not subjected to deeper interpretation.

Attitudes and beliefs

Providers’ attitudes and beliefs about substance abuse screening were perceived to influence substance abuse screening behaviors by 72% of panel participants. Attitudes and beliefs includes statements that address how providers’ view the outcomes of substance abuse screening, whether it is a worthwhile use of time, and if it provides them with information critical to upholding maternal and child health that would be relevant to their role in pregnancy care.

For example, one provider noted that “performing screening might unduly upset this delicate relationship…the physician-patient relationship.” When an obstetrician believes screening will affect their ability to provide care or have an effect on their ability to continue to serve a patient due to changes in the patient-provider relationship, then a
value judgement against universal screening has occurred. Likewise, if providers believe that patients will suffer stress from a substance abuse screen, and if the data derived from a screen is less important to the provider than their assessment of its effect on patients, then they may refrain from screening entirely.

Another participant wrote: “Concern that the patients who abuse drugs will not answer the questions truthfully so the time spent on questioning a patient is wasted… patients will not stop using, so why even try?” Here, there is an assumption on the provider’s part that substance abuse screening tools lack sensitivity. This belief is tied into an attitude that patients do not voluntarily disclose challenges with abuse – concerns that were echoed among other panel members:

P6: Belief that patients won’t be truthful about use so why bother
P7: Frustration – patients don’t want to be referred. Patients are in denial.
P4: I screen 100% of my patients. It is the practice pattern of my entire group. Many of my peers do not. I believe that they do not screen as they do not really wish to address the issues of a positive drug screen.

**Time, cost, and billing**

One factor that was expressed commonly was the variable effects of time on the screening process. However, time in this context is not simply the sum of the minutes in a patient’s appointment over three trimesters, it is a variable that includes increased patient loads and competing medical priorities during a clinical appointment.

P1: Time: Since OB is billed globally there is significant pressure to see many OB patients in a very small amount of time, so engaging on more complex topics is hard.

Another panel participant noted briefly: “… in a busy private practice, time is money.”

The relationship between time and reimbursement was presented in different ways, including time as a direct proxy of cost with known quantity, as well as time and
cost as unknown quantities when referral networks or treatment options are not clear to the provider. Concerns about time and cost issues were perceived to effect peer behavior by 57% of participants.

P1: Cost – some people might be concerned over what the cost of screening will add

P2: Resources: there are limited community and hospital resources related to substance abuse, and so because finding/utilizing them is difficult many doctors don't want to start a process that they know is going to take significant time and is unfamiliar to them

P2: Lack of reimbursement for inpatient management: often an inpatient stay related to drug use/transition to buprenorphine/methadone or detoxification/addiction is not reimbursed. We are under pressure from hospitals to discharge patients quickly before managing the social issues that contribute to addiction

**Challenges referring for treatment**

Several panel members expressed that a perceived lack of community resources decreased their intent to engage in screening. In Florida, at this time, a general practice obstetrician with no psychiatric specialty training would be unable to engage a patient with opioid-agonist therapy treatments. Therefore, their ability to act on a positive screen was perceived to be dependent on their ability to navigate the patient to care:

P3: If you get a positive response, not having a standard response or referral system in place. The community may have limited resources available to treat substance abuse.

P7: 211 – not answered.

**Knowledge and training**

Several participants expressed concern that their peers in the field did not have adequate training, and that the experiences gained from training would influence the ability of providers to screen effectively. Along the same lines, a lack of exposure to the
tools may contribute to a lack of understanding of how a validated instrument may differ from a non-validated series of questions:

P2: Knowledge on topic: many OBs have not had formal nor recent training on substance abuse and may not see it as part of their clinical role

P3: The OB feels they do not have the training to adequately manage the substance abusing pregnant patient.

**Legal concerns**

Perceived legal issues of two different natures emerged as panel-identified influences to screening. The first was expressed as a concern that providers would be held responsible for “bad outcomes” if they screened and discovered substance abuse challenges but were otherwise unable to manage the patient in a way that prevented adverse fetal outcomes:

P1: we should not be held responsible for bad outcomes that may be due to maternal behaviors

P3: Medical legal ramifications about knowing about substance abuse in the pregnant patient and not doing anything about it. Is the OB liable for a bad outcome? Is it better just to not know?

Another participant identified legal issues for the patient as a concern. If a positive screen occurs and it is found that the exposures are linked to abuse, the provider may be required to report to a child services agency. This, in turn, may trigger unintended consequences for the patient, such as removal of the child from the mother, as noted verbatim:

P1: Legal concerns - positive results might impact a woman’s legal status as well as her custody of her child

**Maternal and child health**

Maternal health and fetal safety were reported to have a positive influence on screening behavior during prenatal care. Maternal and fetal safety were reported in
direct, simple terms, with one participant writing “it is important to determine what the fetus has been exposed to.”

In a similar vein, another provider asserted that obstetricians screen for drug use and substance abuse in order to detect comorbidities that patients may be facing, due to “associations between drug use and other maternal conditions.” Similarly, the importance of substance abuse screening was highlighted against the larger backdrop of the national opioid crisis.

P1: We have a responsibility to treat substance abuse as a disease, and we have a great opportunity during pregnancy to address these issues… Opioid and other substance abuse issues are a public health crises, and we can utilize pregnancy as an opportune time to determine its prevalence

Report on Midwifery

A single midwife participated in the digital questionnaire, answering directly and without justifications, as reported below:

MW1: Rapport with client; Risk factors; Presentation of client in prenatal setting; History of substance abuse; Symptoms of drug abuse

Although mentioned only briefly, including “rapport with client” as a perceived peer influence on substance abuse screening in the field of midwifery speaks to the broader patient-provider relationship. Without more information, however, the estimated directional effect of the theme remains unexplored. For example, it may be that screening is a potential disruptor to the delicate relationship that is formed, suggesting an inverse relationship between a providers’ protective attitude towards their relationship and their use of screening tools.

It may also be true, however, that substance abuse screening is used to accentuate comprehensive care that supports the relationship between a client and a midwife. A positive relationship with a client could lead a midwife to be able to identify
changes in physical, behavioral, or emotional cues that would precede a verbal screen.

Among obstetricians, by contrast, expectations about screening’s effect on the patient-provider relationship was reported as negative.

Although selective screening based on the patient-provider relationship and other factors identified by the midwife falls short of universal screening, it may still lead to use of validated tools. Even so, selective screening models tend to fail across systems when patients defy stereotypes about substance abuse and thus do not fit pre-conceived notions of what substance abuse may look like among the general population.

**Ranking Factors**

Only members of the first-round cohort were able to access the second-round of items, a design chosen with the intent of providing some level of continuity between factor-generation and factor-ranking exercises. This approach was also inspired by traditional Delphi panel sequencing. However, not all members of the first-round cohort chose to continue participation, resulting in significant study drop-off via attrition. A total of four participants matriculated into the second session.

Fourteen initial factors were presented to the panel. Items advanced for ranking into this stage of research included hypothetical statements about an obstetrician’s behavior that were derived from the panel’s input in round one. Items advanced represented themes such as: providers’ knowledge of validated screening tools, being unsure about available referral and treatment resources, not screening due to beliefs that patients will not answer honestly, not being reimbursed for lost time, and others, as shown in Appendix B.

Among all factors presented to the panel, being unsure about available resources was weighted as the most influential, with a sum score of 24. The statement was
presented as follows: “Obstetricians do not screen for substance abuse because they are not sure what resources are available to help the patient after substance abuse has been identified.”

Several other items were ranked by the panel as highly influential. “Obstetricians are not aware of different types of written and verbal screening tools, so they do not use them,” achieved a sum score of 23. “Obstetricians lack the training and knowledge to engage in substance abuse screening in a comprehensive way,” achieved a sum score of 22. Lastly, an item concerning time and cost as a barrier to screening achieved a total score of 21.

Three moderately influential items achieved a score of 18, including assessment of the effect of providers’ perceptions of race and ethnicity on screening; the effect of being uncomfortable talking to patients about substance abuse; and the perceived lack of power to treat substance abuse.

Two items related to reimbursement, one item relating to providers’ instrumental attitude about screening efficacy when patients do not answer honestly, and one item concerning providers’ “legal duty to report” substance abuse also achieved moderate ranking.

All remaining items were marked as low influence by the panel, including one relating to screening’s perceived negative effect on the patient-provider relationship and one item relating to the perception that obstetricians would be responsible for adverse fetal outcomes if they engaged in screening but did not treat effectively.

**Comparative Rankings**

In addition to weighting by sum score, which was chosen due to small sample size and its tendency to blur interpretations of mean and median reporting, participants
ranked barriers and facilitators to screening. Each factor was proposed as a negative or positive behavioral influence. In this exercise, participants created a clear hierarchy among the proposed factors.

Barriers presented for ranking included time, reimbursement, lack of knowledge of validated screening tools, liabilities to practice, damage to the patient-provider relationship, lack of confidence discussing substance abuse with patients, perception of insufficient community resources for referral or treatment, concerns over legal ramifications to patient, no clinical standard, and the perception that it is not their role to screen. In this exercise, a ranking of one was equivalent to highest importance.

Lack of confidence discussing substance abuse with patients was agreed upon by two out of four panel participants as the most influential barrier to the use of validated substance abuse screening tools in this sample. Time and costs as well as lack of knowledge were identified as the second and third most influential barriers.

Panel participants were then asked to engage in comparative ranking of the most important motivational factors influencing obstetricians’ use of validated substance abuse screening tools. Items presented included patient race and ethnicity motivates screening; office policy motivates screening; cues to action, such as electronic reminders, motivate screening; training; professional practice association policy; concerns for maternal and fetal health; peer screening behaviors; screening behaviors of a mentor; law; and other patient factors.

Office policy (clinical protocol) and maternal and fetal health were ranked as the top two motivational factors facilitating screening by the panel. Training was identified as the third most important motivational influence.
Whereas in a traditional Delphi panel a third and often a fourth series of questionnaires would be presented to a cohort over time in order to obtain consensus among experts in the field, a high level of attrition prevented deployment of additional ranking or consensus-building sessions with this panel. Two considerations guided this research decision, one methodological and one ethical.

From a methodological standpoint, statistical methods of ranking in the literature largely are guided by presentation of mean and median panel scores. The small panel size post-recruitment prevented meaningful interpretation of these statistical outputs, therefore these data were presented using measures of frequency, summative scores, and CQCA when appropriate. From an ethical standpoint, any research activity must be gauged against meaningful use of a participant’s time as a matter of beneficence and respect. With these principles in mind, and given the reduction of the panel to four members, no further data collection was justified after the close of this second session.

Testing the Internal Structure of Attitude with a Pilot Index

All items (Appendix C) were first assessed for normality through visual evaluation of distributions, examination of skew and kurtosis by item, and through statistical evaluation using the Shapiro-Wilk (1965) test. Most item distributions were significantly non-normal, with exception to three that trended towards normalcy but ultimately failed to show significant evidence of normality. The actionable result of this finding was use of non-parametric testing for inter-item correlation coefficients.

All items were tested based on their degree of correlation with other items. Few showed significant correlations below a 0.05 level using Spearman’s two-tailed correlation coefficients. Significant correlations for specific items were found between “asking a patient about drug use and substance abuse is a worthwhile use of an
obstetrician’s time” and “a patient with high income is less likely to be a drug abuser than other patients”; “a patient with private insurance is less likely to be a drug abuser than other patients”; “If a patient doesn’t appear to be using drugs, obstetricians should not ask directly about drug use and substance abuse beyond an intake form”; and “Knowing about community resources and the best places for substance abuse treatment and referral would help obstetricians screen effectively.”

Significant correlations were also independently found between “Obstetricians should have responsibility for monitoring the effects of drug use on fetal development” and “the way obstetricians screen for drug use and substance abuse changes with each patient, and standardized practices would not help them screen effectively.”

“Obstetricians are usually reimbursed appropriately for verbally asking patients about drug use and substance abuse” showed evidence of a significant inverse correlation to “Patients tend to answer honestly when an obstetrician asks directly about drug use and substance abuse.”

**Examination of Correlated Item Groups**

Following first round analyses, items were removed due to flaws in wording or presentation. Two questions using the phrase “should dictate how and when obstetricians screen” were removed as the term dictate clouded meaning, as reported by participants after taking the survey, and the terms how and when do not speak to the same outcome.

“The way obstetricians screen for drug use and substance abuse changes with each patient, and standardized practices would not help them screen effectively” was removed for being a double-question to which both parts could be answered independently, masking the meaning of a yes or a no answer. Item removal did not
change the degree of correlation between items on the first round of analyses, nor were new inter item correlations found.

In the third round of analyses, items about providers’ role were split from items discussing patient factors, and both split indices were retested tentatively with the intent of identifying items with significant positive correlations, or, in the absence of significance, very strong positive correlations (above .4).

Eight questions were tested around patient factors and obstetricians’ perceptions of patient factors as a group. Previously identified inter-item correlations held. Negatively correlated items such as “patients tend to answer honestly when an obstetrician asks directly about drug use and substance abuse” and “it doesn’t matter which method you use to ask a patient about drug use and substance abuse,” the latter of which was previously reverse coded, and “obstetricians choose who to ask about drug use and substance abuse based on patients’ race/ethnicity,” which was also a reverse coded item were tentatively removed for their negative correlations as well as their relative non-significance in any direction.

Five final correlated items were left as a group that focused on patient characteristics. The final item-set included: “asking a patient about drug use and substance abuse is a worthwhile use of an obstetrician’s time”; “a patient with high income is less likely to be a drug abuser than other patients”; a patient with private insurance is less likely to be a drug abuser than other patients”; “obstetricians can tell which patients are more likely to abuse drugs based on how they act”; and, “if a patient doesn’t appear to be using drugs, obstetricians should not ask directly about substance abuse beyond an intake form.”
Seven items were tested around obstetricians’ relative attitude concerning their role in screening and the tools and resources used to facilitate screening. No items significantly correlated, and several items showed evidence of negative correlation to one or several items.

Despite finding some evidence of item correlation between the .4 and .6 levels, indicating singular dimensionality, these tests failed to produce a coherent index and significant correlations seemed spurious. Due to small sample size, there was a high degree of homogeneity in response patterns. A single participant answering in a way that deviated from the group would reflect as negative correlations among items.

**Item Total Correlations and Cronbach’s Alpha**

Whereas inter item correlational tests were used as a first look at the structure of attitude within this sample, and several items were tentatively removed to determine if a final set of correlated items could be generated, the tests did not provide sufficient evidence to justify permanent item inclusion or item removal on a pilot index.

Therefore, all items were tested for internal consistency reliability using item total correlations and Cronbach’s Alpha, with the exception of items removed due to errors in wording during survey design, as previously discussed. Cronbach’s Alpha for all 15 remaining items as a unit was calculated at .462. Item-total scores ranged from a low of -.592 to a high of .654. Six additional items were removed based on their negative item total scores and negative affect on alpha.

A total of nine items remained as a preliminary index, with a total alpha coefficient of .87 and item total correlation scores ranging from a low of .355 to a high of .921. Remaining items included: “asking a patient about drug use and substance abuse is a worthwhile use of an obstetrician’s time”; “obstetricians should have responsibility
for monitoring the effects of drug use on fetal development”; “verbally asking about drug use and substance abuse is a type of screening best left to nurses or other clinical staff” (reverse coded); “a patient with high income is less likely to be a drug abuser than other patients” (reverse coded); “a patient with private insurance is less likely to be a drug abuser than other patients” (reverse coded); “obstetricians can tell which patients are more likely to abuse drugs based on how they act” (reverse coded); “if a patient doesn’t appear to be using drugs, obstetricians should not ask directly about drug use and substance abuse beyond an intake form” (reverse coded); “computerized electronic reminders for how and when to screen for drug use and substance abuse would help obstetricians screen effectively”; and “knowing about community resources and the best places for substance abuse treatment and referral would help obstetricians screen effectively.”

Together, these form an internally consistent but theoretically incomplete index. Caution must be taken when interpreting the pilot in terms of domain structure, or in a way that could inform the behavioral model presented during previous research stages. Results indicate that statistical measurements of attitude among this sample are challenged by small sample size, limited variance, and low power, which are limitations of study design and recruitment.

**Self-Reported Screening Behaviors**

Data about types of screening method were collected with the intent of testing relationships between attitude scores and screening methods. Ten participants marked that they engaged in universal substance abuse screening by asking every patient about drug use and substance abuse at the patient’s first visit for prenatal care. Six participants, five of which also reported engaging in universal screening and one which
did not, marked preferring use of toxicology screens when they thought patients had issues with drug use or substance abuse. A single participant did not engage in universal substance abuse screening. Universal screening in this case does not imply validated screening, nor screening in adherence to the guidelines.

Four participants providing write-in answers described how they ask patients about drug use and substance abuse.

P4: Do you use any alcohol, tobacco or other recreational drugs, for example, marijuana, cocaine, heroin? Do you have a history of tobacco, alcohol, or drug use in the past and if so, how long ago?

P7: It does not have a name. I ask "do you or have you used drugs (if they need further explanation "i.e. marijuana, cocaine")?" I ask "do you drink alcohol, how often?" "Do you smoke cigarettes?" And follow up each of these questions with quantity and frequency.

P9: I specifically ask about any substance abuse - tobacco, alcohol, other drugs and list several

P10: we want to ask about additional problems: alcohol, any medications or drugs, opioids, for the good of the baby I'm just wondering if you are taking anything... if there is anything else you want to discuss

Notably, although the way that participants reported asking within their practice generally aligned to an SBIRT approach, no participating provider in this sample described use of a validated tool such as the 4P's. Most providers supported universal screening and could be said to have generally positive attitudes, yet still provided reports of behavior that were not in sync with best practices.
Table 3-1. Factor frequency chart from an expert panel.

<table>
<thead>
<tr>
<th>Theme</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitudes and Beliefs</td>
<td>5</td>
<td>71%</td>
</tr>
<tr>
<td>Time</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>Cost</td>
<td>4</td>
<td>57%</td>
</tr>
<tr>
<td>Lack of Community Resources</td>
<td>3</td>
<td>43%</td>
</tr>
<tr>
<td>Maternal Health and Fetal Safety</td>
<td>2</td>
<td>28%</td>
</tr>
<tr>
<td>Knowledge and Training</td>
<td>2</td>
<td>28%</td>
</tr>
<tr>
<td>Provider Liabilities</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td>Patient Legal Concerns</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td>Control</td>
<td>1</td>
<td>14%</td>
</tr>
<tr>
<td>Public Health</td>
<td>1</td>
<td>14%</td>
</tr>
</tbody>
</table>
Figure 3-1. An emergent model of factors.
Figure 3-2. Reciprocal determinism among core themes.
CHAPTER 4
DISCUSSION

An Emergent Contextual Model of Behavior

The first two stages of this unified study provide preliminary evidence to support an emergent behavioral model of substance abuse screening during routine prenatal care. Whereas results from the third stage of this research do not explicitly inform the model, they may yet contribute to future instrument development initiatives.

During grounded interviews, first-person narratives from obstetricians and midwives were introduced in a way that enabled a glimpse past behavior alone. Their words provided a lens to help understand what guides them to make decisions when interacting with patients. Subsequently, we are left with a picture of how psychological reactivity paired with misunderstanding can negatively influence secondary prevention efforts in a health system.

Confirmatory exercises pursued with an expert panel added context to these behaviors. Stage two results provided information in a manner designed to triangulate the model, mitigate error from both response and social desirability biases, and add reliability to key findings. These results confirm that providers’ substance abuse screening behaviors during routine prenatal care in Florida are shaped by environmental factors as a function of the practice environment, motivational factors as a function of providers’ training and experiences, and providers’ attitudes and beliefs, which are primarily a function of culture and intrapersonal subjectivity.

Whereas the full effect of each modeled construct is variable by individual as well as professional subclass, and the sub-domains of each proposed construct are likewise dependent and to some degree subjective, the pattern of themes discussed and their
relative saturation across interviews provides enough detail to describe and act upon each domain, contributing to the broader impact potential of this research.

**Adapting Health Behavior Theory**

The emergent model of behavior presented in this dissertation, like each of its component parts, was subjected to constant comparative processes throughout analyses. Evaluation exercises were informed by these data directly, yet also by comparison with the social and behavioral sciences literature.

Many research studies are structured from the top-down, beginning with theory that is subsequently used to frame and test a hypothesis. The approach of this research, in contrast, was to start by building contextual theory. Although the default position of an interpretive approach is to reject superfluous abstraction from the theoretical literature, it is often useful to use existing literature as a comparative benchmark. Behavioral literature was built into this model, when appropriate, at the end of this process and in a flipped-paradigm approach.

A few specific constructs with contextual relevance did eventually appear suitable for integration. For example, the domain of motivation with intrinsic and extrinsic affect that appears in this research match well to Herzberg’s motivation-hygiene theory (1966). Herzberg’s interpretation of motivation-hygiene was that motivation factors (intrinsic motivators) unanimously promote work, whereas hygiene factors, or extrinsic motivators, have a dual nature: when present they motivate work performance, and when absent an inverse relationship is formed. Herzberg hypothesized that extrinsic motivators may tangentially support a behavior, but that intrinsic motivators are key to driving performance. This was observed to be generally
true, adding to the latent structure of motivation in this model of substance abuse screening.

In the current study, providers discuss patients’ physical and behavioral presentation as a motivational factor for screening. In the absence of universal screening protocol, the presence of patient cues often triggers a more comprehensive screening event. In the absence of a cue, however, an inverse relationship would be expected. Hence, patient cues are modeled here as a dynamic extrinsic factor. In contrast, providers’ sense of professional responsibility to uphold maternal and child health appears to be intrinsic in nature, provided their knowledge of validated screening tools and attitude about screening efficacy are also positively oriented. Yet even with the absence of knowledge and the presence of a negative attitudinal effect, it is not expected that providers’ duty to uphold maternal and child health will inversely relate to screening. It presents in this sample with positive affect on screening behaviors, moderated to some extent by sub-domains of alternative explanatory domains.

Another example relevant to this study is the Systems Model of Clinical Preventive Care (Walsh & McPhee, 1992), which suggests that predisposing factors, reinforcing factors, and enabling factors influence both the patient and the provider within a health system, in turn influencing performance of a preventive behavior. Variables suggested by the authors are patients’ and providers’ beliefs and attitudes, as well as health values and personal efficacy. Among suggested reinforcing factors are support of peers, previous experiences, and case-specific details, and among suggested enabling factors are training, logistics, and material support. Lastly, cues to
action, environmental factors, health care delivery systems, and preventive activities are theorized to inform the behavior at each level of interaction within the clinical model. The clinical model also draws from other well-tested theoretical supports in the behavioral literature. Among these, Green & Kreuter’s (2005) PRECEDE-PROCEED model and the Health Belief Model (Hochbaum Rosenstock, & Kegels, 1952; Rosenstock, 1974), which also informed model generation during pursuit of this unified study.

Another component from the theoretical literature applied to model development in this study were the operationalized definitions of attitude as presented in the theory of planned behavior (Azjen, 1985; Montanto & Kasprzyk, 2015). Within the theory of planned behavior, attitude is defined as a sum of positive or negative experiential and instrumental attitudes. In this research, providers’ attitudes were revealed to occur along similar lines.

For example, an element of instrumental attitude is whether a provider believes that screening a patient will elicit an honest response, negatively impacting behavioral initiation when they do not believe a patient will be honest. Such an attitude is expected to decrease the perception of screening as a value-adding tool, as a dishonest reply would not enable intervention or change pregnancy outcomes. In contrast, experiential attitudes about screening were revealed when providers discussed overall negative evaluations of the behavior due to its perceived time and cost burdens, affecting their value judgement of screening against competing procedures during prenatal care delivery, especially in global billing scenarios.
One final literature-derived product that is consistent with the results of this study is reciprocal determinism, described by Bandura (1978) as a “production of effects by events” in which persons, behaviors, and the environments that they occur are actively inter-related. Within Social Cognitive Theory, reciprocal determinism is used as a foundational rejection of unidirectional and bidirectional behavioral predictions, illustrating instead that as a matter of principle few behaviors are observed to occur linearly. Rather, they are products of place, person, and action. In this study, there are proposed reciprocities between each major domain along similar lines.

Modeled environmental influences on behavior are shown to influence and to be influenced by providers’ attitudes and motivational factors. Likewise, attitudes are shown to influence and to be influenced by practice environments and motivational factors. Screening itself and screening outcomes also add information to each domain, forming a flow of experiences, ideas, and actions within a health system. No linear relationship is suitable to explain these interactions, and the reciprocity between domains allows for variable pathways through the model to a behavioral outcome of universal validated substance abuse screening implementation.

**Modeling Pathways to Universal Validated Screening Implementation**

A final product of this study is a pathway of screening outcomes, shown in Figure 4-1. There, a provider’s attitudes and beliefs indirectly enhance or detract from use of validated substance abuse screening tools at critical junctions, when other domains appear to act as mediators and direct pathways to behavioral initiation. This product visualizes the subtle but broad influence attitudes and beliefs may have at each outcome point, moderating the degree of influence of other factors, but not contributing in a way that is necessarily causal in nature.
Both midwives and obstetricians indicated that providers make decisions to screen largely based on presentation of patients and clients in a care setting, which is heavily moderated by each providers’ beliefs about what substance abuse looks like and whether their patient fits that criteria. This effect is further moderated by a provider's attitudes concerning competing priorities as well as their approach to delivery of care in an environment with finite time and resources.

When time is short or patients are not with a single provider for the entirety of prenatal care; when issues with reimbursement de-value validated screening tools or an office is not prepared to request reimbursement for their use; and when providers believe that the broader health community is not prepared to act in a way that will benefit their patient post-referral, then screening may be perceived as a redundant, unnecessary component of care that does not improve birth outcomes. The alternate is true as well, and each step on the pathway is presented as a variable.

In summary, when obstetricians and midwives have not implemented universal screening with all patients, a specific series of conditions must be satisfied for the provider to use a validated tool with any given patient.

The full pathway from universal implementation to selective implementation is varied, long, and full of opportunities for non-adherence. In fact, all participating providers reverted to intake forms, toxicology tests, and improvised verbal screens when practicing with the absence of clinical protocol aligned to ACOG guidelines.

Based on the rising prevalence of substance abuse, drug use, and fetal exposures to illicit drugs and otherwise legitimately obtained psychotherapeutic pharmaceuticals during pregnancy; increasing rates of NAS, transient fetal morbidities,
and congenital anomalies; and supported by the findings of this study, I conclude that opportunities for prevention and early intervention have been missed and will continue to be missed until standardized, universal, validated screening protocols are implemented by obstetricians and midwives.

**Limitations**

Limitations of this unified study are a consequence of sampling design, recruitment, and methodology. Error because of systematic bias is expected during non-probability designs that cannot quantify, predict, or otherwise illuminate variance in participant characteristics and responses. However, these errors were known and accepted prior to data collection.

During study planning, it became apparent that the target population of clinical obstetric providers and midwives may be difficult to recruit due to their professional responsibilities and time commitments. It was also known that recruitment would be negatively impacted due to the content of these inquiries around adherence or non-adherence, which were communicated openly and transparently.

Referral-based and purposive sampling techniques were justified in this context, and an analytical methodology was crafted that would not depend on statistical prediction. One exception was made in this case during item-testing of a pilot index, and the general failure of those tests are cases-in-point to the challenge of recruitment and the biases of design as it pertains to measurement within classical test theory.

In terms of methodology, a grounded approach to theory generation is seldom used to prepare for quantification. The attempted translation of qualitatively generated themes for mixed methods analyses presented as a limitation, further confounded by my own drive to reify an otherwise abstracted domain. Emergent theoretical models are
not by their nature explanatory or predictive, or even necessarily reliable, when applied to broader samples from a target population. Those who participated in this research communicated personal and professional views that are not any less true if they are not representative or statistically validated in this or other samples.

Distinct from sampling design, one unexpected challenge to cross-professional comparisons between obstetricians and midwives was reticence of participation among midwives. Most of these data obtained in the field were from obstetricians and gynecologists whom contributed to a broader view of screening within the context of their personal experiences and practices. In the case of midwives, however, there is a sense that more remains to be explored. Understanding their unique roles in substance abuse screening with clients could be explored further and with more density than present here if broader access to a group of midwives was secured.

Although midwives expressed support for this study during recruitment and agreed to participate initially, many prospective participants chose not to sign the informed consent document when presented in digital format.

**Broader Impacts and Future Directions**

Exploration of phenomena influencing providers’ substance abuse screening choices is driven by the need to improve screening performance in U.S. health systems. Disparities in care are documented in the literature and further supported herein. When universal screening is not applied in a way that is valid and reliable, critical opportunities for treatment are lost.

To inform intervention and to support clinical policy making and clinical decision making, it is desirable to extract from this research points of action that will have meaning for quality improvement. The key, then, to interpreting qualitative data in a way
that is compelling to clinicians and clinical administrators is to sufficiently abstract each theme and then establish the parameters by which each sphere of influence may be acted upon within a given practice. It is expected that the weighting of influence for each domain will be variable, and thus interventions relevant to a group must be adaptive. These models provide a basis for understanding behavior which may be leveraged to frame and target interventions, but they do not provide a single answer to shape the field of obstetrics and midwifery for the better.

Rephrased, my intention was to make these models broad enough to be applied in different settings while retaining the properties that make them work. Acknowledging this, key action points for behavior change may be suggested. These include: training to increase providers’ knowledge of validated tools, activities that shift the narrative about what drug use looks like among modern patient populations, asset mapping of community resources to enhance providers’ ability to refer, incorporation of validated screening tools into global billing structures, inter-office standardization of clinical protocol, and behavioral auditing. Beyond these, change may come as more evidence is produced demonstrating the value of validated tools as inexpensive yet sensitive alternatives to toxicology testing.

These findings will be disseminated to partners in the field at ACOG within hospital networks and inter-group practice settings. This study will further inform stakeholders working to improve performance quality within health systems by shaping evidence-based approaches to maternal and child health.
Figure 4-1. Modeled pathways to screening.
APPENDIX A
INTERVIEW QUESTIONNAIRE

1. Tell me about how substance abuse screening is used or not used in your practice?
   a.  *Probe: Could you describe a typical clinical setting or patient encounter when a screening tool would be used?*
   b.  *Probe: Could you described instances when substance abuse screening would not be used?*

2. How did you come to screen using (participant-identified method)?

3. How might the way you engage patients in substance abuse screening differ from obstetricians in similar clinical practice environments?

4. What motivates you to screen?
   a.  *Alternate: Even though you do not routinely screen, could you describe a situation where you might screen a specific patient/client?*

5. Looking back over the last several years, could you discuss if your screening practices have changed?
   a.  *Probe: Has the way you implement screening changed as a result of your experiences in training or the protocol of a professional organization?*

6. Does your clinic have a protocol for screening?

7. In your opinion, what is the best practice for screening for opioid use in pregnancy?

8. What has been most helpful in performing the screening?
   a.  *Probe: Have there been any problems screening patients this way?*

9. Is there anything else that you think we should talk about to help me understand substance abuse screening in your practice?
APPENDIX B
CONFIRMATORY QUESTIONNAIRE ITEMS

1. Obstetricians do not see substance abuse screening as an important part of their role during prenatal care

2. Obstetricians lack the training and knowledge to engage in substance abuse screening in a comprehensive way

3. Obstetricians do not screen for substance abuse because they are not sure what resources are available to help the patient after substance abuse has been identified

4. Obstetricians do not screen due to perceived lack of power in medical management of substance abuse (inability to prescribe methadone and buprenorphine)

5. Obstetricians do not engage in substance abuse screening because they will not be reimbursed for the time it takes to screen thoroughly

6. Obstetricians do not engage in substance abuse screening because they will not be reimbursed for the time it takes to treat substance-related disorders during pregnancy

7. Pressure to see more patients prevents obstetricians from exploring substance abuse thoroughly with any one patient

8. Obstetricians avoid substance abuse screening because the patient-physician relationship would be damaged

9. Obstetricians do not perform comprehensive substance abuse screenings because they do not want to be liable for negative patient outcomes unrelated to pregnancy

10. Obstetricians avoid substance abuse screening because they might have a legal duty to report it

11. Obstetricians do not believe patients will answer truthfully and so they do not use verbal or written substance abuse screening tools

12. Obstetricians selectively screen clients for substance abuse based on race and ethnicity

13. Obstetricians are not aware of different types of written and verbal screening tools, so they do not use them

14. Obstetricians feel uncomfortable talking to patients about substance abuse
APPENDIX C
PILOT SURVEY OF ATTITUDES

The following questions are rated from 1 to 5, strongly agree to strongly disagree:

1. Asking a patient about drug use and substance abuse is a worthwhile use of an obstetrician’s time

2. Obstetricians should have responsibility for monitoring the effects of drug use on fetal development

3. Patients tend to answer honestly when an obstetrician asks directly about drug use and substance abuse

4. Obstetricians are usually reimbursed appropriately for verbally asking patients about drug use and substance abuse

5. When drug use and substance abuse information are already present on an intake form or electronic medical record, it is unnecessarily redundant for an obstetrician to verbally ask a patient about it

6. It doesn’t matter which method you use to ask a patient about drug use and substance abuse

7. Verbally asking about drug use and substance abuse is a type of screening best left to nurses or other clinical staff

8. A toxicology screen using a sample of urine or blood is preferable to asking a patient about drug use and substance abuse

The following questions are rated from 1 to 5, clearly describes my feelings to does not describe my feelings:

9. A patient with high income is less likely to be a drug abuser than other patients

10. A patient with private insurance is less likely to be a drug abuser than other patients (uninsured, Medicaid, etc.)

11. Obstetricians can tell which patients are more likely to abuse drugs based on how they act

12. If a patient doesn’t appear to be using drugs, obstetricians should not ask directly about drug use and substance abuse beyond an intake form
13. Obstetricians choose who to ask about drug use and substance abuse based on patients’ race/ethnicity

   The following questions are rated from 1 to 5, strongly agree to strongly disagree:

14. Association guidelines should dictate how and when obstetricians screen for drug use and substance abuse

15. State law should dictate how and when obstetricians screen for drug use and substance abuse

16. Computerized electronic reminders for how and when to screen for drug use and substance abuse would help obstetricians screen effectively

17. Knowing about community resources and the best places for substance abuse treatment and referral would help obstetricians screen effectively

18. The way obstetricians screen for drug use and substance abuse changes with each patient, and standardized practices would not help them screen effectively

   The following questions are rated as follows:

19. Which of the following best describes how you ask patients about drug use and substance abuse?
   
   a. My patients fill out a form as part of an intake packet
   b. My staff asks patients when taking their social history
   c. I ask every patient about drug use and substance abuse at the first prenatal care visit
   d. When I think a patient is using drugs or has issues with substance abuse, I use toxicology screening
   e. I only ask beyond intake if there appears to be a problem with drug use or substance abuse
   f. I ask every patient about drug use and substance abuse throughout their pregnancy

20. If you ask a patient about drug use and substance abuse, does the method you use have a name? If so, enter it below. If not, please briefly type out how you phrase the question(s).


doi:10.1016/j.neuropharm.2017.08.016


doi:10.1177/004912418101000205


BIOGRAPHICAL SKETCH

Jarrett Nathaniel Brunny was born in Pennsylvania in 1983. He received his associate’s degree from Santa Fe College in Gainesville, Florida. Subsequently, he transferred to the University of Florida to continue study of human culture, biology, and value systems. His study of anthropology culminated in the award of a Bachelor of Arts in 2007, where he simultaneously achieved a minor in the field of geography.

During the following years, Jarrett’s studies turned to demographics, environmental aspects of health, and social constructs that shape our collective perceptions of identity and wellness. This led to successful pursuit of a Master of Public Health at the University of South Florida, awarded in 2012. While interning at the Florida Department of Health in the Tampa Bay Area, he came to understand the generational effects of poverty which manifested in the suffering of children living just blocks from the city’s center.

His reflexive position of advocacy for maternal and child health would eventually culminate in study of healthcare providers’ role in screening for maternal and fetal substance exposures in the wake of a national opioid misuse epidemic. He was awarded a Doctor of Philosophy from the University of Florida College of Public Health and Health Professions in fall of 2017.

Jarrett’s career has been focused on developing community capacity to address issues of equity for children, a role he continues to build upon in academia, business, and nonprofit settings.