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Constructing the Uncertainty of Due Dates

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Abstract

By its nature, the date that a baby is predicted to be born, or the due date, is uncertain. How women construct the uncertainty of their due dates may have implications for when and how women give birth. In the United States as many as 15% of births occur before 39 weeks because of elective inductions or cesarean sections, putting these babies at risk for increased medical problems after birth and later in life. This qualitative study employs a grounded theory approach to understand the decisions women make of how and when to give birth. Thirty-three women who were pregnant or had given birth within the past two years participated in key informant or small group interviews. The results suggest that women interpret the uncertainty of their due dates as a reason to wait on birth and as a reason to start the process early; however, information about a baby's brain development in the final weeks of pregnancy may persuade women to remain pregnant longer. The uncertainties of due dates are analyzed using Babrow's problematic integration, which distinguishes between epistemological and ontological uncertainty. The results point to a third type uncertainty, axiological uncertainty. Axiological uncertainty is rooted in the values and ethics of outcomes.

Keywords

pregnancy; due dates; uncertainty; problematic integration theory; narrative theory

For many women, pregnancy is a time characterized by many uncertainties (Matthias, 2010). One aspect of these uncertainties is the date that a pregnant woman is predicted to go into labor, or the due date. This date is a calculation based on the first day of a woman's last menstrual period (Salomon, Pizzi, Gasparrini, Bernard, & Ville, 2010). These calculations, if confirmed by ultrasound, are accurate within 5 days of delivery 95% of the time. In practice, this means that these estimates are an accurate predictor of gestational age within one to two weeks (Engle & Kominiarek, 2008), meaning that the exact day a baby will born is uncertain unless a medical provider schedules an induction or a cesarean section (c-section) before a woman goes into labor.

Scholars note that the inability of medical science to predict exact due dates may be a cause of early term and preterm birth (Engle & Kominiarek, 2008). However, little attention has been paid to the way women construct the uncertainty of their due dates and how this construction influences their decision to induce or perform a c-section before 39 weeks of gestation. Understanding how women understand this medical knowledge and negotiate their uncertain due dates may be critical to understanding elective early-term births.

A full-term pregnancy lasts 39 to 40 weeks of gestation (Ashton, 2010); however, the optimal time to give birth in terms of outcomes for the baby is 40 weeks (Chescheir & Menard, 2011). Unfortunately, the trend for maintaining a pregnancy for 40 weeks in the United States has been declining since the 1990s (Engle & Kominiarek, 2008). This decline in pregnancy length is thought to be the result of elective inductions and c-sections, in other words, inductions and c-sections that have been performed for nonmedical reasons (Ashton, 2010). The exact number of elective procedures performed within the United States is unknown due to inadequate documentation in medical records. Researchers estimate that 10-15% of all births in the United States are the result of elective deliveries before 39 weeks of gestation (Clark et al., 2010).

The decision of when to give birth is important because babies born early are at a higher risk for neonatal morbidity (Chescheir & Menard, 2011). These babies have a higher risk for breathing problems, are more likely to spend time in the neonatal intensive care unit (NICU), and are more likely to be readmitted to the hospital (Buus-Frank, 2005). Additionally, a substantial amount of brain development occurs in the final weeks of pregnancy (Darnall, Ariagno, & Kinney, 2006). Early term and late preterm infants are more likely to develop attention deficit hyperactivity disorder (ADHD) as they grow older and are more likely to suffer from behavioral problems than their full-term counterparts (Engle & Kominiarek, 2008). Further, these early births are expensive in emotional and medical terms (Clark et al., 2010). If the number of these elective early term births were reduced nationally to less than 2% of all births, the medical savings from the resulting decrease in the neonatal intensive care unit (NICU) admissions alone would approach an estimated \$1 billion annually.

Survey research suggests that pregnant women may not understand the importance of maintaining a pregnancy through 39 weeks: In a 2009 survey of 650 women who had been pregnant within the previous 18 months, only 7.6% chose 39 to 40 weeks as the safe time to deliver (Goldenberg, McClure, Bhattacharya, Groat, & Stahl, 2009). However, the study did not explore why women think that early births are safe and what can influence that belief.

This study uses qualitative data from individual and group interviews with 33 pregnant and recently pregnant women to explore how women negotiate the uncertainty of their due dates and their desires to give birth. Although women doubtlessly turn to many others during this process, including their partners and other mothers, we focus in this study on the perspective of the women who are pregnant.

Narrative as a Framework for Understanding Birth Decisions

In many ways, narrative is an obvious framework through which to understand birth decisions. Women have traditionally learned about birth and shared their experiences through birth stories (Munro, Kornelsen, & Hutton, 2009). Pregnant women value these personal stories for the emotional understanding they offer (Lowe, Powell, Griffiths, Thorogood, & Locock, 2009). Women who are pregnant for the first time often see birth stories as a way to cope with their pregnancies, and these stories help to incorporate women into the culture of being pregnant (Savage, 2001). Birth stories have been employed to examine the master narratives of pregnancy as an illness to be cured or as a complication to be scheduled around work (Buzzanell & Ellingson, 2005). Munro et al. (2009) used birth narratives to examine the social and cultural influences surrounding elective c-sections. Vandevusse (1999) used birth stories to examine the involvement women felt in the decision-making process and thus their satisfaction with the birth experience. Bylund (2005) used content analysis to further Vandevusse's work (1999) by exploring decision-making and patient satisfaction in 551 birth stories posted to a web site. Bylund's (2005) analysis found that women most often felt involved in the decision of whether to use pain medication but did not feel as involved in other decisions in the birth experience. Although the study found that 201 decisions involved c-sections and inductions, Bylund's analysis did not examine whether these decisions involved elective procedures, whether they occurred before 39 weeks, or whether these procedures were initiated by mothers or providers.

Narrative Sense-Making and Uncertainty

Beyond its capacity to convey birth stories, narrative represents an important way in which people engage with one another and the world (Kreuter et al., 2007). Narratives "situate us in socially constructed time, space, and relationships" (Babrow, Kline, & Rawlins, 2005, p. 50). They help us make sense of the world, particularly in the chaotic and often uncertain realm of health (Sharf, Harter, Yamasaki, & Haidet, 2011). Stories not only provide a way for women individually to make sense of the experience of giving birth, but they also embody and reveal cultural beliefs, norms, and values women bring to the experience (Larkey & Hecht, 2010). Narrative can be effective, in particular, in understanding the messages women receive around a particular issue and how they make sense of these messages and incorporate them into their decisions (Hopfer & Clippard, 2011). This line of narrative inquiry falls within the experience-centered tradition of Paul Ricoeur (Squire, 2008), which views narrative as a means of sense-making. Instead of focusing on narrative structures, this tradition is interested in narrative as experience.

The sense-making aspect of narratives can be analyzed using Babrow's problematic integration theory (Babrow et al., 2005). PI was developed originally to understand uncertainty in illness and thus respond to it (Babrow, Kasch, & Ford, 1998). "Effective response to illness depends on the ways that patients, loved ones, and health practitioners understand and co-construct the many uncertainties that comprise the illness experience" (Babrow et al., 1998, p. 3). Although the status of pregnancy as an illness is contested, one can easily substitute the word "pregnancy" for illness in the quote above to articulate the experience of uncertainty for pregnant women. Brashers (2001) argues that even the healthy

are no longer immune to the uncertainty of illness, as the current state of medical knowledge gives the healthy much about which to worry and be uncertain. This is especially true for the healthy state of pregnancy, which encompasses many uncertainties, including the knowledge of when it began and when it will end.

PI is one of three prominent communication theories concerned with how individuals experience uncertainty. Uncertainty reduction theory (URT), which was originally used to explain interpersonal interactions between new acquaintances, predicts that people will want to reduce uncertainty and do so through information-seeking behaviors (Bradac, 2001). Uncertainty management theory (UMT) offers a more nuanced view of uncertainty and draws attention to the way in which people sometimes seek the state of uncertainty (Brashers, 2001), especially when increasing certainty — the diagnosis of a fatal disease — is more threatening than the state of uncertainty. Like UMT, PI offers a more nuanced view of uncertainty than URT. Both theories challenge that ideas that uncertainty can only be addressed through information-seeking and that uncertainty is bad. PI calls attention to the ways in which people's expectations and desires are entwined and influence their understandings of uncertainty and the decisions they make as a result of that uncertainty (Babrow, 2001). As will be discussed in more detail in the methods and discussion sections, we turn to PI in this study as the concepts of probabilistic and evaluative orientations — people's expectations and desires — helped us understand the decision-making process women engaged in as they made sense of the uncertainty of their due dates.

Probabilistic orientations are concerned with individuals' understandings of experience, the hows and whats of experience (Babrow et al., 2005). Babrow (2001) distinguishes between two main types of uncertainty that destabilize probabilistic orientations, ontological uncertainties and epistemological uncertainties. Ontological uncertainties arise from the indeterminacy and undeterminacy of causes, while epistemological uncertainties arise from the nature of how we know. Epistemological uncertainties may develop from concerns about the quality of information, the source of information, and the way in which we associate objects of thought — our probabilistic orientations — with one another. Evaluative orientations are concerned with the goodness or badness of a particular outcome; these are essentially the emotional and moral understandings of experience. In order to create meaning, PI says that individuals need to integrate their probabilistic and evaluative orientations, their expectations and desires. PI posits that this integration is inherently problematic, as people's orientations often destabilize one another.

Much of this integration occurs through narrative activities (Babrow et al., 2005), as individuals integrate their probabilistic and evaluative orientations to produce a coherent understanding of their realities. Through stories, individuals make sense of what doesn't make sense and create certainty out of uncertainty. Integration is necessarily messy and lacks mathematic rationality, but it allows people to make sense of the uncertainty of existence and, at the same time, accept that uncertainty. Based on the discussion above, this study explores the following research questions:

Research Questions

RQ1: How do women interpret the uncertainty of their due dates?

RQ2: What probabilistic and evaluative orientations do women bring to the experience of giving birth and their views of when it should happen?

Methods

The study considered three groups of women: currently pregnant women, women who had given birth within the past two years by means of a spontaneous birth or a medically necessary c-section or induction, and women who had given birth within the past two years by means of an elective induction or c-section. Both pregnant and recently pregnant women were included in order to collect stories from women during the experience of being pregnant and after, as one way to ensure the trustworthiness of the findings (Butler-Kisber, 2010). Other strategies included the use of multiple coders in the analysis process, recruitment in three geographic regions, recruitment of pregnant and recently pregnant participants, participants with elective and non-elective birth experiences, and, during coding, negative case analysis (Lindlof & Taylor, 2011) .

The study employed both individual and group interviews to collect the women's stories. Group interviews take advantage of the way in which people tend to comment on the experiences of others (Lindlof & Taylor, 2011). It is the dynamic of the group interaction that makes the group interview a powerful tool for understanding how people approach reality and their experience of it. However, group interviews are not appropriate for all participants, because the advantage of the group is a disadvantage when the interviews include participants who may not speak if they feel that their experiences are different from others' experiences or expectations. For this reason, the women who had experienced elective c-sections or inductions before 39 weeks were interviewed individually.

After Institutional Review Board (IRB) approval was obtained, participants were recruited to take part in group and individual interviews. Women 18 years and older were recruited in three geographic locations using materials designed by the University of Kentucky Center for Clinical and Translational Science. The center provides assistance in recruiting participants for research studies. Center staff designed recruitment materials according to IRB specifications, posted information about the study on the Center's study recruitment website, and posted information about the study at various locations in a large, academic medical center. Information about the study was also posted in online mothers' groups and on Craig's list. Flyers were handed out at day care centers, community centers, public health clinics and programs, medical practices, and businesses aimed at new mothers. All study information directed women to contact researchers and advertised a \$10 gift card. Women who contacted researchers were screened and assigned to group or individual interviews. Women who indicated during the screening process that they had had a spontaneous birth before 37 weeks were not included in the study as their experience of pregnancy was not the focus of the study (i.e., they had not decided to give birth early) and to avoid causing unnecessary feelings guilt for these women.

Group and individual interviews with 33 women began on July 5, 2011, and continued until January 26, 2012. The group interviews ($N=7$, 29 participants) were conducted at three different private locations and consisted of 3 to 5 participants. The group interviews were conducted in three geographically diverse regions within the state of Kentucky. All of the women who participated in individual interviews ($N=4$) indicated during the screening process that they had had an elective c-section or induction. Before beginning the interviews, the participants filled out questionnaires, in which they reported demographic and pregnancy information.

The group and individual interviews followed a similar format. The protocols were vetted by a medical doctor (MD) and other researchers and were modified according to their suggestions. The protocols began with open-ended questions guided by narrative theory (Munro et al., 2009). These questions asked the participants to tell stories about their birth decisions and influential moments in the decision-making process. Questions included, "Can you tell me a story about how you decided to give birth, whether to wait for your due date or to schedule it?" and "Can you tell me a story about a key moment in making that decision, maybe talking to someone influential?" From there, the protocols explored women's thoughts about the length of a pregnancy and their knowledge of the causes and consequences of preterm birth. These questions were based on previous research on birth and decision-making (Darnall et al., 2006, Goldenberg et al., 2009). Questions included, "Are there any risks for a baby when it is born before 40 weeks?" and "Do you know what makes a woman more likely to have a preterm birth?" The final questions dealt with women's knowledge of brain development in the final weeks of pregnancy. These questions were based on the medical literature (Engle & Kominiarek, 2008). Questions included, "What do you know about your baby's brain development?" and "What happens in the final weeks of pregnancy?"

During the final set of questions, the participants were also shown the Healthy Babies are Worth the Wait Brain Card (see Figure 1). The women were directed to read the card and then asked for their reactions. The card, which was developed for the March of Dimes and the Healthy Babies are Worth the Wait campaign, illustrates the differences between a baby's brain at 35 weeks of gestation and 40 weeks of gestation. If it became apparent during this discussion that the card was causing unnecessary feelings of guilt, study procedures called for the interviews to be ended and the participants to be directed to resources that might help them deal with these feelings, including the March of Dimes. This provision was never used during the study.

Participant Demographics

Across group and individual interviews, most of the 33 participants were White and, on average, 28 years old. Participants ranged in age from 19 to 40 years old. One Black woman and one Hispanic woman participated in the study. Most of the women reported having attained more than a high school degree, with 36.4% ($N=12$) reporting some college, 24.2% ($N=8$) reporting a college degree, and 30.3% ($N=10$) reporting a graduate degree. The remaining women (9.1%, $N=3$) reported a high school degree or a GED certificate. The women reported family incomes of less than \$20,000 to more than \$80,000. Almost half of

the participants reported an annual income between \$20,000 and \$60,000 (45.5%, $N=15$). One-third 33% ($N=11$) reported income of more than \$60,000. Approximately 15% ($N=5$) of participants reported income of less than \$20,000. Two of the women declined to indicate their income. Almost one-third (30.3%, $N=10$) of the participants indicated that they received health insurance through Medicaid, the state and federally funded insurance program for low-income earners.

Analytic Procedures

The recordings were transcribed verbatim and then edited to remove all identifying information. In order to ensure the accuracy of the transcripts, the first author read the transcripts and listened to the recordings multiple times. The coding took a grounded theory approach, in which the researchers allowed themes and concepts to emerge from the data using a constant comparison method (Strauss & Corbin, 1990). Key points of text were extracted from the data and then reassembled as codes in a separate document. The first and second authors coded the data separately and then met with the third author to discuss emerging codes and to resolve any disagreements that arose in their interpretations. Through discussion, codes were refined and created.¹

In the second cycle of coding (Saldaña, 2009), the researchers looked for the relationships among and between codes using axial coding. Through this process, it became apparent that the relationships among codes mirrored PI (Babrow, 2001), and that PI offered a way to explain how the women made their decisions of when and how to give birth. Another strategy used at this stage was negative-case analysis, as researchers looked for incidents that disconfirmed the analysis and used those incidents to revise and revisit categories. This iterative process continued until theoretical saturation was reached (Strauss & Corbin, 1990). At that point, the analysis could account for the participants' narratives of their birth decisions, and, at the same time, no new information seemed to be emerging from the data.

The Uncertainty of Due Dates

The women in this study understood that a full-term pregnancy lasted 40 weeks, but they viewed their individual due dates as uncertain, meaning that they could not be predicted. Tiffany² (pregnant)³ called the uncertainty surrounding the due date "give time." "Because they can halfway pinpoint where you got pregnant," she explained. "But most of the time there is no exact knowledge of, unless you've been really working it out – but there's no exact time that you did get pregnant." Mary (39 weeks) explained it this way, "They can't pinpoint exactly what day you conceived." Andrea (40 weeks) commented, "They could always be off on your due date."

Both the epistemological and the ontological uncertainty of due dates is apparent in the women's discussion of their due dates. The women understood that the estimate itself could be off, meaning that the quality of the information they were given could be wrong and that the due date itself was unknowable. The women interpreted the uncertainty of their due

¹A complete list of the codes developed through analysis is available from the first author upon request.

²All names have been changed to protect the identity of the participants.

³For all study participants, their pregnancy/birth outcome is noted in parentheses or in the text following their names.

dates as both a reason to wait on the baby and as a justification for inducing before 40 weeks. The women who interpreted the uncertainty as a justification for inducing early did not view the final weeks of pregnancy as important to their babies' development as the women who interpreted the uncertainty as a reason to wait.

Probabilistic Orientations toward Due Dates

The women interpreted this "give time" to mean that their pregnancy could be shorter or longer than 39 to 40 weeks. For many participants, the uncertainty of the due date did not mean that they would necessarily wait for birth. Their probabilistic expectations characterized these births before 39 weeks as unproblematic and okay. Several of the women said 37 weeks would be a "safe" time to give birth. Samantha (39 weeks) explained that 38 was a "good number." "Like 40 is the number that everyone says, but I think two weeks early is okay," she said. "They say that usually by then they're pretty developed and everything." Beth, who was pregnant with her third baby, had previously had two inductions for non-medical reasons, one at 39 weeks and one at 38 weeks. She also thought 38 was a good number because her boys "didn't have any problems."

Other women interpreted the uncertainty of due dates as a reason to stay pregnant as long as possible, as a reason to let the baby and their bodies decide when to give birth. Their probabilistic expectations characterized these births as risky and not safe. Jamie (39 weeks) thought it was important not to induce, even at 40 weeks. "You know, they say it's something that the baby secretes that starts the labor process, when their lungs are mature, and so, just let the baby decide," she said. Monica (41 weeks) explained, "When your body starts labor, then you know you're full term."

The women's probabilistic expectations about the length of a pregnancy were shaped by their own experiences and by information they gleaned from media sources, from other women, and from their providers. Although a couple of the participants mentioned their partners as they discussed their decision-making process, most of the participants did not.

Information as foundation—The women in this study often relied on commercial websites and books for information about birth and pregnancy, and the information they acquired served as foundation for the decisions they later made. The women indicated that these sources often implied that births as early as 37 weeks could be considered full-term. In order to find information, many participants "googled" a particular subject. "I would look up, you know, certain things that were going on with me," explained Maggie (36 weeks, scheduled induction), "like if I had really bad heartburn or whatever, aches and pains or weird feelings." Barbara (40 weeks) said, "I started looking up on the Internet, how many different ways you can have a baby at home, have a baby without pain medicine, and everything."

Especially at the beginning of a first pregnancy, the women reported a high need for information and, as a result, intense information-seeking behaviors. "I don't know what's going on," explained Marcia, who was six weeks pregnant with her first child at the time of the focus group. "I really don't. This is the most confused I've ever been in my life." Tammy, another first-time pregnant woman, reported that she watched a lot of YouTube

videos that showed the week-to-week growth of a fetus and that she had ordered “a lot of books.”

Other women's stories—The women also spoke of the influence of other women's stories of giving birth. Judy (40 weeks) explained that her approach toward birth started with her grandmother and her mother. “My grandmother had her babies at home until the last two,” Judy said. “And she did everything at home, like naturally. And then my mom was in the hospital, but waited a long time to have drugs.” Kim (41 weeks) explained that her own birth and the stories she heard from her mom influenced her decision. “She didn't have any epidural,” Kim said. “I was actually born in a bathtub.”

In some cases, the knowledge from other mothers came from on-line relationships. Carrie (37 weeks) had friends with whom she kept up through social media that encouraged her, beginning with her third child, to wait for birth. “There's a few other women through a group that I was a part of, that just talked about natural child birth and just gave their stories,” she said. Allison (39 weeks) joined an online group called Café mom. “Most of those women have homebirths, and a lot of them are midwives, so I got a lot of information and good tips from them,” she said.

Providers—Providers also shaped women's views of the length of a pregnancy, although the women mentioned this source of information less often than they mentioned other women and the media. Lisa's (37 weeks, c-section) provider gave her the impression that her daughter would be okay, once an amniocentesis showed the lungs were developed at 37 weeks. Heather (37 weeks) said that her provider wouldn't induce before 41 weeks with her first because “he wants to know what your body is capable of,” she said. With her second baby, he was willing to schedule an induction at 37 weeks because, “you're safe and everything,” she said. The women reported that providers sometimes pushed them to stay pregnant longer. Mary's (39 weeks) provider reminded her when she asked for an early induction that it was, “best to stay pregnant until 39 weeks.”

Evaluative Orientations

The women's evaluative orientations toward their due dates were shaped by their probabilistic orientations. Their evaluation of the goodness or badness of staying pregnant was predicated to some degree on their knowledge of the development that occurs in the final weeks of pregnancy. Women who knew more about the development in the final weeks of pregnancy tended to regard early births as bad. However, their evaluative orientations were also shaped by their experience of pregnancy, the amount of discomfort they felt being pregnant, and the excitement they felt to meet their babies.

Women are “done.”—By the end of pregnancy, many of the women said they were “done” being pregnant. Molly (40 weeks), who began asking her provider for an induction at 36 weeks, explained, “I was absolutely miserable... Yeah, I was like, let's get it done.” Leslie (40 weeks) reported, “I so wanted the baby out of me ...It was just miserable.” Kathy, who had an elective c-section at 39 weeks, tried to have her baby earlier. She was uncomfortable from swelling and, as will be discussed later, pretended to have symptoms of preeclampsia,

a pregnancy condition that is a justifiable medical reason for inducing or performing a c-section before 39 weeks. “I was just, I was done,” she explained. “Not that that’s okay. But, you know, that last four weeks is very, very tough.”

Ready to meet their babies—The women were also ready to meet their babies and excited about the birth. Heather (37 weeks) explained that even women who have comfortable pregnancies get tired of being pregnant, of the looks and the comments about how they’ll “pop tomorrow.” “It’s a combination of the being done and the being ready for that next step,” she said. Liz (39 weeks, induction) echoed Heather’s sentiment. “You’re always ready for them to come out,” Liz said. “Because you want to see what they look like.” Diana (pregnant) described the excitement as a desire to see her baby and know that it was okay. She explained, “After I get past that 36-week mark, knowing that I’m rounding that corner to 37, I start getting more anxious.”

Wanting a healthy baby, wanting to be with babies—Even though the women told stories of wanting to be done with their pregnancies, they feared the NICU where medically compromised babies go after birth. The idea that “other people” might take care of their babies, as Carrie (37 weeks) put it, was scary. Samantha (39 weeks) didn’t want to be induced or scheduled, because she was afraid her baby wouldn’t be healthy. “It would have put more stress on me,” she said. “And I would have been worried about, what if it’s too early? What if he’s not ready?”

Feeling that their babies had come early was a source of regret and sadness. Kathy, who had an elective c-section at 39 weeks, said her baby had been “plucked a little bit early.” Her daughter needed oxygen at delivery, didn’t breastfeed well, and lost a troubling amount of weight after birth. “She would have had an easier time had I waited a couple weeks,” Kathy said. Liz (39 weeks, induction) also felt that her baby had been forced out earlier than necessary. “If she had went longer, she might have been a little bit more developed than she was,” Liz explained.

Women also wanted to remember the birth experience. Clacie (40 weeks) didn’t want to have an “awful” birth. “You want to remember it,” she said. Liz had an elective induction at 39 weeks and ended up with an emergency c-section because of a prolapsed cord. The experience made her vow never to have an induction again. “It was hard on both of us, and I don’t remember seeing her,” Liz said.

Preterm is bad—The women were familiar with the problem of preterm birth and knew they wanted to avoid preterm births. Preterm births were “scary,” as Maggie (36 weeks, induction) put it. Heather (37 weeks) explained that preterm meant worry about the “significant” health issues a baby might have. Babies born after 37 weeks but before 39 weeks, however, were seen as qualitatively different from preterm babies. Even women who did not want to schedule inductions or c-sections did not regard early births as bad. Tiffany (pregnant) explained that “most babies I’ve seen come at 38 weeks” were fine. Clacie (40 weeks) had a friend who had a baby three weeks early. “She seems really healthy and everything,” she said.

Bodily knowledge—While some of the women talked about wanting to give birth before 39 weeks, other women didn't want an induction or c-section. These women tended to speak of birth as a “natural” process, and they wanted to wait until their bodies and their babies knew it was time to give birth. These were the same women who, as mentioned earlier, saw the uncertainty of the due date as a reason to wait to give birth. Tiffany's husband, for example, was a truck driver, and a scheduled birth would have meant that her husband would be present for the birth, she explained. However, Tiffany (pregnant) didn't want a scheduled birth. “Because the doctors and even I don't know when she's ready as much as she does, as my body does,” she explained. Clacie (40 weeks) attributed her determination to stay pregnant to her determination to not “mess anything up.” “Because I was really uncomfortable,” she said. “I was constipated the whole time... I was swelling... But I'm so hardheaded that I was not even gonna think about getting induced.”

The Uncertainty of Evaluative Orientations

In some cases, particularly when their pregnancies involved medical complications, the women expressed uncertainty as to whether the timing of their birth was good or bad. Leslie (40 weeks, induction) worried that the discomfort and itching she experienced meant something was wrong. “It hurt so bad, and I was concerned because, you know, I go on the Internet and you read all this stuff, and [my provider] couldn't tell me what was wrong with my skin,” Leslie said. At the same time, Leslie knew that inducing early would have meant a pregnancy that was less than 40 weeks. Debbie (37 weeks, induction) also experienced complicated pregnancies. In her stories of birth, it is apparent that she evaluates her early births with uncertainty. The early births of her children were positive as they ended miserable pregnancies, but they were also negative, as her children were born before 40 weeks of gestation. “I had an induction at 37 weeks and 5 days with my youngest because I was ill,” Debbie explained. “And we were severely worried about his size. He was just measuring in the third percentile. But I was so sick. He had to be evicted.”

Providers as Gatekeepers

While the women's probabilistic and evaluative orientations shaped their desires to give birth, whether or not the women received an elective induction or c-section before 39 weeks depended on their provider. In both the group and individual interviews, women told stories of asking their providers for c-sections and inductions before 39 weeks. In these stories, the providers function as gatekeepers: They do as the mother requests, or they don't.

Lisa asked her provider when was the earliest she could have a c-section and, with the provider's approval, scheduled it for 37 weeks and a couple days because of her husband's work schedule. “We mainly did the c-section just for our convenience,” she explained. “That was the only week he could get off.” Kathy (39 weeks, c-section) pretended to have symptoms of preeclampsia in order to deliver her daughter early, symptoms that couldn't be measured by a test. Molly (40 weeks) was also uncomfortable and also tried to convince her provider to let her have an early birth. “And every week, I'd be like, ‘Are you going to give me an induction today?’ She's like, ‘No.’ I'm like, ‘Yes you are.’...She's like, ‘No, let's wait ‘til next week.’” Leslie (40 weeks) also wanted her pregnancy to be over. She was miserable. She itched. It was hard to walk. But her doctor was not ready to induce. “She's

like, ‘Well, I don’t want to do anything. Just try to bear with it. It will be over before you know it.’ I’m just like, uhhhhh.”

In two cases, the women felt their providers initiated early births for the providers’ convenience. Liz (39 weeks, induction) said that her provider came into an appointment and asked, “ ‘Okay, you want to have a baby Tuesday?’ ” She didn’t question the reason for scheduling the birth until afterward: Her child was due on Memorial Day, and the provider scheduled it a week earlier. “I’m not stupid,” she said. “He didn’t want to worry about it.”

With her first child, Maggie’s provider broke her water at 36 weeks. Maggie didn’t question the decision, and her provider didn’t give her a reason. “It was like total trust in the doctor,” she said. Maggie found out later that her provider had plans to leave town the day following her daughter’s scheduled birth.

Brain Development as Influential Factor

Across interviews, brain development was seen as an important factor to consider when deciding when to give birth. At the end of the focus groups and interviews, the women were shown a copy of the Healthy Babies are Worth the Wait Brain Card (see Figure 1) Some of the women were aware of the brain growth that occurs in the final weeks of pregnancy and had seen the card before. Many of these women talked about the information on the card before it was discussed. These women presented the information about brain growth in the final weeks of pregnancy as an important reason to stay pregnant until their due dates. For example, when women were asked about the differences between a baby born at 37 weeks versus one born at 40 weeks, Holly (pregnant) said it was “massive.” “They show pictures of the brain of a 36-week-old and a 40-week-old,” she said, “and it’s a massive difference.” Samantha (39 weeks) said that the pictures “stuck” with her. “This is one of the reasons why I wanted to wait for him to reach 40 weeks,” she said.

For the women who had not seen the card before, the information was seen as important and persuasive. In addition, it changed their evaluative orientations toward birth before 40 weeks. Leslie (40 weeks, induction), who had seemed angry with her doctor for not providing an induction when she wanted one, became glad that she had waited. “Like knowing this now and 40 weeks – they don’t forget to breathe,” she said. “And like I’m so scared now from the whole SIDS situation, and if I would have him taken out early, you know, he may have had a greater chance of that. Maggie (36 weeks, induction) said that the information would have encouraged her to question her doctor and ask for reasons. “I probably would have been like, hey, what’s up with this?” Diana (pregnant) reported that seeing the difference in the size of the brain at 35 week and 40 weeks quelled some of her anxiousness and excitement to see her baby and helped her to “chill out.” “So, like, this actually helps take away some of that anxiety of, over I want to see my baby, I want to hold my baby, I want to see what he looks like,” she said.

Interpreting the Uncertainty of Due Dates

The findings suggest that how women understand and interpret the uncertainty of their due dates influences whether they seek an elective induction or c-section before 39 weeks of

gestation. The women in this study understood that preterm births were bad and should be avoided, but they did not consider babies born after 36 weeks and before 39 weeks to be much different than babies born full term. These babies seemed normal to them.

The birth decision model (Figure 2) describes two routes to a woman's decision of the timing of birth. It begins with the women's probabilistic and evaluative orientations toward birth. The women who follow the top half of the model have probabilistic expectations that early, elective births are risky for their babies' health. They evaluate waiting for birth as good and important. When these women integrate their probabilistic and evaluative orientations, they tend to interpret the uncertainty of their due dates as a reason to wait. The women who follow the bottom half of the model tend to have probabilistic orientations that emphasize how developed their babies are, starting around 37 weeks. They expect that their babies, even if born a little early, would be healthy and okay. These women's evaluative orientations tend to emphasize the difficulty and discomfort of waiting and their eagerness to see their babies. When these women integrate their probabilistic and evaluative orientations, they tend to interpret the uncertainty of their due dates as a reason to schedule their babies' birth before 39 weeks. From both of these groups of women, some women go into labor spontaneously before 39 weeks of gestation. As the model shows, a key factor in whether these women receive early elective inductions and c-sections are providers. The providers tend to be willing to schedule birth before 39 weeks or not. Depending on the provider's orientation, the women either have inductions and c-sections before 39 weeks, or they wait for a spontaneous birth or a scheduled induction or c-section after 39 weeks of gestation.

Theoretical Implications: The Uncertainty of Value

This study demonstrates how PI can be used to understand the decision process and the multiple layers, the probabilistic expectations and evaluative orientations, involved in medical decision-making, particularly when the decision involves uncertainty. As demonstrated by this study, PI allows for a rich and nuanced understanding of how a decision is made and offers insight into how that decision might be influenced.

The analysis also points to a third type of uncertainty that may further illuminate the meanings of uncertainty. On several occasions Babrow has called for a more nuanced understanding of uncertainty (Babrow, 2001; Babrow & Matthias, 2008), as a way to identify better responses to uncertainty. Babrow argues that uncertainty is often used as a catch-all term by scholars, and the lack of precision impedes scholars' understanding of uncertainty. As noted earlier, Babrow has distinguished between two main types of uncertainty that destabilize probabilistic orientations, ontological uncertainties and epistemological uncertainties. We propose here that in addition to ontological and epistemological uncertainty, evaluative orientations may also be destabilized. Although Babrow (2007) notes that probabilistic orientations can shape and destabilize evaluative orientations, he does not explore the possibility that evaluative orientations may be uncertain in and of themselves. In order to align with Babrow's typology of uncertainties, we call this type of uncertainty axiological uncertainty.

Axiological uncertainties are uncertainties that have to do with the ethics and values individuals bring to evaluative orientations. This happens when individuals don't know

whether an event would be good or bad; individuals are uncertain as to the moral and ethical implications of the event. For the women in this study, for instance, ending a pregnancy a little early would be good, because they were uncomfortable, they were ready to be done being pregnant, and they wanted to meet their babies. At the same time, ending a pregnancy too early would be bad, because they didn't want their babies to end up in the NICU, they didn't want to be separated from their babies, and they wanted their babies to have the best start possible, especially when it came to brain development. These diverging desires destabilize the women's evaluative orientations, creating uncertainty as to whether the timing of an elective birth would be good or bad.

In the realm of medical decision-making, axiological uncertainties often occur with more profound implications than were seen in this study. A treatment may save a life, but at what cost and at what quality? Patients and their loved ones navigate a world where medical science has accomplished much, and they have much for which they may be thankful. At the same time, patients and family members ask themselves whether it is good to prolong a life using ventilators and feeding tubes when there is no hope of restoring consciousness or whether a heroic 15-hour surgery that temporarily saves a life is worth the pain. These are not easy questions, and the uncertainty of what is good and right destabilizes evaluative orientations, making integration problematic and messy.

These are moments when addressing uncertainty is challenging. Brashers (2007) argues that managing uncertainty is not always straightforward. Sometimes this is because uncertainty is epistemological in nature: Medical information may be contradictory or complex. Sometimes this is because the uncertainty is ontological in nature: The answers cannot be known. We would suggest that managing axiological uncertainty is also challenging. Indeed, these moments of axiological uncertainty may be moments when patients and their families experience profound uncertainty. These moments may be so devastating that patients and families cannot act, and so they make decisions by not making decisions. They may also be moments when decisions are made on feelings of hope or despair. While this study does not provide enough evidence to fully define axiological uncertainty and unravel it from epistemological and ontological uncertainty, this study points to its existence and the need to further consider what axiological uncertainty means and how providers and others can best help those who experience axiological uncertainty.

Practical Implications

Although this study has focused on how women interpret the uncertainty of their due dates, it also has implications for the public health problem of early births. Most notably, this study points to the need to educate and persuade women of the importance of staying pregnant until 39 weeks. In this study, the women's views on birth before 39 weeks echoed other, larger studies that have shown that women do not appreciate the risks of giving birth before 39 weeks (Goldenberg et al., 2009). In addition, this study provides an explanation as to why women see preterm births (those before 35 weeks) as bad but early term births were seen acceptable and sometimes desired. The analysis suggests that women's evaluations of early birth can be influenced using information about brain development in the final weeks of

pregnancy. However, further study is needed to assess how these messages should be constructed and presented.

Conclusion

The findings from this study suggest that women often ask for c-sections or inductions before 39 weeks of pregnancy, but that the decision to induce or have a c-section is one that is made in conjunction with their providers, a joint negotiation of what different risks mean and what is best for the baby and mother. The women in this study translated medical knowledge of their due dates as an uncertainty and regarded their due dates as uncertain, a plus or minus two weeks. They constructed this uncertainty as both justification for inducing or having a c-section before 39 weeks and as a reason to wait until their babies and their bodies decided it was time to give birth. How the women constructed this uncertainty depended on their probabilistic and evaluative orientations toward the length of a pregnancy.

These findings are limited, however, by the small number of women involved in the study who had elective inductions or c-sections before 39 weeks, although it included several who had seriously considered one. This may be because these women are difficult to identify, and it may be because of the low incentive offered for participation. In addition, it may be that women who are eager to discuss their birth experiences and pregnancies were more likely to participate in this study, and these women may be qualitatively different from women who are less eager to share.

The findings suggest several areas for future research. First, more work needs to be done to understand how providers engage women when they ask for inductions or c-sections. It may be that examining this negotiation from the providers' standpoint could provide better guidance for providers on how to handle patients who want early inductions or c-sections. Second, the role that partners play in this decision should be examined. Third, the finding of the influence of the brain card, while promising, may be limited to certain populations of women. A larger, quantitative study is needed to examine the brain card's persuasive appeal in a larger population. Finally, the analysis suggests that uncertainty may also be axiological in nature. More research is needed to further define axiological uncertainty and elucidate its role in decision-making.

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FIGURE 1.

Healthy Babies are Worth the Wait Brain Card, side one. Johnson and Johnson Pediatric Institute, LLC, and March of Dimes Foundation. Side two is available from the first author upon request (color figure available online).

FIGURE 2.

A model of how women decide when to give birth, using problematic integration theory.