
Seeing Is Committing: A Longitudinal Study of Bolstering Commitment in Amniocentesis Patients

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*In the face of a challenge to one's commitment, situational factors may focus attention on aspects of the commitment that bolster the commitment. Forty-six women were interviewed at four times: immediately before (1) and after (2) ultrasound and amniocentesis procedures and a few days before (3) and after (4) receiving amniocentesis test results. Number of fetal parts seen by the woman during the ultrasound examination predicted degree of commitment at Time 3, controlling for Time 1 assessments of commitment and perceived choice about becoming pregnant. Choice was associated with commitment at Time 1 but not at Time 3. Three dimensions of commitment were explored—*affective, behavioral, and cognitive*. Number of fetal parts seen predicted changes in affective and behavioral commitment from Time 1 to Time 3. Cognitive commitment decreased while women awaited test results, particularly in planned pregnancies—but less so for women who saw more fetal parts. The choice-commitment relation and the multidimensionality of commitment are discussed.*

A review of theory and research on commitment reveals a diversity of ways of conceptualizing this concept. Some have emphasized a rational decision-making approach to commitment (e.g., Lund, 1985; Rusbult, 1983). Others have emphasized that commitment is an expression of the self (Kanter, 1972; Kobasa, 1982; Lydon & Zanna, 1990; Mayer, Duval, & Duval, 1980). Many have explored the multidimensionality of commitment (e.g., Johnson, 1991; Kanter, 1968; Mathieu & Zajac, 1990; Novacek & Lazarus, 1990; Reilly & Orsak, 1990). Despite this diversity of foci, commitment researchers generally share a definition of commitment as a state of feeling tied to or bound to someone or something (e.g., Kiesler & Sakumura, 1966; Mayer et al., 1980).

In addition to the diversity of approaches to the study of commitment, researchers have demonstrated a diverse array of variables influencing attitudinal and behavioral indicators of commitment. For example, we have learned that the publicness of one's attitude influences the degree of commitment (Kiesler, 1971), an effect consistent with social phenomena such as marital engagements or wedding ceremonies. Moreover, people escalate their commitment when they feel personally responsible for a failing course of action (Fox & Staw, 1979; Staw, 1976). This effect has been used to explain sustained U.S. involvement in the Vietnam War and the inability of "trapped administrators" (Campbell, 1969) to terminate failing social or financial investments (see Staw & Ross, 1989; Teger, 1980). A similar model, an investment model, has accounted for reports of commitments to dating partners (Rusbult, 1983), marital partners (Rusbult, Johnson, & Morrow, 1986), and organizations (Farrell & Rusbult, 1981) when sunken costs (Becker, 1960) or "investments" are great.

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THREATS TO A COMMITMENT

Although most commitment research has examined how people first become committed, some attention has also been given to factors influencing changes in commitment when challenges or threats to one's commitment occur. In the interpersonal relationships literature, the focus has been on the dissolution of commitment in response to challenges and threats (Duck, 1982). In the attitude literature, Kiesler, Roth, and Pallak (1974) found that people may avoid or reinterpret the implications of their commitment when threatened. In the health domain, Beeson and Golbus (1979) found that, during the period of waiting for test results, amniocentesis patients reported hiding physical changes, avoiding maternity clothes, and not discussing their pregnancy. The researchers referred to this as a "suspension of commitment to the pregnancy" while women awaited news that their babies were normal.

The question we set out to address is: When a commitment is threatened, do specific situational factors facilitate the maintenance and growth of that commitment? Lydon and Zanna (1990) found that personal projects that *at the outset* expressed a person's core values and self-conceptions were those that an individual subsequently remained committed to in the face of adversity. However, they noted the need for future research to identify intervening variables that influence changes in the development of commitment, particularly when people may be trying to avoid or reinterpret value-laden commitments.

Lydon and Zanna (1990) further proposed that the salience of the commitment object may be a situational factor influencing the development of commitment. However, in some sense this begs the question of what, exactly, is being made salient. Here we drew on the theoretical work of Brickman, Dunkel-Schetter, and Abbey (1987) in their dialectical model of the development of commitment. They theorized that people may focus attention on the positive aspects of a commitment object at the outset but subsequently shift attention to the negative aspects of the object of the commitment (e.g., after the honeymoon). Commitment develops, they suggested, when one successfully synthesizes the negative with the positive aspects of the object of the commitment (e.g., "It's okay that he looks like Woody Allen instead of Kevin Costner, because he loves me so much").

We reasoned that attention to positive aspects of one's commitment may increase commitment. Conversely, attention to negative aspects of one's commitment may undermine commitment. Moreover, a commitment-threatening situation may exacerbate these effects, so that attention to positive aspects provides reassurance while attention to negative aspects heightens the threat. Interestingly, a person may be presented with a situation

that emphasizes features of a commitment object that are neither inherently positive nor negative in the context of the threat. In such instances, the nature and strength of the commitment prior to the threat may predispose one to interpret and evaluate specific features of the commitment object in ways that bolster the commitment. Focusing attention on specific features of a commitment object at a time of threat and uncertainty may serve to concretize and make more tangible a commitment that has previously been abstract. Thus, focusing attention on even ambiguous features of a commitment object may then be imbued with a positive meaning that can foster increased commitment. A population of women undergoing amniocentesis was studied to test this idea.¹

AMNIOCENTESIS

Amniocentesis patients serve as an especially good naturalistic population for studying the development of commitment under threat. On the whole, these are women who want their babies. The most common reason for an amniocentesis is advanced maternal age (35 years or older), the potential for Down's syndrome (trisomy-21) being the major concern. Rates of positive test results are 1-8%, depending on age, from 35 to 45 years. Although this rate of Down's syndrome is low, the possibility of abnormalities is quite real and anxiety provoking for a woman. One amniocentesis patient described the risk factor by stating, "Although I took comfort in the favorable statistics of having a normal newborn, the old medical truism kept going through my head. 'The 4% is 100% if the case turns out to be you' " (Brewster, 1984, p. 444).

The psychologically threatening nature of this situation—that is, the possibility of abnormalities and its challenge to a commitment—is suggested by reports of increased anxiety experienced by women awaiting the results of their amniocentesis (Beeson & Golbus, 1979; Phipps & Zinn, 1986). In the Phipps and Zinn (1986) study, for example, amniocentesis patients at risk owing to age reported more anxiety immediately following an amniocentesis (with an accompanying ultrasonography) than somewhat younger women at a similar phase of gestation who were not having an amniocentesis. In light of the anxiety of awaiting amniocentesis test results, it is not surprising that Beeson and Golbus (1979) report that women also attempt to suspend their commitment to the pregnancy during the period of awaiting test results.

In sum, the literature suggests that an amniocentesis may prompt cognitive and behavioral attempts to avoid, reinterpret, or delay commitment. However, because women undergoing amniocentesis have already been

through the first trimester of pregnancy, they are, in some sense, already fairly committed to their pregnancy. Consequently, we theorized that they are a population predisposed to find positive meaning in even ambiguous or neutral features of a commitment object. We further proposed that attention to specific features of the commitment object would be an especially important factor in bolstering commitment and predicting changes in commitment during the period of uncertainty and threat. The practice of having women view their ultrasonography just before their amniocentesis provided us with a way to operationalize the concretizing of an abstract commitment object—that is, the fetus. We hypothesized that the number of fetal parts seen on the screen would predict changes in the degree of commitment after the procedure and during the uncertain period of awaiting test results even though how much women see on the screen during their ultrasound examination is not diagnostic of amniocentesis test results.

Although the focus of this research is on a situational variable that may predict responses to a powerful challenge or threat to a commitment, we expect that other, distal variables will be associated with the level of commitment, especially prior to threat. Because choice is a variable of conceptual relevance in the commitment literature (Brickman, 1987; Kiesler, 1971) and in the literature on pregnancy decision making (Major, Mueller, & Hildebrandt, 1985), we chose to assess choice as one distal factor relating to the commitment of women prior to the ultrasound and amniocentesis procedure. Consistent with experimental findings that perceived choice may increase commitment, we predicted that perceived choice would be positively associated with commitment before the ultrasound and amniocentesis.

Finally, the commitment literature frequently conceptualizes commitment as a multidimensional construct. However, the number of dimensions and the conceptualizations of the dimensions vary considerably. Therefore, we chose to use a variety of measures of pregnant women's prenatal attitudes and attachments in order to conduct an exploratory factor analysis to examine dimensions within the global construct of commitment. Although we thought it important to explore potential dimensions of commitment, we treated such dimensions as speculative and used them only to support, and thereby possibly to clarify, findings related to our predictions about commitment in general.

METHOD

Overview

Amniocentesis patients were interviewed at four time points: (1) at the amniocentesis clinic immediately before their ultrasonography and amniocentesis; (2) the

same day at the clinic after their ultrasonography and amniocentesis; (3) by telephone 7 to 10 days after the amniocentesis (before receiving test results); and (4) by telephone 2 to 7 days after receiving normal test results. Commitment was assessed at Time 1 and Time 3, perceived choice was assessed at Time 1, and ultrasound viewing was assessed at Time 2. A subset of commitment items was administered at Time 4.

Subjects

Criteria. Women in their fourth month of pregnancy who were having their first amniocentesis for advanced maternal age were invited to participate in the study. Women undergoing amniocentesis because of family history or because of the results of an earlier alpha-fetoprotein (AFP) test (an initial screening test for neural tube defects) were not eligible.² Women were also deemed ineligible if they had undergone infertility treatment, if they were not fluent enough in English to complete questionnaires, or if they came to the clinic too early for an amniocentesis.

Recruitment. Sixty-two women meeting these criteria were invited to participate, and 61 of the 62 consented to participate. Two of the 61 women subsequently dropped out. Eight subjects were eliminated from the sample because of medical problems arising (including one fetal demise), and 1 was eliminated because she was having twins. Four subjects were unable to complete the first questionnaire before their ultrasound examination. Thus, 46 of the 49 women who (a) were having one baby, (b) were without medical problems, and (c) were not late for their ultrasound examination agreed to participate in the study and subsequently remained in the study through all four time points.

Sample. Twenty-one primiparous and 25 multiparous women constituted the sample. Subjects were primarily White (80%), employed (74%), and married (94%), with at least a college degree (70%). Their ages ranged from 27 to 43 ($M = 37$), and their weeks of gestation ranged from 14 to 20 ($M = 16.24$, $SD = 1.13$).

Materials

Commitment was operationalized with three prenatal attachment scales and three additional items we generated for this study. One scale consisted of eight adjectives rated on a 7-point scale in terms of feelings about the fetus (*secure, uncertain, confident, ambivalent, attached, loving, maternal, concerned*; A. E. Reading, personal communication, 1987). An earlier nine-item version of this measure of attitudes toward the fetus (Reading, Cox, Sledmere, & Campbell, 1984) was reported to have high internal consistency. Moreover, assessments at both 16 weeks gestation and 32 weeks gestation were reliable

predictors of attachment to the neonate at delivery (Reading et al., 1984). Ten items from the Antenatal Bonding Questionnaire (Condon, 1985) were used because they loaded most heavily on an attachment factor from an exploratory factor analysis of the original 46-item questionnaire (J. Condon, personal communication, August 11, 1987). One item stated, for example, "Over the past two weeks, I have been trying to picture in my mind what the developing baby looks like in my womb (1, *not at all*—5, *almost all the time*)." The third scale, the Maternal-Fetal Attachment Scale (Cranley, 1981), consisted of 24 items designed to assess "the extent to which women engage in behaviors that represent an affiliation and interaction with their unborn child" (Cranley, 1981, p. 282). One item stated, for example, "I poke the baby to get him/her to poke back (1, *definitely no*—5, *definitely yes*)." Cranley reported that the scale was internally consistent (Cronbach alpha = .85).

The three additional items were (a) "How attached do you feel to your baby right now?," (b) "How committed do you feel to this pregnancy right now?," and (c) "If the test results from your amniocentesis are abnormal you will (1, *definitely choose abortion*—5, *definitely not choose abortion*)." .

Because commitment has often been conceptualized as multidimensional (see Brickman, 1987; Johnson, 1991; Lydon & Zanna, 1990; Mathieu & Zajac, 1990; Meyer & Allen, 1984), standardized responses to the commitment items at Time 1 ($N = 57$) were entered in a principal components analysis with an oblique rotation. A three-factor solution was found,³ and the items assigned to each factor were analyzed for their internal consistency. Reliability analyses revealed three internally consistent, reliable indexes.

The first factor, which represented the affective aspects of commitment to the pregnancy, had a Cronbach alpha of .88. Those high in affective commitment felt more loving, secure, maternal, attached, and committed to the fetus. They had more positive, happy feelings, more tender thoughts, more closeness to the fetus, and more confidence about the fetus. They were less uncertain, less ambivalent, and less concerned about the fetus, and they thought that they would feel more sadness if they lost the pregnancy.

The second factor represented the physical and behavioral aspects of commitment and had a Cronbach alpha of .78. Those high in behavioral commitment were more likely to report poking the baby, grasping the baby's foot, stroking their stomach to quiet the baby and talking to the baby. They reported that they enjoyed the baby kicking, that the baby would kick to tell them it was eating time, that they could tell the baby had hiccoughs, and that they could guess the baby's personality. They were also more likely to have a name for a boy and for a

girl, to wonder whether the baby could hear and think and feel inside, and to want to hold the baby immediately at birth.

The third factor included cognitive aspects of commitment and had an alpha of .78.⁴ Those high in cognitive commitment were more likely to picture what the developing baby looked like. They pictured themselves feeding the baby, pictured what the baby would look like, imagined taking care of the baby, and could hardly wait to hold the baby. They also reported doing things to stay healthy, eating for the baby's diet, and giving up certain things for the baby. Finally, they had a greater desire to read about having a baby.

Attention to aspects of the commitment object was measured by assessing women's perceptions of their ultrasonography before leaving the clinic the day of the ultrasound. Women were asked (yes/no) whether they had seen (a) heart beating, (b) face, (c) head, (d) spine/backbone, (e) arms/legs, (f) hands/feet, and (g) body moving. Higher scores (seeing more parts of the fetus/baby) were expected to reflect the degree to which the ultrasound reminded the women or made them more aware of specific features of their commitment object that might serve to concretize and bolster their commitment during a time of threat and uncertainty.

Perceived choice was measured at Time 1 by asking subjects "To what extent was this pregnancy planned?" (1 = *actively trying to prevent pregnancy*, 2 = *not actively trying to become pregnant or to prevent it*, 3 = *actively trying to become pregnant*). Subjects' responses to this question were used to establish three levels of choice in becoming pregnant. Additional measures included for exploratory purposes were the State Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970) and a subset of 20 items from the Affect Balance Scale (Derogatis, 1975).

Procedure

Time 1. Women who, on screening, met the criteria for the study were informed that the study involved an assessment of psychological reactions to amniocentesis and that they would be interviewed before and after their amniocentesis that day and by telephone in a week or so and finally by telephone 1-3 days after receiving their test results. After signing the informed consent form, subjects received the first questionnaire packet and were asked to fill it out while waiting for their ultrasound exam. The packet took approximately 15 min to complete and included all the commitment items, the State Anxiety Inventory, the Affect Balance Scale, and the one item used to categorize three levels of choice. (See Goldman, 1989, for the complete questionnaire.)

Ultrasound and amniocentesis. The ultrasound exam consisted of the ultrasonographer's taking measurements of various fetal parts (e.g., head, spine) and assess-

ing fetal development using real-time ultrasound, which provided a two-dimensional image of the fetus. Fetal movement was visible to the subject in 98% of the cases studied. The ultrasound exam lasted an average of 42 min ($SD = 10$ min; range = 15-65 min). Subsequently, a physician performed an amniotic tap, inserting a needle to extract amniotic fluid.

Time 2. Immediately after the amniocentesis, the subject received a second questionnaire that took approximately 10 min to complete. The number of fetal parts seen on the screen during the ultrasound was assessed at this time, as well as anxiety and positive and negative affects. After completion of the questionnaire, the researcher reminded the subject that she would be contacted by telephone in a week, and tentative days and times were set.

Time 3. Subjects were telephoned 7 to 10 days after their amniocentesis (about 1 week before receiving test results) and received a 15-min interview from a doctoral candidate in clinical psychology with extensive clinical experience. All questions about commitment, anxiety, and affect from Time 1 were repeated.

Time 4. Results of the amniocentesis were obtained from Prenatal Diagnostic Services, and subjects were screened for test results. All subjects in the Time 1-Time 3 sample had normal test results and subsequently received a 30-min telephone interview. For the most part, Time 4 consisted of a semistructured interview about women's retrospections on the ultrasound and amniocentesis procedures and the kind of care they received. However, subjects were also asked about their general affective states (Affect Balance Scale). A subset of the Time 1, Time 3 commitment questions were asked (8 adjectives, 10 items from the Antenatal Bonding Questionnaire, and 2 additional items concerning attachment and commitment). The Cranley 24-item scale and the intention-to-abort question were not administered. Subjects were thanked for their participation, and an offer was made to send them the results of the study.

Summary. Thus, the predictor variable, fetal parts seen during the ultrasound, was assessed at Time 2 ($M = 6.5$, $SD = 0.74$) to predict commitment at Time 3. By measuring commitment at Time 1 and entering it first in a hierarchical regression, we can ascertain whether the ultrasound viewing was associated with changes in commitment while women awaited test results. Because of the restricted range of the ultrasound measure, its ability to predict commitment was limited, thus creating a rather conservative test of our hypothesis. Commitment at Time 1 was expected to correlate with the distal factor of perceived choice, but this relationship was expected

to decrease by Time 3 because of the powerful situations of viewing the ultrasound and awaiting test results. Given that choice was a categorical variable, analysis of variance was the preferred data-analytic strategy for examining this particular variable.

RESULTS

Measures of Commitment

Subjects' responses to all 45 commitment items were standardized and averaged to form a global measure of commitment ($\alpha = .86$). Measures of affective, behavioral, and cognitive commitment were generated in a similar fashion. For repeated-measures analyses, raw scores were adjusted to 5-point scales and averaged for each index.

Perceived Choice and Changes in Commitment

To examine whether there were any main effect changes in commitment over time and whether such changes were moderated by perceived choice, a 3 (Choice: low, moderate, high) \times 2 (Interview: Time 1, Time 3) between-within ANOVA was performed using the global commitment measure. There were no reliable effects for commitment as a function of time, $F(1, 43) = 2.71$, $p > .10$, choice, $F(2, 43) = 2.54$, $p < .10$, or the interaction of choice by time, $F(2, 43) = 2.27$, $p > .10$.

To explore the three dimensions of commitment, a 3 (Choice: low, moderate, high) \times 2 (Interview: Time 1, Time 3) between-within MANOVA was performed with affective, behavioral, and cognitive commitment as the three univariates. Using the Pillais V statistic (Olson, 1976), marginal between-subjects differences for choice, $V = .25$, $F(6, 84) = 2.01$, $p < .10$, and within-subjects differences for time, $V = .16$, $F(3, 41) = 2.53$, $p < .10$, were qualified by a choice by time interaction, $V = .29$, $F(6, 84) = 2.37$, $p < .05$. Examination of the univariate results revealed that the interaction was due to cognitive commitment, $F(2, 43) = 4.39$, $p < .02$. As shown in Table 1, those actively planning to get pregnant (high-choice group) reported more cognitive commitment at Time 1 ($M[28] = 4.43$) than either the moderate-choice group ($M[12] = 4.17$), $t(43) = 3.44$, $p < .01$, or the low-choice group ($M[6] = 3.86$), $t(43) = 5.78$, $p < .001$. But cognitive commitment decreased for the high-choice group from Time 1 ($M[28] = 4.43$) to Time 3 ($M[28] = 4.17$), $t(43) = 4.44$, $p < .001$, and no longer differed reliably from commitment in the moderate-choice group ($M[12] = 4.11$), $t < 1$. The high-choice group still tended to differ from the low-choice group at Time 3 ($M[6] = 3.97$), $t(43) = 2.03$, $p < .05$. However, when the Bonferroni procedure was used for all the cognitive commitment comparisons, this particular comparison was no longer

Table 1: Mean Commitment Scores as a Function of Choice and Time

Commitment Measure	Choice			Overall
	Low	Moderate	High	
Global				
Time 1	3.51	3.52	3.77	3.67
Time 3	3.67	3.59	3.73	3.69
Affective				
Time 1	4.02	3.66	4.22	4.05 ^a
Time 3	4.32	3.98	4.25	4.19 ^b
Behavioral				
Time 1	2.94	2.94	2.94	2.94
Time 3	2.92	2.94	2.99	2.97
Cognitive				
Time 1	3.86 ^a	4.17 ^b	4.43 ^c	4.29
Time 3	3.97	4.11	4.17 ^b	4.13
<i>n</i>	6	12	28	

NOTE: Scores could range from 1 (low commitment) to 5 (high commitment). Row means with different subscripts are reliably different ($p < .05$ with Bonferroni procedure). Column means with different superscripts are similarly different.

reliable, whereas the other comparisons reported above remained reliable.

In contrast to the interaction effects for cognitive commitment, there was a main effect increase in affective commitment from Time 1 ($M = 4.05$) to Time 3 ($M = 4.19$), $F(1, 43) = 6.23$, $p < .02$. There was also some tendency for affective commitment to differ as a function of choice, $F(2, 43) = 3.11$, $p < .10$, although, curiously, this appears to be due to low levels of affective commitment in the moderate-choice group ($M = 3.82$) compared with the high-choice ($M = 4.23$) and low-choice ($M = 4.17$) groups. There was no reliable interaction between time and choice for affective commitment, $F(2, 43) = 1.86$, $p > .10$. There were also no main effects nor an interaction for behavioral commitment, all $F_s < 1$.

In summary, commitment in general (the global measure) did *not decrease* while women awaited test results. Moreover, the affective component of commitment increased during the waiting period. In contrast, the cognitive component of commitment decreased during the waiting period but only among those who had actively planned to get pregnant. Finally, choice was related to commitment at Time 1, $r(44) = .39$, $p < .02$, but not at Time 3, $r(44) = .18$, *n.s.*

Ultrasound Viewing

The question then was whether the number of fetal parts seen during the ultrasound procedure could account for variance in commitment during the waiting period, independent of baseline (Time 1) commitment and perceived choice. The number of fetal parts seen by the subjects during their ultrasound was summed and treated as an index of attention to the commitment object.⁵

Hierarchical regression analyses were performed using Time 3 commitment indices as the criteria. In Step 1, perceived choice and Time 1 global commitment were entered as predictors of Time 3 global commitment. In Step 2, ultrasound viewing was entered to ascertain whether the ultrasound could explain changes in commitment during this interval independent of choice. As seen in Table 2, the ultrasound measure accounted for significant changes in global commitment from Time 1 to Time 3 independent of perceived choice, beta (β) = .36, semipartial correlation (sr)(39) = .34, $p < .01$.

Consistent with the results on commitment in general, ultrasound viewing also accounted for significant changes in affective commitment independent of perceived choice, $\beta = .28$, $sr(39) = .28$, $p < .01$. In addition, the ultrasound measure accounted for significant changes in behavioral commitment independent of perceived choice, $\beta = .28$, $sr(39) = .26$, $p < .02$. However, the relationship between the ultrasound and Time 3 cognitive commitment, controlling for perceived choice and Time 1 cognitive commitment, was not reliable, $\beta = .22$, $sr(39) = .21$, $p < .10$.

Reasonable alternative explanations for the ultrasound-commitment results are that women who saw more on the screen may have been more advanced in their pregnancy or may have seen the ultrasound for a longer duration. However, the number of weeks of gestation was not related to commitment, $r = .01$, nor was the duration of the ultrasound related to commitment, $r = .02$. Not surprisingly, then, entering these variables prior to the ultrasound measure in the regression analyses did not account for the ultrasound-commitment relation.

Although ultrasound viewing predicted changes in commitment, the analyses above do not examine ultrasound viewing in terms of the locus of mean-level changes in commitment. Therefore, we dichotomized the ultrasound measure: 28 subjects saw all seven fetal parts and 14 saw six or fewer parts. We then performed a two-way repeated-measures analysis on the global commitment index (Time 1, Time 3 by Ultrasound Viewing [high vs. low]). The main effect for ultrasound viewing, $F(1, 40) = 7.52$, $p < .01$, was qualified by a time by ultrasound interaction, $F(1, 40) = 5.07$, $p < .05$. Those who reported seeing all seven fetal parts subsequently reported a small but reliable increase in commitment (Time 1 $M[28] = 3.7$ vs. Time 3 $M[28] = 3.8$), $t(40) = 2.12$, $p < .05$. Those who saw fewer than seven parts tended to report less commitment subsequently (Time 1 $M[14] = 3.56$ vs. Time 3 $M[14] = 3.47$), but this was not a reliable difference, $t(40) = 1.35$, *n.s.* There was also a corresponding time by ultrasound interaction when the three commitment factors were examined as a second within-subjects factor, $F(1, 40) = 4.68$, $p < .05$. The reliable

TABLE 2: Summary of Hierarchical Multiple Regression Analyses

	R ²	ΔR ²	Zero-Order r	Beta
<i>Criterion</i>				
Global commitment (Time 3)				
Step 1:	.53	.53**		
Global commitment (Time 1)			.72	.77**
Choice (Time 1)			.18	-.12
Step 2:	.65	.12**		
Fetal parts seen (Time 2)			.56	.36**
<i>Criterion</i>				
Affective commitment (Time 3)				
Step 1:	.57	.57**		
Affective commitment (Time 1)			.75	.78**
Choice (Time 1)			.13	.10
Step 2:	.65	.08**		
Fetal parts seen (Time 2)			.40	.28**
<i>Criterion</i>				
Behavioral commitment (Time 3)				
Step 1:	.54	.54**		
Behavioral commitment (Time 1)			.73	.73**
Choice (Time 1)			.06	.07
Step 2:	.61	.07*		
Fetal parts seen (Time 2)			.50	.28*
<i>Criterion</i>				
Cognitive commitment (Time 3)				
Step 1:	.46	.46**		
Cognitive commitment (Time 1)			.65	.77**
Choice (Time 1)			.17	-.23 [†]
Step 2:	.51	.04 [†]		
Fetal parts seen (Time 2)			.36	.22 [†]

[†] $p < .10$; * $p < .05$; ** $p < .01$.

increase in commitment in the high-ultrasound group was specific to affective commitment (Time 1 $M = 4.06$ vs. Time 3 $M = 4.27$), $t(40) = 2.48$, $p < .02$. The trend for commitment to decrease among the low-ultrasound group only approached significance for cognitive commitment (Time 1 $M = 4.12$ vs. Time 3 $M = 3.90$), $t(40) = 1.84$, $p < .10$.

DISCUSSION

These results provide some empirical support for our hypotheses. First, the measure of the number of fetal parts seen during an ultrasound examination predicted changes in commitment during a time of challenge and threat—that is, when women were waiting for amniocentesis test results. This result held even after controlling for perceived choice. Second, we found that perceived choice was associated with commitment at Time 1, as expected, although choice was not associated with commitment at Time 3, as predicted. Finally, our exploratory analyses of commitment dimensions revealed different patterns of relationships among variables depending on the type of commitment measured. Affective commit-

ment increased during the waiting period. In contrast, cognitive commitment decreased at this time for high-choice women while it remained stable for low- and moderate-choice women. Moreover, fetal parts seen predicted changes in affective commitment and behavioral commitment while women waited for test results, but it was less reliably associated with changes in cognitive commitment.

Considering Alternative Explanations

These results are consistent with our theoretical premise that observing specific aspects of the object of a commitment bolsters commitment. However, an alternative is that failing to see many specific features of the fetus could have undermined commitment relative to those not seeing their ultrasound. Unfortunately, because it has become a routine procedure for women to view their ultrasonography prior to an amniocentesis, having a baseline control group without ultrasound viewing was not possible. Whether such a control group would report less commitment while awaiting test results than those who viewed their ultrasound cannot be determined. We did find a small but reliable increase in commitment for

those who saw all seven fetal parts, particularly in affective commitment. It should also be noted that there was a trend for commitment to decrease among those who did not see all seven parts, particularly cognitive commitment. It is possible that had this group not seen their ultrasound at all, their commitment might have declined even more while they awaited their amniocentesis test results.

A natural concern about this study is that its nonexperimental design does not permit inferring causal direction, and third-variable causation cannot be ruled out. We addressed the directionality problem, in part, by controlling for commitment at Time 1 and demonstrating that ultrasound viewing predicted unique variance in commitment at Time 3. Potential third variables such as weeks of gestation, duration of the ultrasound, and perceived choice were also controlled. Of course there are other potential third variables that were not within the limits and scope of this study. Note, though, that, in searching for a third variable, one needs to identify a variable that accounts for variance shared between ultrasound viewing at Time 2 and commitment at Time 3 that is also *not* shared with commitment at Time 1 (because we already controlled for Time 1 commitment).

Why Ultrasound May Bolster Commitment

By using a longitudinal design and statistical controls, we were able to strengthen our investigation. However, our basic findings prompt questions about the mechanisms underlying this set of results. Because an amniocentesis creates a powerfully uncertain and threatening situation, we suggest that women will typically have thoughts and feelings challenging their commitment. Moreover, the object of the commitment is still abstract for many women. The ultrasound presents an opportunity to see, attend to, and be reminded of specific features of one's commitment. Although seeing the fetus on the screen is not diagnostic of amniocentesis test results, nonetheless, it may reassure women during this time of uncertainty by making their commitment more tangible and concrete. The ultrasound may then bolster their commitment. However, the number of fetal parts seen was also positively correlated with commitment at Time 1, $r(40) = .32, p < .05$. Thus the impact of focusing attention on specific aspects of one's commitment may be greater for those somewhat more predisposed to see aspects of their commitment object and then interpret their viewing as positive. In this respect, an ultrasound may bolster (Fazio & Zanna, 1981) or even polarize (Tesser, 1978) favorable attitudes that have been temporarily weakened because of threat or uncertainty.

Choice-Commitment Relation

The power of the situation (waiting for test results about birth defects) may also account for the relationship between choice and commitment. Derived from a theory of cognitive dissonance, commitment theory and research suggest that people will feel especially committed to a course of action that they perceive themselves to have freely chosen and, in turn, feel personally responsible for. In this study, choice was positively related to commitment before the ultrasound and amniocentesis. However, a powerful feature of the situation, the clarity of the ultrasound, predicted changes in commitment in general and on dimensions of commitment that choice did not predict. Moreover, a close examination of the decreased cognitive commitment in the choice by time interaction revealed that those who had actively tried to get pregnant (high choice) were more cognitively committed than others *until* the ultrasound and amniocentesis procedure. At Time 3, their reports of commitment were no longer reliably different. As Snyder and Ickes (1985) noted, powerful, "strong" situations may acutely obscure stable and chronic influences of other variables. We expect that perceived choice will typically predict commitment in the absence of strong situations that engulf the field (see Heider, 1958; Quattrone, 1982) such as the ultrasound and amniocentesis procedures.

Future Directions

Our charting of the development of commitment will remain incomplete until we establish better how feelings of commitment influence other processes, such as behavioral persistence. It is incumbent on commitment researchers to examine the links between attitudinal and behavioral aspects of commitment. In the context of pregnancy, for example, we can examine the relation between attitudinal commitment and prenatal health behaviors (e.g., diet, exercise, alcohol and drug use). Further extending these links would be an examination of birth outcomes (e.g., birth weight, gestational age, Apgar scores) and mother-infant attachment as a function of prenatal commitment. In this vein, studying commitment in the context of pregnancy advances our understanding of psychological processes in pregnancy. It also reveals pregnancy as an especially fruitful context for studying social psychological processes in general and commitment processes in particular.

In sum, this study investigated an interesting naturally occurring commitment phenomenon using a unique field setting for a carefully designed longitudinal study. In so doing, the study suggests the potential power of situational factors to focus attention on a commitment object and thereby possibly influence the degree of

commitment in situations of major life importance, in this case by bolstering it. Future research addressing social psychological processes implicated in commitment under uncertainty may advance both theory and application as we continue to elaborate on our understanding of the psychology of commitment.

NOTES

1. The commitment hypothesis was examined in the context of a broad-based study of the psychological aspects of amniocentesis that was designed primarily to test for changes in anxiety and commitment as a result of medical procedures (see also Goldman, 1989).

2. This reduced the heterogeneity of our sample, increasing our power to detect reliable sets of relations between variables. Note that advanced maternal age is the most common reason for women to undergo an amniocentesis.

3. The analysis generated three factors with eigenvalues greater than 4.0. Additional factors had eigenvalues less than 3.0 (e.g., 4 = 2.9, 5 = 2.6, 6 = 2.2). Moreover, the scree test revealed a distinct break between the third and fourth factors. Given (a) a basis in the literature for two or three factors, (b) a relatively small sample size for factor analysis, and (c) the exploratory nature of the factor analysis, we chose to be conservative in the number of factors we interpreted. Consequently, a principal components analysis was performed with a constraint of three factors. The analysis produced three independent factors (all interfactor r s < .10). Items were assigned to a factor if (a) the factor loading was at least + or -.30 and (b) the loading was at least .05 greater than its loading on another factor. Four items met the first criterion but not the second and therefore were assigned to factors on a theoretical basis. Four items did not meet the first criterion and were discarded. Detailed results are available from the first author on request.

4. This study was not designed expressly to ascertain the psychometric properties of prenatal commitment and construct corresponding scales. However, it was felt that our psychometric work would increase the reliability and validity of existing scales by integrating and reorganizing them in a theoretically and empirically based fashion.

5. Four women failed to answer one or more of these seven questions and were deleted from the analyses.

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