Feeling in Control During Labor: Concepts, Correlates, and Consequences

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ABSTRACT: Background: *Many studies have revealed that a sense of control is a major contributing factor to a woman's birth experience and her subsequent well-being. Since not all studies conceptualize "control" in the same way or distinguish between "external" and "internal" control, the purpose of this study is to advance understanding of how these senses of control relate to each other.* **Methods:** *Questionnaires were sent to women 1 month before birth to assess their preferences and expectations and at 6 weeks after birth to discover their experiences and assess psychological outcomes. Data are presented from 1146 women. Three control outcomes were considered: feeling in control of what staff do to you, feeling in control of your own behavior, and feeling in control during contractions.* **Results:** *Women were less likely to report being in control of staff (39.5%) than in control of their own behavior (61.0%). Approximately one-fifth of the sample felt in control in all three ways, and another one-fifth did not feel in control in any of them. Parity was strongly associated with feeling in control, with multiparas feeling more in control than primiparas in all cases. In logistic regression analyses, feeling in control of staff was found to relate primarily to being able to get comfortable, feeling treated with respect and as an individual, and perceiving staff as considerate. Feeling in control of one's behavior and during contractions were primarily related to aspects of pain and pain relief, but also to antenatal expectations of control. Worry about labor pain was also an important antenatal predictor for primiparas. All three control outcomes contributed independently to satisfaction, with control of staff being the most significant; relationships with emotional well-being were also demonstrated.* **Conclusions:** *All three types of control were important to women and contributed to psychological outcomes. Internal and external control were predicted by different groups of variables. Caregivers have the potential to make a significant difference to a woman's experience of childbirth. The ways in which women are helped to deal with pain will affect internal control; the extent to which they feel that they are actually cared about, rather than care being something that is done to them, will affect external control. Both contribute to satisfaction and emotional well-being. (BIRTH 30:4 December 2003)*

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Many studies have now revealed that a sense of control is a major factor contributing to a woman's birth experience and her subsequent well-being (1–9). This finding is an important step in an understanding of the psychosocial aspects of childbirth. However, many questions remain. Not all studies conceptualize "control" in the same way. In particular, the word is often used to refer to "external" control (control over what is done to you), often equated with involvement in decision-making. It may also mean "internal" control (control of your body and behavior). Since

the distinction between internal and external control is rarely made, little is known about how these senses of control relate to each other.

The Great Expectations study (5,6), conducted in 4 areas in the south of England in 1987, explicitly addressed some of these issues by considering 6 different conceptualizations of control, and investigating how both the expectations and experiences of these related to psychological outcomes in women of different parity and levels of education. Three were considered to be "internal" (control of behavior, control during contractions, making a noise) and 3 "external" (feeling in control of what staff do to you, involvement in nonemergency decision-making, involvement in emergency decision-making). In brief, the study found that 5 of the 6 definitions of control were important to most women (the exception being "making a noise"), and that feeling in control in any of these senses was associated with positive psychological outcomes, irrespective of education, parity, or the importance afforded to control antenatally. Women who reported antenatally that they expected to be in control were most likely to report that they were.

Several other studies also have attempted to explore what "control" means to women in labor. External control, specifically involvement in decision-making, is the most frequently encountered (10–12). Waldenström offers a slightly different conceptualization of external control—perceived involvement in the birth process (being a "subject" not an "object") as the strongest predictor of a positive birth experience (13).

Other studies also have considered conceptualizations of internal control. Slade et al highlighted the ability to control panic, and postulated this as the mechanism for the efficacy of breathing and relaxation exercises (14). In a descriptive study to identify the major concerns of new mothers, women were asked an open question, "Is anything about your labor and delivery still bothering you?" (15). Lack of control over body movements and decisions about intervention in labor both featured strongly in their responses and were related to negative perceptions of the caregivers.

The conceptualization of external control as involvement in decision-making is sometimes used uncritically without tackling the issue of whether such involvement necessarily leads to control or whether some women might, in fact, gain a greater sense of control by abdicating decision-making to trusted caregivers (16). Such a line of hypothesis leads inevitably toward the relationships between internal and external control. This is relatively uncharted territory, but has been examined in some illuminating small, qualitative studies. In a study of women's experiences of complicated childbirth, for example, Berg and Dahlberg described how an involuntary loss of control could lead to a sense of guilt (17). However, one woman said that she felt able to control the decision to leave control to other people, and trusted the physician to do his job. This sentiment fits with the core construct in a study by Bluff and Holloway (18) that the professionals "knew best." Women's sense of control seemed to arise from feeling that they were informed and could challenge decisions if the need were to arise (even though, in practice they did not). In a study by Walker et al, the core construct was the balance between personal control and support (19). Control came from being able to have support (i.e., the midwife's presence) when it was wanted and not have it when it was not wanted, and from being able to hand over control or let the midwife take control when appropriate. Thus, women made comments like "it was great, she took control" because the midwife taking control at the appropriate moment was perceived as highly supportive.

Because the sense of "being in control" is essentially subjective, it is important to try and understand just what a woman means by this, rather than making assumptions that may be inappropriate. Furthermore, caregivers need to understand what leads a woman to feel "in control" or "not in control," in these different senses, both in terms of the events of labor and their antecedents.

Implicit in conceptualizations of external control is that caregivers will be of central importance, since their behavior will confer (or not confer) control. What, though, of caregivers' contribution to internal control? Mander argues that the two major threats to a woman's internal control of which caregivers need to be aware, are pain and the side effects of pain relief (20). Halldorsdottir and Karlsdottir explicitly add to this that the behavior of caregivers can enhance or hinder the sense of self-control directly (21).

Our paper seeks to advance an understanding of "control" through data collected in a replication of the Great Expectations study (papers in preparation). The current paper will revisit the interrelationships among different concepts of control that were examined in the original study; consider how these relate to psychological outcomes; and present analyses that explore the intrapartum and antenatal correlates of feeling in control.

Methods

Sample

The sample was drawn from women expecting babies in April and May 2000, and booked for maternity

care with 1 of 8 maternity units, 4 in the north of England and 4 in the south. All units were in small towns serving semirural areas. Six of the units were medium sized (approximately 2,500 births annually); 1 unit was larger (3,300) and 1 unit was smaller (1,600). Women were included irrespective of whether their booking was for birth in hospital or at home, although the latter were very low. All women booked for delivery during the specified period were eligible; there were no exclusions.

Data Collection

Invitations to take part in the study were forwarded to women by the hospitals to reach them when they were approximately 29 weeks pregnant. This invitation included the first questionnaire (ANQ1). Hospitals each dispatched 300 questionnaires to a consecutive series of women with expected dates of delivery from April 1, 2000, onwards. The second antenatal questionnaire (ANQ2) was sent directly by the research team to arrive by 35 weeks of pregnancy. to women who returned ANQ1. The third questionnaires (PNQ) were sent to women to arrive 6 weeks after the expected date of delivery. Postnatal questionnaires were sent to all women who had not explicitly withdrawn from the study, whether or not the research team had received a valid second questionnaire.

Questionnaire Contents

The questionnaires were based on those used in the Great Expectations study by Green et al (5,6). ANQ1 included demographic items and some questions about the organization of antenatal care. ANQ2 was much longer and covered a range of preferences and expectations for the forthcoming birth. PNQ revisited the topics covered in ANQ2 to discover what the woman's experiences had been and also included measures to assess psychological outcomes (see "Measures").

Questionnaire Response

ANQ1: 2,400 were mailed, of which 1,439 (59.96%) were returned, 7 of which were blank. An additional 29 had no name and address, precluding further correspondence. Three women were so close to their expected date of delivery that it was not possible to send them the second questionnaire in time.

ANQ2: 1,400 were sent. Reminders were mailed to those who did not return the questionnaire within 2½ weeks ($n = 371$, 26.5%). In total, 1,272 questionnaires were returned (90.86% of those sent).

PNQ: 1,395 were sent; 391 women (28.03%) received one reminder, and 133 received two reminders. A total of 1,286 were returned (92.19% of those sent), 1,279 of which contained valid data.

Measures

Demographic Variables

Parity, age, and education were all investigated. Women were defined as multiparous if they had given birth before and primiparous otherwise. Education was coded in 4 categories: degree level or above; "A" levels or equivalent (the exams taken by those who stay in fulltime education until age 18); GCSEs or equivalent (the exams taken by those who stay in fulltime education until age 16); no educational qualifications. Age was used as a continuous variable to the nearest whole year.

Measures of Control

Three senses of "control" will be reported in this paper. The first two measures, control of what staff are doing and control of own behavior, clearly relate to external and internal control, respectively. A third measure was also included that was used in the Great Expectations study: control during contractions. This was taken to be a different sense of internal control (i.e., control of one's body), and so perhaps physiological rather than social.

The following questions were asked to assess the control outcomes:

- *In general, did you feel in control of what the staff were doing to you during labor?*

Response options: yes, always; yes, most of the time; only some of the time; no, hardly at all. For analysis, these were grouped together as "yes always" versus "not always" to reduce the number of small groups, and the grouping was determined on the basis of the relationships observed in univariate analysis. This rationale was also used for grouping categories for other variables.

- *Did you ever feel that you lost control of the way you behaved during labor?*

Response options: yes, for most of the time; yes, for some of the time; no, not at all. For analysis, these were grouped together as "in control all the time" (i.e., did not lose control at all) versus "not in control all the time."

- *Did you feel in control during contractions?*

Response options: yes, for all or most of the time; yes, for some of the time; no, not at all. For analysis, these were grouped together as "yes, all or most of the time" versus "not most of the time."

Each of these questions had a pair of related antenatal questions asking how important it was to feel in control in that way, and expectations of feeling in control. Expectation options were: sure I will be, probably will, no expectations, probably will not be, and sure I will not be. For analysis, to overcome problems of small cell sizes, these were grouped as, expect to be in control; no expectations; and expect not to be in control.

Antenatal questions included a number about pain and preferences for pain relief including:

• *Are you worried about the thought of pain in labor?*

Response options: not at all; a bit worried; very worried.

Events During Labor

The PNQ recorded length of labor, obstetric procedures experienced, and methods of pain relief used. Several questions were asked about subjective experiences, including 3 questions used in the recent United Kingdom Audit Commission survey (22).

• *Were you (and your companion) left alone by the staff at a stage when it worried you to be alone?*

Response options: yes, during labor; yes, after the birth in the delivery room; no, neither. For these analyses the focus was only on being left alone or not in labor.

• *Do you feel that you were treated as an individual?*

• *Do you feel that you were treated with respect?*

Response options in both cases: yes, always; yes, by most of the staff; only by a few of the staff; no, not at all. The last two categories were combined to avoid small cell sizes. For analysis these variables were summed to give a composite score from 4 (i.e., "yes always" to both questions) to 0 ("only by a few" or "no, not at all" to both questions). The composite variable will be referred to as "respect."

Women were also asked to rate how painful they found labor overall, from 0 (no pain at all) to 10 (excruciatingly painful). For analysis responses were grouped as low (0–5), medium (6–8), and high (9–11).

Other questions on subjective experiences were taken from the Great Expectations study and included the following:

• *How did you feel that most of the nonemergency decisions about your labor were made?*

Response options: the staff just got on with it; the staff made the decisions but kept me informed; the staff discussed things with me before reaching a decision; the staff gave me their assessment but I was in control of the decision.

• *Were you able to get into the positions that were most comfortable for you during labor and delivery?*

Response options: no, hardly ever; yes, some of the time; yes, all of the time.

From an adjective checklist, women were asked to "circle whichever of the words describe any of the staff who you saw during labour." Because certain words tended to group together, a principal component factor analysis with Varimax Rotation was carried out, and the regression factors yielded by the factor analysis were used as predictors in the subsequent logistic regression in preference to the individual adjectives. Three factors were generated, which accounted for 41.2 percent of the variance. The adjectives loading on factor 1 (19.4% of the variance) were unhelpful, rude, offhand, bossy, insensitive, inconsiderate, and condescending. The adjectives loading most heavily on factor 2 (11.1%) were rushed (negative relationship), supportive, informative, humorous, and warm; for factor 3 (10.8%) they were considerate, sensitive, and polite. For "shorthand" we will refer to factor 1 as "negative" words, factor 2 as "supportive," and factor 3 as "considerate."

Psychological Outcomes

Satisfaction. At the end of the postnatal questionnaire women were asked "To sum up we would like you to tell us how satisfactory an experience the birth was by giving it a mark out of 10. Ten-out-of-ten would mean an absolutely wonderful experience that could not have been better, nought-out-of-ten would mean a thoroughly unsatisfactory experience with nothing good to be said for it."

Emotional well-being. This was assessed by means of the Edinburgh Postnatal Depression Scale (EPDS) (23). Although designed as a screening tool for health visitors to use as an aid to identifying women likely to be experiencing postnatal depression, EPDS is a valid research tool when used as a continuous measure (24). It consists of 10 depressive symptoms, each of which is scored from 0 (not experienced) to 3 (highest frequency). High scores therefore indicate low emotional well-being and vice versa. A printing error in the PNQ rendered the item on sleep disturbance invalid. Scores for that item have been interpolated from distributions in two other large data sets (total >4,000 women).

Analysis

All data were entered into an SPSS database (25). Univariate analysis was by χ^2 for categorical variables and one-way analysis of variance for continuous

data. Logistic regression was then used to determine which independent variables were contributing most to the prediction of the control outcome measures. General linear models were used to investigate the relative contributions of all three control outcomes to satisfaction and emotional well-being. For reasons of space, details of univariate analyses are not reported, but are available from the authors on request.

Results

Sample Characteristics

Of the 1,279 women returning a valid postnatal questionnaire, 116 had a planned cesarean section and were therefore excluded from this study since they did not experience labor. Of the remainder, 1,146 women answered at least 1 question about experiences of control, and they constitute the study sample. Sixty-eight of these women (5.9%) did not complete the second antenatal questionnaire, and some antenatal data are therefore missing in later analyses. Table 1 gives demographic information. The sample is broadly representative of the population from which it was drawn, although with some expected bias toward the well educated and those whose partners were employed (26,27).

Relationships Among the 3 Measures of Control

Table 2 shows the number of women who reported feeling in control in each of the 3 ways. Women were less likely to report being in control of staff (39.5%) than in control of their own behavior (61.0%). Each measure of control was significantly related to the other two. As the magnitude of the following χ^2 statistics indicate, the highest concordance was between control during contractions and control of behavior (behavior and contractions $\chi^2 = 114.32$, 1 *df*, $p < 0.001$; behavior and staff $\chi^2 = 31.92$, 1 *df*, $p < 0.001$; contractions and staff $\chi^2 = 49.15$, 1 *df*, $p < 0.001$).

As Table 3 shows, approximately one-fifth of the sample felt in control in all 3 ways, and another one-fifth did not feel in control in any of them. A further one-fifth felt in control of their behavior and during contractions, but not of the staff. Of the women who felt in control of the staff, over one-half (53.3%) felt in control of behavior and during contractions, whereas only 31.6 percent women who did not feel in control of staff felt in control of behavior and during contractions.

Demographic Variables Associated with the 3 Measures of Control

Parity was the only demographic variable to be strongly associated with the 3 measures of control, with multiparas feeling more in control than primiparas in all cases (Table 4). Subsequent analyses were therefore carried out separately for multiparous and primiparous women.

Table 1. Sample Characteristics (*n* = 1146)

Variable	*No.*	*(%)*
Parity: primiparous	494	(43.1)
Married/living as married	1070	(93.4)
Ethnicity: white	1102	(96.4)
Education		
Degree/higher degree	280	(24.4)
"A" levels or equivalent	392	(34.2)
GCSE or equivalent	380	(33.2)
No qualifications	94	(8.2)
Partner employed	1034	(95.3)
Booked for home birth	41	(3.6)
Age (mean, sd)	29.86	(5.05)

"A" levels = examinations typically taken at age 18 years.
GCSE = General Certificate of Secondary Education; examinations typically taken at age 16 years.

Table 2. Numbers of Women Reporting Feeling in Control of Staff, Behavior, and During Contractions

Variable	*No.*	*(%)*
Felt in control of what staff were doing		
Always	448	(39.5)
Not always	686	(60.5)
Total	1134	(100.0)
Felt in control of behavior		
All the time	692	(61.1)
Not all the time	440	(38.9)
Total	1132	(100.0)
Felt in control during contractions		
All or most of the time	603	(53.4)
Not most of the time	526	(46.6)
Total	1129	(100.0)

Table 3. Numbers (%) of Women Feeling in Control (✓) or Not in Control (×) in Each of 8 Combinations

Staff	*Behavior*	*Contractions*	*No.*	*(%)*
✓	✓	✓	234	(21.0)
✓	✓	×	78	(7.0)
✓	×	✓	57	(5.1)
✓	×	×	70	(6.3)
×	✓	✓	213	(19.2)
×	✓	×	151	(13.6)
×	×	✓	90	(8.1)
×	×	×	219	(19.7)
Total			1112	(100.0)

Analysis

Univariate Analyses

Univariate analyses were conducted to investigate relationships among each of the control measures and the following variables: *Antenatal variables*: expect control of staff; expect control of behavior; expect control during contractions; worry about labor pain. *Obstetric variables*: mode of delivery; induction; acceleration; length of labor. *Pain relief used*: epidural analgesia; pethidine (or diamorphine); Entonox. Reported level of pain in 3 categories. *Interpersonal variables*: had met midwife before; one midwife throughout labor; left alone in labor; felt treated with respect; staff factor 1 (negative); staff factor 2 (supportive); staff factor 3 (considerate); involvement in nonemergency decision-making; place of birth (home vs hospital). Being able to get comfortable.

Frequencies for each variable, subdivided by parity, are given in Table 5. Length of labor was not a significant factor in any of the analyses. We postulated that this was because the relationship was nonlinear, and repeated the analyses with length of labor in quartiles. Although this confirmed our expectation that both very short and very long labors were associated with less likelihood of feeling in control than labors of intermediate length (3–13 hr), the relationships were still weak and generally not statistically significant.

Logistic Regression

Logistic regression analyses were carried out separately for multiparas and primiparas, with each of the 3 control variables in turn as the dependent variable. Variables were entered into the model only if a significant univariate relationship was found for that outcome for women of that parity.

Results of the 6 analyses are summarized in Tables 6–8. The dependent variable was coded as 1 = "in control" and 0 = "not in control." An odds ratio of greater than 1 means that the event increases a woman's likelihood of feeling in control; a value of less than 1 means that the event is associated with a greater likelihood of not feeling in control. Significant results are in bold.

Exclusions from the Regression Models

Regression models cannot include women who have data missing for any of the included variables. To check generalizability, excluded women were compared with included women on a range of variables including each of the control measures. Two hundred and sixteen women (18.8%) had data missing for at least one variable, although the percentage missing for any one analysis is less than this because only variables with a significant univariate relationship were included. These women did not differ from included women on any of the control measures or psychological outcomes, or by age, recruitment site, or place of birth. They did, however, differ in terms of education (fewer qualifications); mode of delivery (more likely to have had a cesarean section); and number of babies (more likely to have had a multiple birth).

Feeling in Control of Staff

As Table 5 shows, feeling in control of staff related mainly to interpersonal variables, especially being treated with respect, and to being able to get into the most comfortable positions, and this was true for both multiparas and primiparas. Of the three staff factors, only one, factor 3, (considerate), was significant for both multiparas and primiparas; factor 2 (supportive) was also significant for multiparas. Note that factor 1, which represented the negative words (unhelpful, rude, offhand, bossy, insensitive, inconsiderate, condescending), does not make a significant contribution. For primiparas, but not for multiparas, being left alone in labor was also an important variable, being associated with a fivefold decrease in the odds of feeling in control. However, both pain and antenatal worry about pain were significant for multiparas, but not for primiparas. For multiparas, having met the midwife before was also associated with a greater sense of control, as was a greater level of participation in nonemergency decision-making. Note also that level of education was negatively related to feeling in control of staff for primiparas, although not for multiparas; that is, women with fewer educational qualifications felt more in control than those with a college degree. This did not reach

Table 4. Proportion of Primiparas and Multiparas Who Reported Feeling in Control of Staff, Behavior, and During Contractions

Variable	*Primiparas*	*Multiparas*	χ^2	p
In control of staff	136/492 (27.6%)	312/642 (48.6%)	51.183 (1)	< 0.0001
In control of behavior	275/486 (56.6%)	417/646 (64.6%)	7.408 (1)	0.006
In control during contractions	208/485 (42.9%)	395/644 (61.3%)	37.840 (1)	< 0.0001

Table 5. Response Frequency (%) for All Independent Variables for Whole Sample and Subdivided by Parity

	All Women		*Primiparas*		*Multiparas*	
Variable	*No.*	*(%)*	*No.*	*(%)*	*No.*	*(%)*
Expect control of staff						
Expect to be in control	711	(66.2)	283	(61.1)	428	(70.1)
No expectations	265	(24.7)	136	(29.4)	129	(21.1)
Expect not to be in control	98	(9.1)	44	(9.5)	54	(8.8)
Expect control of behavior						
Expect to be in control	397	(37.0)	89	(19.3)	308	(50.3)
No expectations	364	(33.9)	189	(41.0)	175	(28.6)
Expect to lose control	312	(29.1)	183	(39.7)	129	(21.1)
Expect control during contractions						
Expect to be in control	576	(53.8)	191	(41.5)	385	(63.1)
No expectations	311	(29.1)	179	(38.9)	132	(21.6)
Expect not to be in control	183	(17.1)	90	(19.6)	93	(15.3)
Antenatal worry re labor pain						
Not at all	166	(15.4)	42	(9.1)	124	(20.2)
A bit worried	689	(64.0)	297	(64.2)	392	(64.0)
Very worried	221	(20.5)	124	(26.8)	97	(15.8)
Assisted delivery						
Instrumental/unplanned cesarean*	288	(25.2)	216	(43.8)	72	(11.0)
Unassisted	857	(74.9)	277	(56.2)	580	(89.0)
Labor accelerated						
Yes	315	(27.9)	208	(43.0)	107	(16.6)
No	815	(72.1)	276	(57.0)	539	(83.4)
Labor induced						
Yes	313	(27.5)	167	(34.2)	146	(22.5)
No	825	(72.5)	322	(65.9)	503	(77.5)
Reported pain						
Low	169	(15.2)	71	(15.0)	98	(15.5)
Medium	589	(53.1)	251	(52.8)	338	(53.3)
High	351	(31.7)	153	(32.2)	198	(31.2)
Epidural analgesia						
Yes	431	(38.2)	287	(58.8)	144	(22.5)
No	698	(61.8)	201	(41.2)	497	(77.5)
Pethidine (or equivalent)						
Yes	426	(38.1)	225	(47.3)	201	(31.3)
No	692	(61.9)	251	(52.7)	441	(68.7)
Entonox†						
Yes	890	(79.3)	390	(81.4)	500	(77.8)
No	232	(20.7)	89	(18.6)	143	(22.2)
Met midwife before labor						
Yes	214	(18.8)	73	(14.8)	141	(21.7)
No	927	(81.2)	419	(85.2)	508	(78.3)
One midwife throughout labor						
Yes	730	(64.0)	243	(49.2)	487	(75.4)
No	410	(36.0)	251	(50.8)	159	(24.6)
Treated with respect/as an individual						
Neither	44	(3.9)	30	(6.1)	14	(2.2)
Intermediate (aggregate)	349	(30.8)	179	(36.5)	170	(26.4)
Both by all	742	(65.4)	282	(57.4)	460	(71.4)
Left alone in labor						
Yes	161	(14.3)	78	(15.9)	83	(13.0)
No	969	(85.8)	413	(84.1)	556	(87.0)
Nonemergency decision-making						
Staff just got on with it	117	(10.8)	57	(12.0)	60	(9.9)
Staff kept me informed	297	(27.5)	154	(32.3)	143	(23.7)
Staff discussed with me	429	(39.7)	172	(36.1)	257	(42.6)
I was in control	238	(22.0)	94	(19.7)	144	(23.8)
Birth at home or in hospital						
Hospital	1114	(97.2)	493	(99.8)	621	(95.3)
Home	32	(2.8)	1	(0.2)	31	(4.8)

Table 5. Continued

Variable	All Women No.	All Women (%)	Primiparas No.	Primiparas (%)	Multiparas No.	Multiparas (%)
Able to get into most comfortable position						
No, hardly ever	243	(21.7)	141	(29.4)	102	(16.0)
Yes, some of the time	575	(51.4)	258	(53.8)	317	(49.6)
Yes, all of the time	301	(26.9)	81	(16.9)	220	(34.4)
Length of labor (hr)						
<4	222	(21.1)	28	(6.2)	194	(32.4)
4–<7	259	(24.7)	61	(13.5)	198	(33.1)
7–<13	302	(28.8)	163	(36.1)	139	(23.2)
13 or more	267	(25.4)	200	(44.3)	67	(11.2)

*Planned cesareans were already excluded from the analysis.
†Entonox: inhalational self-administered analgesic, 50:50 oxygen and nitrous oxide.

significance for those with no qualifications because of the relatively small numbers.

Feeling in Control of Behavior

For feeling in control of behavior, "interpersonal" variables contributed very little to the model for either multiparas or primiparas. Pain and methods of pain relief were the primary factors for both. Low levels of pain were associated with a sixfold increase in the odds of feeling in control compared with the highest levels of pain. Entonox use was associated with a greater than twofold decrease compared with nonuse, and pethidine use was also significant for primiparas. Antenatal worry about pain was also a major variable for these women. Being only "a bit worried" was associated with a greater than fourfold increase in the odds compared with those who had been "very worried." Expectations of being in control of behavior were also significant, especially for multiparas: expecting to be in control was associated with a 3.6-fold increase in odds compared with expecting to lose control. Acceleration of labor was also found to be significant for multiparas, being associated with a nearly twofold increase in the odds of feeling in control. This unexpected finding was in keeping with the univariate analysis.

Feeling in Control During Contractions

For primiparas, feeling in control during contractions was predicted primarily by pain-related variables: both the experience of pain and antenatal worry. As with control of behavior, antenatal worry about pain was not significant for multiparas, although the experience of pain was. Expectations of control were also important only for these women. Staff factor 2 (supportive) also contributed to multiparas feeling in control during contractions, as did being able to get into the most comfortable positions.

Psychological Outcomes

Relationships between Control and Satisfaction

Satisfaction was positively related to experiencing each of the 3 measures of control for both multiparas and primiparas ($p < 0.001$ in all cases). The distribution of satisfaction scores was, predictably, not normal, and the primary analyses were rerun, using both Mann-Whitney U tests and also χ^2, with satisfaction recoded as a categorical variable (high, medium, and low) (not shown). These analyses confirmed the findings of the parametric tests.

The 3 control measures were entered into a general linear model with satisfaction as the dependent variable. This analysis was done separately for multiparas and primiparas. For multiparas, this confirmed the significance of all 3 control measures to satisfaction: feeling in control of staff ($F = 41.96$, 1 *df*, $p < 0.001$); control of behavior ($F = 9.29$, 1 *df*, $p < 0.01$); and control during contractions ($F = 10.62$, 1 *df*, $p < 0.001$). For primiparas, control of staff ($F = 25.77$, 1 *df*, $p < 0.001$) and control during contractions ($F = 13.8$, 1 *df*, $p < 0.001$) were significant primary effects, but a significant interaction ($p < 0.05$) also was found between control of staff and control of behavior. Examination of the marginal means suggested that, although feeling in control of behavior was not important to satisfaction if the woman felt in control of staff, it became important if she did not.

The 3 control measures were again entered into a general linear model with satisfaction as the dependent variable, this time including the corresponding expectation as a second fixed effect. This analysis was done separately for multiparas and primiparas. For

control of staff, experience was the only significant primary effect for multiparas (F = 21.58, 1 *df*, $p < 0.001$). This was also true for control of contractions for both groups (F = 8.03, 1 *df*, $p < 0.01$ and F = 4.84, 1 *df*, $p < 0.05$). For primiparas, however, experiencing control of staff was not significant but expectations were (F = 3.23, 2 *df*, $p < 0.05$). For control of behavior, neither experiences nor expectations were significant for either group.

Relationships between Control and Emotional Well-being

Feeling in control of what staff were doing was associated with lower EPDS scores (i.e., fewer depressive symptoms) for both multiparas (F = 8.81, 1 *df*, $p < 0.01$) and primiparas (F = 13.34, 1 *df*, $p < 0.001$). The EPDS score also related to control of behavior for primiparas (F = 14.19, 1 *df*,

Table 6. Summary of Results of Logistic Regression Analyses with Control of Staff as Dependent Variable, for Primiparas and Multiparas (significant results in bold)

	Primiparas (n = *415*)			*Multiparas* (n = *533*)		
		95% CI for OR			*95% CI for OR*	
Variable	*OR*	*Lower*	*Upper*	*OR*	*Lower*	*Upper*
Antenatal variables						
Education				Not entered		
Degree (ref)	1.00					
"A" levels	**2.38**	**1.15**	**4.93**			
GCSE level	**2.63**	**1.21**	**5.73**			
No qualifications	2.57	0.79	8.39			
Expect to be in control during contractions	Not entered					
Expect not to be (ref)				1.00		
Expect to be				1.67	0.87	3.22
No expectations				0.89	0.43	1.84
Antenatal worry re pain						
Very worried (ref)	1.00					
A bit worried	0.87	0.30	2.52	**2.92**	**1.35**	**6.29**
Not at all worried	1.02	0.54	1.94	**2.69**	**1.39**	**5.21**
Obstetric procedures						
Acceleration	0.77	0.40	1.46	Not entered		
Induction	0.59	0.32	1.11	Not entered		
Assisted delivery	0.66	0.36	1.19	0.73	0.31	1.74
Pain variables						
Reported pain						
High (ref)	1.00			1.00		
Low	0.79	0.34	1.83	**2.63**	**1.26**	**5.47**
Medium	0.57	0.30	1.06	1.14	0.71	1.84
Used epidural analgesia	0.91	0.48	1.73	0.72	0.39	1.33
Interpersonal variables						
Had met midwife before	Not entered			**1.75**	**1.02**	**3.01**
One midwife throughout	1.25	0.72	2.17	1.11	0.67	1.84
Left alone in labor	**0.18**	**0.06**	**0.56**	0.69	0.34	1.40
Respect	**2.18**	**1.48**	**3.21**	**2.18**	**1.54**	**3.07**
Staff factor 1 (negative)	0.92	0.64	1.33	1.29	0.79	2.10
Staff factor 2 (supportive)	Not entered			**0.73**	**0.55**	**0.96**
Staff factor 3 (considerate)	**0.64**	**0.47**	**0.89**	**0.76**	**0.59**	**0.96**
Nonemergency decision-making						
Staff got on with it (ref)	1.00			1.00		
Staff kept me informed	1.22	0.42	3.59	0.79	0.34	1.84
Staff discussed with me	1.62	0.55	4.76	1.35	0.61	3.00
I was in control	1.62	0.53	4.99	**2.47**	**1.05**	**5.81**
Gave birth at home	Not entered			0.37	0.09	1.50
Able to get comfortable						
No, hardly ever (ref)	1.00			1.00		
Some of the time	**2.09**	**1.01**	**4.33**	1.44	0.73	2.82
All of the time	**4.65**	**1.93**	**11.21**	**4.11**	**1.96**	**8.61**

"A" levels = examinations typically taken at age 18 years.
GCSE = General Certificate of Secondary Education; examinations typically taken at age 16 years.

$p < 0.001$) and control during contractions for multiparas ($F = 6.69$, 1 *df*, $p < 0.01$).

The 3 control measures were entered into a general linear model with EPDS score as the dependent variable. This analysis was done separately for multiparas and primiparas. For primiparas, control of staff and control of behavior were both significant primary effects ($F = 7.91$, 1 *df*, $p < 0.01$ and $F = 4.02$, 1 *df*, $p < 0.05$), but control during contractions was not. For multiparas, although the combined effects were significant, none of the individual primary effects was.

The 3 control measures were again entered into a general linear model with EPDS score as the dependent variable, this time including the corresponding expectation as a second fixed effect. This analysis was done separately for multiparas and primiparas. For control of staff, experience was the only significant primary effect for primiparas ($F = 6.42$, 1 *df*, $p < 0.05$). Neither expectations nor experiences were significant for multiparas. For control of behavior, expectations but not experiences were significant for both groups ($F = 4.57$, 2 *df*, $p < 0.01$and $F = 4.25$, 2 *df*, $p < 0.05$). For control of contractions, expectations were significant for primiparas $F = 4.43$, 2 *df*, $p < 0.05$); neither expectations nor experiences were significant for multiparas.

Discussion and Conclusions

These analyses have confirmed that the 3 different types of control were all important to women, and all contributed to psychological outcomes. Although overlaps among them occurred, they were clearly distinguished and a minority of the sample gave the same response to all 3 measures. Feeling in control during contractions was confirmed as tapping a slightly different aspect of internal control from control of behavior. Internal and external control were predicted by different groups of

Table 7. Summary of Results of Logistic Regression Analyses with Control of Behavior as Dependent Variable, for Primiparas and Multiparas (significant results in bold)

	Primiparas (n = *425*)			*Multiparas* (n = *564*)		
		95% CI for OR			*95% CI for OR*	
Variable	*OR*	*Lower*	*Upper*	*OR*	*Lower*	*Upper*
Antenatal variables						
Expect to be in control of behavior						
Expect not to be (ref)	1.00			1.00		
Expect to be	1.53	0.84	2.77	**3.62**	**2.16**	**6.08**
No expectations	**1.75**	**1.09**	**2.81**	**1.91**	**1.11**	**3.30**
Expect to be in control during contractions	Not entered					
Expect not to be (ref)				1.00		
Expect to be				1.52	0.87	2.65
No expectations				1.15	0.61	2.18
Antenatal worry re pain				Not entered		
Very worried (ref)	1.00					
A bit worried	**4.11**	**1.62**	**10.41**			
Not at all worried	1.23	0.75	2.01			
Obstetric procedures						
Acceleration	Not entered			**1.92**	**1.09**	**3.37**
Pain variables						
Reported pain						
High (ref)	1.00			1.00		
Low	**6.31**	**2.80**	**14.20**	**5.36**	**2.49**	**11.52**
Medium	**2.43**	**1.52**	**3.89**	**1.69**	**1.12**	**2.55**
Used pethidine	**0.63**	**0.40**	**0.97**	Not entered		
Used Entonox	**0.45**	**0.25**	**0.82**	**0.43**	**0.25**	**0.74**
Interpersonal variables						
Left alone in labor	0.83	0.45	1.52	0.71	0.40	1.27
Respect	**1.25**	**1.03**	**1.51**	1.15	0.93	1.42
Staff factor 2 (supportive)	Not entered			0.83	0.67	1.04
Able to get comfortable						
No, hardly ever (ref)	1.00			1.00		
Some of the time	1.41	0.85	2.32	0.99	0.57	1.73
All of the time	1.04	0.53	2.04	1.52	0.83	2.81

variables in the logistic regressions. In particular, pain and pain relief were important to internal control, and interpersonal variables to external control. This supports Mander's view of pain and the side effects of pain relief as the primary threats to internal control (20). Halldorsdottir and Karlsdottir's (21) argument that the behavior of caregivers can enhance or hinder the sense of self-control directly is not, however, supported. Whereas staff variables were related to internal control in the univariate analyses, they were generally not significant in the logistic regression, suggesting that the influence of staff on internal control is mediated through other variables, probably through control of pain.

Obstetric procedures were found to be relatively unimportant, and in univariate analyses most were negatively related to feeling in control of staff but were typically not related to other types of control. However, even these relationships were not strong and did not make a significant contribution in the logistic regression analyses. The only exception was the finding that multiparas whose labor was accelerated felt more in control of behavior, which may therefore just be a type I error. Evidently obstetric procedures need not necessarily decrease a woman's feeling of control. Few significant relationships occurred between the experience of obstetric procedures and feeling treated as an individual or with respect, which underlines this point.

Table 8. Summary of Results of Logistic Regression Analyses with Control During Contractions as Dependent Variable, for Primiparas and Multiparas (significant results in bold)

	Primiparas (n = *414*)			*Multiparas* (n = *530*)		
		95% CI for OR			*95% CI for OR*	
Variable	*OR*	*Lower*	*Upper*	*OR*	*Lower*	*Upper*
Antenatal variables						
Expect to be in control of behavior	Not entered					
Expect not to be (ref)				1.00		
Expect to be				1.10	0.64	1.88
No expectations				1.06	0.60	1.89
Expect to be in control during contractions						
Expect not to be (ref)	1.00			1.00		
Expect to be	1.24	0.68	2.23	**2.31**	**1.28**	**4.16**
No expectations	0.65	0.36	1.19	1.03	0.53	1.98
Antenatal worry re pain				Not entered		
Very worried (ref)	1.00					
A bit worried	**3.09**	**1.30**	**7.34**			
Not at all worried	1.62	0.95	2.76			
Obstetric procedures						
Assisted delivery	0.82	0.51	1.32	Not entered		
Pain variables						
Reported pain						
High (ref)	1.00			1.00		
Low	**7.09**	**3.34**	**15.06**	**4.13**	**2.09**	**8.14**
Medium	**2.24**	**1.35**	**3.70**	**2.74**	**1.79**	**4.20**
Used epidural analgesia	0.74	0.45	1.21	0.84	0.49	1.43
Used pethidine	**0.63**	**0.40**	**0.99**	0.74	0.48	1.14
Used Entonox	Not entered			0.74	0.44	1.25
Interpersonal variables						
Left alone in labor	Not entered			1.10	0.60	2.00
Respect	1.15	0.95	1.39	1.27	0.98	1.65
Staff factor 1 (negative)	Not entered			1.06	0.76	1.47
Staff factor 2 (supportive)	Not entered			**0.78**	**0.62**	**0.99**
Nonemergency decision-making						
Staff got on with it (ref)	1.00			1.00		
Staff kept me informed	0.50	0.23	1.07	1.06	0.50	2.22
Staff discussed with me	0.70	0.33	1.49	1.38	0.68	2.79
I was in control	0.73	0.32	1.69	1.28	0.60	2.76
Able to get comfortable						
No, hardly ever (ref)	1.00			1.00		
Some of the time	1.57	0.91	2.71	1.32	0.74	2.37
All of the time	1.61	0.78	3.33	**2.38**	**1.24**	**4.55**

We were surprised to find that length of labor was not a significant factor in any analyses, either univariate or multivariate. Similarly, birth at home versus in hospital made little contribution even at the univariate level. However, only 32 homebirths (2.8% of the total) occurred in the sample. The other variable that proved less significant than expected from previous literature was having one midwife who cared for the woman throughout her labor. This was strongly related to feeling in control of staff in the univariate analyses, but was not significant in any of the logistic regressions—presumably because the effect is mediated through other variables.

Major differences were found in the experiences of multiparas and primiparas, with the latter reporting considerably less control, especially of staff and during contractions. This was the reason for conducting analyses separately for multiparas and primiparas, and it proved to be beneficial for two reasons. First, several "findings" that were significant for the sample as a whole, proved to be only artefacts associated with parity (age, for example), and could therefore be disregarded. Second, separate analyses allow more confidence in findings that are independently confirmed. Nonetheless, we should not necessarily dismiss findings that apply only to one group or the other because it is likely that some differences will occur between multiparas and primiparas in terms of contributors to a sense of control, as was shown, for example, with antenatal expectations.

One must be cautious in drawing conclusions about causality when interpreting these data. For example, although women who experience a great deal of pain may feel less in control, it is equally plausible that not feeling in control leads to the experience of greater pain. This is where it is particularly valuable to have collected data from women during pregnancy, because we can feel more confident in postulating a direction to relationships. Notably, we found that, for multiparas, expectations of control of behavior and during contractions were major predictors of these experiences. That this finding should only occur for multiparas seems perfectly reasonable, since they can base their expectations on previous experience. The finding suggests an interesting avenue for future research in discovering why multiparas with low expectations feel the way that they do, and whether an intervention to raise their expectations would result in better experiences. For primiparas, feeling in control of behavior and during contractions was predicted not by expectations of control but by worry about labor pain. Other analyses, not presented here, confirmed that worry about labor pain was associated with poor outcomes for both multiparas and primiparas. There was no association between attendance at antenatal classes and worry about labor pain for either group.

The final important variable is "being able to get into the positions that were most comfortable." In the original 1987 study, this question had related to every psychological outcome considered. In the current study significant univariate relationships occurred with all 3 control measures. In the logistic regressions, being able to get comfortable was one of the most significant predictors of feeling in control of staff for both primiparas and multiparas, and it was also significant for the latter's feeling in control during contractions. This is clearly a dimension that merits further research.

The sense of control that had the strongest relationships with other variables and also the most impact on psychological outcomes was feeling in control of what staff were doing. This was, in fact, the sense of control in which fewest women reported themselves in control at all times. To some extent, this finding is an artefact of the response options offered, which were not identical for the 3 questions, but it is still a source of concern that so few women felt always in control of what staff were doing to them. On the other hand, this is the sense of control about which staff are most able to do something. The variables that were most closely related to feeling in control of staff were predominantly those related to the way that women perceived themselves to be treated. Participation in decision-making was especially important to multiparas, but more important were feeling treated with respect and feeling treated as an individual. These findings appear to support Waldenström's (13) conceptualization of external control as being a "subject" not an "object." Almost all individual adjectives to describe staff were significantly related to feeling in control of staff. This is reflected in the logistic regression, although it was interesting to see that factors 2 and 3, which represented positive attributes, were most important. This suggests that the positive words were tapping something more subtle that was not being reflected in other variables. The individual word that stood out for both multiparas and primiparas in the univariate analyses was "considerate." Overall, 72 percent of the sample chose this word; the 28 percent who did not rate their caregivers as considerate felt significantly less in control. In fact, a very strong overlap was shown between feeling treated as an individual and rating staff as considerate. These perceptions were not related to whether or not the woman had previously met any of the midwives caring for her.

Caregivers have the potential to make a significant difference to a woman's experience of childbirth—a

feature that clearly operates at several different levels. The ways in which women are helped to deal with pain will affect internal control; the extent to which they feel that they are actually cared *about*, rather than care being something that is done to them, will affect external control. Both contribute to satisfaction and emotional well-being.

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