

# Does Mothering a Doll Change Teens' Thoughts About Pregnancy?

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**ABSTRACT.** *Objective.* To determine the effect of age on the efficacy of the computerized, infant simulator doll Baby Think It Over (BTIO) for increasing middle school girls' knowledge about the responsibilities of parenthood and discouraging plans for teen childbearing. We hypothesized: 1) 8th grade students would be less apt than 6th grade students to equate BTIO care with mothering because they would rationalize that their infant would be easier to care for than BTIO; and 2) BTIO would be a more effective teen pregnancy prevention program with 6th grade students than with 8th grade students.

*Methods.* Nulliparous 6th ( $n = 68$ ) and 8th ( $n = 41$ ) grade girls attending an urban middle school in a predominantly lower socioeconomic, Hispanic, neighborhood were asked to care for BTIO for 3 days and 2 nights. Responses to a self-administered questionnaire were used to assess the girls' understanding of the responsibilities and difficulties associated with parenting, their feelings about the similarity of BTIO care and real infant care, and their childbearing intentions before and after caring for BTIO.

*Results.* Only 32 (29%) of the 109 girls thought that real infant care would be like BTIO care. Although 8th grade students were less apt than 6th grade students to equate BTIO care with real infant care (17% vs 37%), 6th grade students were more likely than 8th grade students to endorse statements suggesting that real infant care would be easier than BTIO care (37% vs 24%). Multivariate analyses revealed that this was largely because 6th grade students found BTIO care more difficult than did 8th grade students. Also, regardless of age or grade, the more difficult a girl found it to care for BTIO than anticipated, the more likely she was to endorse statements indicating that it would be easier to care for her own infant than it had been for her to care for BTIO. Little learning about the difficulties of parenting took place during the study. On average, the 6th grade students did not find BTIO care more difficult than anticipated and the 8th grade students actually found it easier than anticipated. Finally, caring for BTIO had no effect on the intent of students to become teen parents; 13 (12%) of the 109 students wanted to be teen parents before they cared for BTIO and 16 (15%) wanted to be teen parents after they cared for the doll.

*Conclusion.* The results of this study demonstrate that the propensity of people this age for rationalizing their own immunity to the noxious aspects of potentially desirable situations (the personal fable of omnipotence) allows those who perceive parenthood to be attractive to

overlook the negative aspects of any parenting experience they have. *Pediatrics* 2000;105(3). URL: <http://www.pediatrics.org/cgi/content/full/105/3/e30>; adolescent pregnancy, contraception, adolescence.

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ABBREVIATIONS. BTIO, Baby Think It Over; SD, standard deviation.

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The birth rate among American teenagers has declined steadily since 1991.<sup>1</sup> Nevertheless, the teen pregnancy rate in this country remains one of the highest in the Western, developed world.<sup>2</sup> Preventing early teen pregnancy is a highly sought after public health goal.<sup>3,4</sup> Various efforts to achieve this goal have, on balance, failed over the past 4 decades.<sup>3-8</sup>

During the 1960s and 1970s, sex education was introduced to classrooms with the expectation that more knowledge about human reproduction would deter early conception.<sup>5-8</sup> Despite the positive effect of these programs on student knowledge, sex education has not had a significant effect on teenagers' intended or actual sexual and contraceptive behavior or the teen pregnancy rate in this country.<sup>5-8</sup> This is thought to be in part because people this age have trouble applying the knowledge they acquire in the classroom to real life situations.<sup>5-8</sup> Thus, during the 1980s, sex education was expanded to include decision-making exercises designed to give students the opportunity to apply their new knowledge to simulated life conditions.<sup>6-11</sup> These programs helped prevent the untoward consequences of unprotected sexual activity, particularly when linked to school-based or teen-oriented neighborhood clinics.<sup>9-12</sup> However, they were ineffective with teenagers who had little intrinsic interest in obtaining or using contraceptives.<sup>7-12</sup> Thus, during the 1990s, several programs were developed to address the motivational component of the teen pregnancy problem. Educators who acknowledged that early parenthood offered little in the way of opportunities for their most impoverished students promoted incentive programs that rewarded pregnancy-preventing behaviors. They also introduced classroom exercises to help these students develop realistic, achievable, future-oriented goals that would be more attractive than, and incompatible with, early parenthood.<sup>3,6,9,12</sup> In contrast, other educators sought to deromanticize parenthood by implementing classroom exercises that were supposed to teach students about the onerous responsibilities associated with being a parent. These activities required students to care for infant surrogates,

From University of Colorado, Health Sciences Center, Denver, Colorado. This work was presented in part at the Pediatric Academic Societies' Annual Meeting; May 1-5, 1998; New Orleans, LA. Received for publication May 11, 1999; accepted Oct 18, 1999. Reprint requests to (J.K.) 630 Redwood Ave, Corte Madera, CA 94925. PEDIATRICS (ISSN 0031 4005). Copyright © 2000 by the American Academy of Pediatrics.

such as eggs, sacks of flour, and most recently, the Baby Think It Over (BTIO) doll.<sup>13-16</sup>

BTIO, a 7-lb life-like doll, represents an advance over previous infant surrogates because it contains an internal computer that simulates the loud, hard cry of an infant at random intervals of 15 minutes to 4 hours, 24 hours a day.<sup>15,16</sup> Because BTIO can only be silenced with a probe that is attached to the caretaker's wrist with a tamper-evident bracelet, the doll puts demands on its teenage caretaker and interferes with her daily activities and sleep.

Anecdotal newspaper reports and the results of 1 published study indicate that teenagers find BTIO difficult to care for.<sup>15,16</sup> However, there is no evidence that teenagers equate doll care with real infant care or that their sentiments about the former affect their motivation to avoid the latter. Rather, studies of the pattern of cognitive development during adolescence raise serious concerns about the validity of the premise that they will do so.<sup>17,18</sup> Indeed, the egocentrism and sense of personal invulnerability that permeates cognitive processes at this age (the personal fable of omnipotence), enables teenagers to rationalize their own immunity to the onerous aspects of a potentially desirable situation.

We prospectively compared the reactions of 6th and 8th grade girls to BTIO. We chose this population for study because the middle school years are pivotal in the formation of life-long reproductive behavior.<sup>19</sup> Also, we reasoned that the growing sense of personal invulnerability that is characteristic of this stage of adolescent cognitive development would influence the efficacy of the BTIO approach to preventing teen pregnancy.

Specifically, we hypothesized that: 1) 8th grade students would be less apt than 6th grade students to equate BTIO care with mothering because they would rationalize that their infants would be easier to care for; 2) BTIO would be a more effective teen pregnancy prevention program with 6th grade students than with 8th grade students.

## METHODS

### Study Subjects

All the girls in one 6th and one 8th grade class in an urban middle school located in a lower socioeconomic, predominantly Hispanic, neighborhood in Denver, CO, were invited to obtain written parental permission to participate in the study. This neighborhood was chosen because vital statistic data indicate that it has one of the highest teen pregnancy rates in the Denver metropolitan area.

Sixth grade students were more enthusiastic about the prospect of caring for BTIO than were 8th grade students. Many of the 8th grade students declined to participate for reasons that reflected their concern about the "imaginary audience."<sup>17</sup> That is on the grounds that "they were too old to play with dolls" or that "people would stare at someone my age carrying a doll." As a result, 68 (75%) of the 91 sixth grade students but only 41 (57%) of the 72 eighth grade students obtained parental permission to participate. Because teenagers who express these types of concerns about the imaginary audience are typically at the same stage of cognitive development as those who endorse the personal fable,<sup>17,18</sup> this selective loss of 8th grade students could have resulted in an under estimation of the effects of cognitive maturation in the population we studied.

The study was approved by the Committee on Investigations Involving Human Subjects at the University of Colorado Health Sciences Center.

### Intervention

Participants spent 3 days and 2 nights with BTIO. Each girl had a care key attached to her wrist with a tamper-evident armband and carried a diaper bag along with BTIO.

### Data Collection

The principal assessment instrument was a 3-part, self-administered questionnaire developed for this investigation and written at a 4th grade reading level. The questionnaire was distributed to the students during class time and explained to them. Part 1 (completed before the BTIO experience) collected background information including personal and environmental characteristics that have the potential to influence feelings and knowledge about parenting, such as exposure to relatives and close friends who were or had been teen parents, baby-sitting experience, and educational and career goals. Part 2, entitled "My Feelings About Doll Care," was completed both before and after the BTIO experience. It consisted of a series of 10 statements about caring for BTIO. For example, "it will be (was) hard to wake up at night and feed the doll" and "it will be (was) hard to get ready for school and care for the doll." The respondent was asked to rate each statement on a 4-point Likert scale, ranging from "not true at all for me" (score = 1) to "very true for me" (score = 4). Cronbach- $\alpha$ s were .92 and .89, respectively, for the pre- and post-BTIO testing. Part 3, entitled "My Feelings About Real Baby Care," was completed after the BTIO experience. It consisted of a series of 8 statements about the similarity of doll care to real infant care. The respondent was asked to rate these statements on the same 4-point Likert scale. In an effort to appeal to the participants' egocentrism and feelings of personal omnipotence, each statement was phrased "my baby would be easier than (the same as) the doll because. . . ." The Cronbach- $\alpha$  for Part 3 was .82. Finally, both before and after the BTIO experience, the participants were asked how old they hoped to be when they had their first child. Those who indicated that they planned to be <20 years old when they had their first child defined the subgroup that intended to become teen parents.

### Definition of Efficacy

Although the long-term efficacy of the BTIO program can only be assessed by measuring adherence to safe sexual practices throughout adolescence and the avoidance of teen pregnancy, the more immediate effects of the experience on knowledge and behavioral intention can be assessed as potential first steps toward long-term behavioral change. Although knowledge alone has not been found to be sufficient to change behavior, it is certainly a necessary prerequisite. To assess the efficacy of the BTIO experience for teaching teenagers the depth of the responsibility involved in parenting, we compared the participants' pre- and post-BTIO scores on the "My Feelings About Doll Care" questionnaire. A higher post-BTIO score, indicating that the teenager had found the actual experience of caring for BTIO more difficult than she had anticipated, was taken as evidence of increased knowledge (learning) about the difficulties associated with parenting a child. Because the results of previous studies suggest that an individual's intention to behave a certain way is an important predictor of their actual behavior,<sup>20,21</sup> we assessed the efficacy of the BTIO experience for changing intended childbearing behavior by comparing the age at which the participants stated they hoped to have their first child before and after the caring for BTIO. The intent to become a teen parent before, but not after, caring for BTIO was interpreted as evidence of a positive change in childbearing intentions.

### Data Analysis

Univariate analyses were used to describe the study population and to report on the frequency with which the study subjects endorsed various statements about the ease and difficulty of caring for BTIO and the similarity of the BTIO experience to that of parenting a real infant. Relationships between the various background variables, scale scores, and childbearing intentions were examined using Pearson Correlations. The initial comparisons between 6th and 8th grade students were conducted with bivariate analyses ( $t$  tests and  $\chi^2$ ). Multivariate analyses using forward stepwise regression were conducted to determine whether findings at the bivariate level would be supported after adjusting for relevant background characteristics, expectations about the diffi-

### RESULTS

The students participating in this study ranged in age from 10.3 to 15.3 years (mean  $\pm$  standard deviation [SD]: 12.9  $\pm$  1.2 years). Most (94%) were Hispanic, lived with at least 1 biologic parent (96%) and had some baby-sitting experience (80%). Although most students responded that they wanted to attend college (81%) and to delay parenting until they were in their twenties (mean  $\pm$  SD = 22.7  $\pm$  2.9 years), these girls live in a neighborhood in which the high school graduation rate is only  $\sim$ 60% and the teen pregnancy rate is one of the highest in the state. Other investigators have also noted discrepancies of this type between expectations for the future and the reality of the living environment in populations of teenagers who are at high risk for pregnancy.<sup>8,9</sup> With the exception of the anticipated difference in age, Table 1 shows that the only significant difference between the 6th and 8th grade students was that the latter were more likely to have boyfriends.

Only a minority 32 (29%) of the 109 students thought that real infant care would be like BTIO care. As hypothesized, 8th grade students were less apt to equate BTIO care with real infant care than were 6th grade students (17% compared with 37%;  $P = .02$ ). However this was not because 8th grade students were more likely to expect that caring for their own infant would be easier than caring for BTIO. In fact, 6th grade students were more likely than 8th grade students to endorse statements suggesting that real infant care would be easier than BTIO care (37% compared with 24%;  $P = .02$ ). Correlational analyses revealed that, in addition to grade and age, the feeling that it would be easier to take care of one's own infant than BTIO was directly related to learning about the difficulties of parenthood (the difference

between the anticipated and actual difficulty of BTIO care;  $P = .002$ ). Feelings about the relative ease of real infant care and BTIO care were unrelated to the intent to become a teen parent. A multivariate analysis that controlled for statistically significant grade-group differences in background characteristics (age and boyfriend status), revealed that learning about the difficulties of parenthood was the only significant predictor of the feeling that it would be easier to take care of one's own infant than BTIO ( $P = .002$ ). Thus, regardless of age or grade, the more difficult a girl found it to care for BTIO than anticipated, the more likely she was to endorse statements indicating that it would be easier for her to care for her own infant than it had been for her to care for BTIO.

Table 2 examines the relative efficacy of BTIO for teaching 6th and 8th grade girls that it is difficult to be a parent. The data show that little learning took place during the study period. On average, 6th grade students did not find BTIO care significantly more difficult than anticipated and 8th grade students actually found it easier to care for BTIO than they anticipated it would be. As a result, 8th grade students were less likely to learn about the difficulties of parenting than 6th grade students. Indeed, only 32% of the 8th grade students compared with 51% of the 6th grade students found BTIO care more difficult than they anticipated it would be ( $P = .04$ ). Correlational analyses showed that, in addition to grade and age, learning about the difficulties associated with parenting (eg, the difference between the anticipated and actual difficulty of BTIO care) was inversely related to the anticipated difficulty of doll care ( $P < .0001$ ) and directly related to the actual difficulty of doll care ( $r = .45$ ;  $P < .0001$ ) and the intent to become a teen parent ( $P = .02$ ). In multivariate analyses controlling for statistically significant grade-group differences in background characteristics (eg, age

TABLE 1. Background Characteristics

Variables	Grade Level		
	Sixth (n = 68)	Eighth (n = 41)	All (n = 109)
Age (mean + SD)	12.1 $\pm$ .5	14.2 $\pm$ .7	12.9 $\pm$ 1.2
Race n (%)			
Hispanic	62 (91)	40 (98)	102 (94)
White	4 (6)	1 (2)	5 (4)
Black	2 (3)	0 (0)	2 (2)
Living arrangement n (%)			
At least 1 parent	66 (97)	39 (95)	105 (96)
2 parents	7 (54)	19 (46)	56 (51)
Siblings n (%)			
>3	31 (46)	22 (53)	53 (49)
Older sister	32 (47)	15 (37)	47 (44)
Boyfriend n (%)	13 (19)	23 (56)	36 (33)
Post high school plans n (%)			
College	55 (81)	33 (80)	88 (81)
Work	11 (16)	7 (17)	18 (16)
Relationship with a teen parent n (%)			
Mother	14 (21)	8 (21)	22 (21)
Sister	6 (9)	4 (10)	10 (10)
Friend or relative	31 (48)	20 (51)	51 (50)
Babysitting experience n (%)			
Less than weekly	53 (79)	32 (78)	85 (78)
More than weekly	15 (22)	12 (29)	27 (25)



**TABLE 2.** Feelings About Doll Care

Feelings About Doll Care*	Grade Level			P Value
	Sixth (n = 68)	Eighth (n = 41)	All (n = 109)	
Anticipated difficulty (pre BTIO)	2.3 ± .8	3.0 ± .6	2.55 ± .8	<.0001
Actual difficulty (post BTIO)	2.5 ± .8	2.8 ± .7	2.6 ± .8	.02
Difference in difficulty (post-pre)	.2 ± .9	.2 ± .5	.1 ± .8	.02
BTIO care harder than anticipated n (%)	35 (51)	13 (32)	48 (44)	.04

\* Scores (mean ± SD) based on a 4-point Likert scale. 1 (easy to care for BTIO) to 4 (hard to care for BTIO).

and boyfriend status) and childbearing intentions, the anticipated difficulty of doll care emerged as the only significant, independent, predictor of learning about the difficulties of parenthood (eg, the difference between the anticipated and actual difficulty of BTIO care;  $P < .001$ ). In other words, regardless of age, grade, or initial childbearing intentions, the easier a girl thought it would be to care for BTIO, the more she learned about the difficulties of being a parent.

The data presented in Table 3 show that there were no grade-related differences in intended childbearing behavior either before or after the BTIO experience. Both correlational and regression analyses revealed that intended childbearing behavior before caring for BTIO was the only significant predictor of intended childbearing behavior after caring for BTIO ( $P < .0001$ ). Thus, caring for BTIO had almost no effect on the study participants' intent to become teen parents.

**DISCUSSION**

The primary purpose of this study was to determine the effect of grade level (and by extension, age and cognitive maturity) on the efficacy of a computerized, infant simulator doll (BTIO) for increasing middle school girls' knowledge and understanding of the difficulties involved in parenting a child, thus discouraging them from planning to be teen parents. We hypothesized that, attributable to their allegiance to "the personal fable of omnipotence," 8th grade students would be less apt than 6th grade students to equate BTIO care with mothering. That is, more 8th grade students would rationalize that their infants would be easier to care for than BTIO. Thus, we anticipated that BTIO would be a more effective teen-pregnancy prevention program with 6th grade students than with 8th grade students. Instead, we found that grade level was not a significant independent predictor of perceptions about BTIO or the efficacy of the BTIO program. This may have been in

part because concerns about the "imaginary audience" ("I don't want to participate because people will stare at someone my age carrying a doll") prevented a disproportionately large number of the 8th grade students from signing up for the study. Those 8th grade students are the teens who we expected might be most apt to believe in the personal fable. With this in mind, the results of this study indicate that, regardless of grade, only a minority (29%) of the students thought that BTIO care would be like real infant care. Little learning about the difficulties of parenting took place (eg, there was no significant difference between anticipated and actual difficulty of doll care), and BTIO had almost no effect on the student's childbearing intentions.

Several factors may have contributed to our inability to demonstrate the efficacy of BTIO in this population. First, only a minority (29%) of the students equated doll care with real infant care. Regardless of grade, those students who learned the most about the difficulties of parenting from the BTIO experience were also the least apt to equate BTIO care with real infant care. Indeed, they showed the strongest tendency to discount the difficulties they experienced caring for BTIO by rationalizing that they would find it easier to care for an infant of their own.

This finding challenges one of the key assumptions in the conceptual model underlying the BTIO program and many other adolescent pregnancy prevention programs, eg, programs that use eggs and sacks of flour as infant simulators<sup>12-16</sup>: that it is possible to discourage teenagers from engaging in unprotected sexual activity by creating simulated classroom experiences that emphasize the adverse consequences of such behavior. Unfortunately, there are only 2 published studies evaluating the efficacy of this approach to the prevention of teen pregnancy.<sup>14,16</sup> In 1 study, the investigators did show that teens find it difficult to care for BTIO and their findings implied that teenagers might equate their experience with BTIO with real infant care.<sup>16</sup> However, the results of

**TABLE 3.** Intended Childbearing Behavior

	Grade Level		
	Sixth (n = 68)	Eighth (n = 41)	All (n = 109)
Intended age at first birth (mean ± SD)			
Before caring for BTIO	22.3 ± 2.9	23.3 ± 2.9	22.7 ± 2.9
After caring for BTIO	22.9 ± 3.3	23.5 ± 2.8	23.1 ± 3.1
Plan to be a teen parent n (%)			
Before caring for BTIO	10 (13)	3 (7)	13 (12)
After caring for BTIO	12 (19)	4 (10)	16 (15)

our study demonstrate that, in this context, the propensity of young people to believe in the personal fable of omnipotence may allow them to simply overlook the negative aspects of any parenting experience they have. This is a very important finding because it suggests that, during adolescence, the link between knowledge and behavioral intention is not as tight as theories of behavioral change suggest. In part, this may be because the personal fable of omnipotence has a powerful impact on cognitive processes at this age.

A second factor that may have contributed to our inability to demonstrate the efficacy of BTIO is shown in Table 2. Because most students expected BTIO care to be difficult, there may have been little room for learning. We found it encouraging that, within this context, the students who anticipated that doll care would be easiest learned the most about the onerous nature of parenting by caring for BTIO. This is particularly true because girls who wanted to be teen parents tended to anticipate that it would be easier to care for BTIO than their peers who planned to postpone parenthood. Unfortunately, because those who learned the most about the difficulties of parenting were least apt to equate doll care with real infant care and most apt to think their infant would be easier to care for, the experience did not translate into a change in childbearing plans. Nevertheless, our finding that the anticipated difficulty of doll care was the only significant predictor of learning about the difficulties of parenthood may help educators target future intervention toward those who are most apt to benefit from the experience.

Finally, it is important to note that the manufacturer intended that BTIO should be part of a sex education program that includes the doll, worksheets, discussions, and written assignments. In contrast, we implemented the doll portion of the program in isolation. We did this because the students who participated in the study had already been exposed to a sex education program as part of their regular curriculum. Our finding that most students found BTIO difficult to care for supports the manufacturer's claim that caring for BTIO allows teens to experience the responsibilities of parenthood.<sup>15</sup> Because the students we studied were already participating in sex education and life skills courses, it is difficult to know if implementing the rest of the BTIO program would have helped them overcome their allegiance to the personal fable of omnipotence and improved the efficacy of the intervention. This issue could be explored in future studies of more racially and ethnically diverse populations. However, in light of our findings concerning the strength of the personal fable at this age, the results of this study suggest that during adolescence, pregnancy preven-

tion programs that only try to discourage parenthood are apt to be ineffective. Therefore, it might be preferable to focus future research efforts on intervention strategies that work with the personal fable and help adolescents develop future-oriented goals that are more desirable than, and incompatible with, early childbearing.<sup>23</sup>

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