

Self-efficacy as a moderator of negative and positive self-fulfilling prophecy effects: Mothers' beliefs and children's alcohol use

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Abstract

This research examined two issues relevant to self-fulfilling prophecies. First, it examined whether children's risk for alcohol use, as indicated by their self-efficacy to refuse alcohol from peers, moderated their susceptibility to negative and positive self-fulfilling prophecy effects created by their mothers. Second, it explored behavioral mediators that could be involved in the self-fulfilling process between mothers and children. Longitudinal data from 540 mother-child dyads indicated that (1) low self-efficacy children were more susceptible to their mothers' positive than negative self-fulfilling effects, whereas high self-efficacy children's susceptibility did not vary, (2) mothers' global parenting and children's perception of their friends' alcohol use partially mediated mothers' self-fulfilling effects, and (3) these mediators contributed to low self-efficacy children's greater susceptibility to positive self-fulfilling prophecy effects. The power of self-fulfilling prophecies, their link to social problems, and the potential for mothers' favorable beliefs to have a protective influence on adolescent alcohol use are discussed. Copyright © 2007 John Wiley & Sons, Ltd.

A prevailing theme in the psychological literature is that perceivers' false beliefs can shape the future behavior of targets – a process referred to as a self-fulfilling prophecy (Merton, 1948). Although the self-fulfilling prophecy has historically been characterized as powerful (Jussim, 1991), naturalistic research has not supported this claim. The power of naturally occurring self-fulfilling prophecy effects is typically small in magnitude (Jussim, 1991; Jussim & Eccles, 1995; Jussim, Eccles, & Madon, 1996). However, these small effects represent averages that do not take into consideration the possibility that self-fulfilling prophecies may be more powerful under some conditions or among particular targets.

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Accordingly, much of the recent work addressing self-fulfilling prophecies has focused on potential moderators of the process (see Jussim et al., 1996; Jussim & Harber, 2005, for reviews). The current research contributes to this effort by investigating whether targets' self-views interact with the favorableness of perceivers' inaccurate beliefs to influence the power of naturally occurring self-fulfilling prophecy effects.

The term self-fulfilling prophecy was first introduced to the social sciences by Merton (1948). A sociologist by training, Merton proposed that self-fulfilling prophecies had the potential to create large scale social problems such as bank runs and discrimination against ethnic minorities. Although Merton's analysis was purely theoretical, it resulted in literally hundreds of experimental investigations of the self-fulfilling prophecy process (see Rosenthal & Rubin, 1978; Snyder, 1984, 1992; Snyder & Stukas, 1999, for reviews). This large body of experimental work is critically important because it provides strong evidence that the self-fulfilling prophecy is a real phenomenon that can occur when perceivers hold false beliefs about targets.

However, the experimental approach cannot address the extent to which self-fulfilling prophecies characterize interpersonal relationships in the real world (Jussim, 1989). In the typical experiment, researchers artificially induce false beliefs in perceivers by providing them with invalid information about targets. In most cases, this invalid information constitutes the only information that perceivers have about targets; a situation that contrasts with the naturalistic environment in which perceivers typically have at least some valid information about targets on which to base their beliefs (Madon, Smith et al., 2001). Because only inaccurate beliefs can be self-fulfilling, the availability of valid information reduces the potential for perceivers to influence targets' behavior by means of a self-fulfilling prophecy. In addition, ethical considerations preclude experiments from testing whether self-fulfilling prophecies can have negative influences on important outcomes. For example, it would be unethical to falsely lead parents to believe that their child is at risk for alcohol use in order to examine whether that belief increases their child's actual use of alcohol during adolescence.

Concerns regarding the external validity of experimental findings and the potential for self-fulfilling prophecies to have negative influences on important target outcomes have prompted researchers to examine self-fulfilling prophecies in naturalistic contexts using correlational data (for reviews, see Jussim & Eccles, 1995; Jussim et al., 1996; Jussim & Harber, 2005). Consistent with the self-fulfilling prophecy process, this literature indicates that perceivers' beliefs about targets predict targets' subsequent outcomes beyond the effect of predictive accuracy, as captured by the inclusion of relevant control variables. For example, the beliefs that teachers naturally develop about their students' academic potential predict their students' year-end achievement after accounting for predictors of student achievement, such as students' previous achievement, effort, and motivation (Jussim, 1989; Jussim & Eccles, 1992). Likewise, the beliefs that parents naturally develop about their children's alcohol use predict their children's alcohol use 1–5 years later after accounting for predictors of adolescent alcohol use, such as children's past alcohol use, their own expectations for future alcohol use, and their access to alcohol (Madon, Guyll, Spoth, Cross, & Hilbert, 2003; Madon, Guyll, Spoth, & Willard, 2004; Madon, Willard, Guyll, Trudeau, & Spoth, 2006). However, the magnitude of naturally occurring self-fulfilling prophecy effects is typically small, rarely exceeding 0.1–0.2 in terms of standardized regression coefficients (Jussim, 1991).

THE MODERATING EFFECT OF A BELIEF'S VALENCE ON NATURALLY OCCURRING SELF-FULFILLING PROPHECIES

Even though it is now well-established that naturally occurring self-fulfilling prophecy effects are modest in terms of their magnitude, there are conditions under which, and targets for whom, such

effects could be relatively powerful. For example, social scientists have been interested in the differential power of negative and positive self-fulfilling prophecy effects (Babad, Inbar, & Rosenthal, 1982; Madon et al., 2003, 2004; Sutherland & Goldschmid, 1974). Negative self-fulfilling prophecy effects are more powerful than positive ones when unfavorable beliefs elicit confirmatory behavior to a greater extent than do favorable beliefs, such as when teachers' unfavorable beliefs cause larger decreases in students' achievement than their favorable beliefs cause increases. Positive self-fulfilling prophecy effects, in contrast, are more powerful than negative ones when favorable beliefs elicit confirmatory behavior to a greater extent than do unfavorable beliefs, such as when teachers' favorable beliefs cause larger increases in students' achievement than their unfavorable beliefs cause decreases.

Research relevant to these processes has tended to emphasize the potentially greater power of negative self-fulfilling prophecy effects. For example, self-fulfilling prophecies have historically been linked to social problems by virtue of their tendency to contribute to (rather than to ameliorate) social inequalities (Klein & Snyder, 2003); to undermine (rather than to enhance) the academic achievement of minority students (Rosenthal & Jacobson, 1968); and to fuel (rather than to reduce) discrimination and discriminatory policies (Merton, 1948). Such perspectives suggest that self-fulfilling prophecies harm targets more than they help them, and that this tendency is strongest among those targets who can least afford it. According to this line of reasoning, therefore, targets who are at greater risk for negative outcomes are particularly susceptible to negative self-fulfilling prophecy effects.

However, there is only one empirical study bearing on this hypothesis and that study's findings did not support it. Madon, et al. (1997) found that there was a slight, non-significant tendency for students who were at greater risk for academic underachievement to be more susceptible to their teachers' positive (rather than negative) self-fulfilling effects than students who were at lower risk. Although this trend runs counter to the hypothesis that self-fulfilling prophecies tend to have particularly harmful effects among targets most at risk for negative outcomes, the statistical weakness of the finding and the lack of any additional empirical evidence makes it impossible to draw conclusions, and perhaps most clearly highlights the need for additional investigation.

OVERVIEW OF RESEARCH

In this article, we use data from community sample of mothers and their young adolescent children to address two issues relevant to targets' risk status and their susceptibility to self-fulfilling prophecy effects. The first issue we address is whether children's risk for alcohol use, as indicated by their self-efficacy to refuse alcohol from peers, moderates their susceptibility to negative and positive self-fulfilling prophecy effects. Our investigation of this issue extends our own past work on moderators of the self-fulfilling prophecy process between mothers and children. Specifically, in other research using a sub-sample of these data (Madon et al., 2003) we found that children were generally more susceptible to positive than negative self-fulfilling prophecy effects. In addition, this heightened susceptibility was similar regardless of whether children's global self-esteem was low or high. Although these findings appear to suggest that children's self-views are not related to their susceptibility to negative and positive self-fulfilling prophecy effects, our outcome variable of interest – children's alcohol use – is highly specific and may not have been a good match with the global measure of children's self-esteem that we used in that research. Indeed, both theoretical and empirical research point to the utility of focusing on specific self-views over more global ones, especially when assessing specific outcomes (e.g., Swann, Pelham, & Krull, 1989; Swann, Chang-Schneider, & McClarty, 2007).

Therefore, in this research we further investigate the moderating influence of children's self-views on their susceptibility to negative and positive self-fulfilling prophecy effects, but do so with a specific measure of children's self-views—their self-efficacy to refuse alcohol from peers. In contrast to global self-esteem which reflects an individual's general self-worth (Harter, 1993), self-efficacy is domain specific, referring to an individual's perceived ability to successfully perform a task or behavior within a particular context (Bandura, 1977). Self-efficacy is believed to originate from *performance accomplishments* (e.g., personal experiences), *vicarious experiences* (e.g., observational learning), *verbal persuasion* (e.g., encouragement from others), and *emotional arousal* (e.g., anxiety; Bandura, 1977, p. 80; also see Bandura, 1997). Research suggests that children's self-efficacy to refuse alcohol from peers stems, in large part, from factors associated with the family such as parental monitoring, quality of the parent–child relationship, number of parents who drink alcohol in the home, and parental disapproval of alcohol use (Boyd, Ashcraft, & Belgrave, 2006; Li, Pentz, & Chou, 2002; Nash, McQueen, & Bray, 2005; Watkins, Howard-Barr, Moore, & Werch, 2006). Moreover, self-efficacy has been shown to influence motivation and behavioral outcomes (Bandura & Locke, 2003). For example, within in the alcohol use literature, self-efficacy is related to transgressive conduct including engaging in underage alcohol use during adolescence (e.g., Caprara, Regalia, & Bandura, 2002; Caprara et al., 1998).

The second issue we address concerns potential behavioral mediators of the self-fulfilling prophecy process among mothers and children. The behavioral mediators that we consider are relevant to family interaction processes and include variables that pertain to parenting behaviors, such as how parents structure their children's time, family rules and standards, and disciplinary practices. These variables map on to a taxonomy of parenting behaviors developed by Harris (1993). Harris proposes that parents' beliefs are communicated to children through their enactment of their parenting behaviors, thereby increasing the likelihood that parents will elicit confirmatory behavior from their children. For example, parents who expect their child to refrain from substance use may believe that their child will enjoy normative activities, such as sports, band, theater, or summer camp. Accordingly, parents with favorable beliefs may facilitate their child's participation in these activities. In this manner, a child's time may be more structured and monitored by responsible adults, thereby reducing both the child's opportunities to develop friendships that promote alcohol use and the child's ability to access alcohol (Catalano & Hawkins, 1996). Consistent with Harris' analysis, therefore, we examine whether mothers' global parenting, children's friends' alcohol use, and children's access to alcohol mediate mothers' self-fulfilling effects on their subsequent alcohol use. In addition, we also examine whether these variables can account for any differences in the susceptibility of low and high self-efficacy children to their mothers' negative and positive self-fulfilling effects. No previous research of which we are aware has empirically examined behavioral mediators of the self-fulfilling prophecy process between mothers and children.

ANALYTIC FRAMEWORK

The reflection–construction model of social perception (Jussim, 1991) relates perceivers' beliefs to targets' subsequent outcomes and provides the analytic framework for this research. Figure 1 presents an adaptation of this model showing causal relations between mothers' beliefs and children's subsequent alcohol use. When presenting the model, we describe relations with causal language wherever the model proposes causal relationships to exist. However, because we are examining these relations with correlational data we phrase the relations under investigation in terms of variables “predicting”, rather than “causing”, other variables.

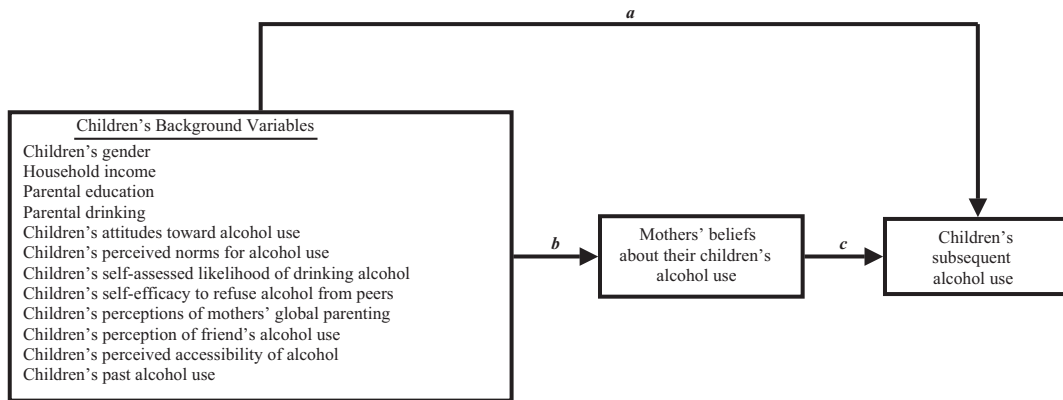


Figure 1. Adaptation of the reflection-construction model (Jussim, 1991). This model shows relations among background variables related to children's alcohol use, mothers' beliefs about their children's alcohol use, and children's subsequent alcohol use. According to the model, children's background variables influence their subsequent alcohol use (Path a) and mothers' beliefs (Path b). Mothers' beliefs can also influence their children's subsequent alcohol use through self-fulfilling prophecies (Path c)

Predictive Accuracy

The model proposes that valid background variables of adolescent alcohol use influence both children's subsequent alcohol use (Path a) and mothers' beliefs about their children's alcohol use (Path b). The model further proposes that mothers' beliefs are accurate to the extent that they are based on these valid background variables. According to the model, therefore, the accurate portion of the relationship between mothers' beliefs and children's subsequent alcohol use is entirely contained in the effect represented by Path a.

Self-Fulfilling Prophecies

Only the inaccurate portion of a belief can be self-fulfilling (Merton, 1948). The model defines mothers' beliefs as being inaccurate to the extent that they are not based on background variables related to adolescent alcohol use. Because the accuracy-based portion of the zero-order relationship between mothers' beliefs and children's subsequent alcohol use is entirely included in the effect represented by Path a, Path c represents the ability of the inaccurate portion of mothers' beliefs to influence children's subsequent alcohol use by means of a self-fulfilling prophecy (Jussim, 1991).

Background Variables

The accurate estimation of mothers' self-fulfilling effects on children's subsequent alcohol use depends on the quality and breadth of the background variables included in the model. If relevant background variables are omitted, then the effects attributed to mothers' self-fulfilling influences may be overestimated and the accuracy of mothers may be underestimated. Thus, the various background variables used in this research were selected on the basis of an extensive body of research regarding precursors of alcohol use among adolescents (Catalano & Hawkins, 1996; Hawkins, Catalano, &

Miller, 1992). These factors include child gender, family social class, parental drinking behavior, children's attitudes toward alcohol use, children's perceived norms for adolescent alcohol use, children's self-assessed likelihood of drinking alcohol in the future, children's self-efficacy to refuse alcohol from peers, children's perceptions of their mothers' global parenting, children's perceptions of their friends alcohol use, children's perceptions of the accessibility of alcohol, and children's past alcohol use.

METHOD

Participants

Data were obtained from families participating in the Capable Families and Youth Study (CaFaY; Spoth, Redmond, Trudeau, & Shin, 2002), a longitudinal, randomized, controlled preventive intervention trial focusing on the prevention of adolescent substance use and other problem behaviors. Participants were families of seventh graders enrolled in 36 rural schools in 22 counties in Iowa. Participating schools met the following criteria: school districts with enrollment of 1,200 or fewer, approximately 20% or more of households within 185% of the federal poverty level in the school district, and having all middle school grades taught in one location. Data collected through public records and a prospective telephone survey of randomly selected parents of children projected to be eligible for the study provided school district information on variables deemed relevant to the development of adolescent problem behaviors, including family socioeconomic status (i.e., parent educational attainment and family income), family risk (i.e., child problem behaviors, a lack of parent information and support seeking, and single parenthood), school grade structure (seventh graders located in the same school as high school students), and the geographic distance of the community in which the school was located to the nearest city of 50,000 or more. Schools were matched on these characteristics to form blocks of three schools each (Spoth, Randall, Shin, & Redmond, 2005).

The three schools within each block were randomly assigned to the three experimental conditions. Thus, on the basis of the schools attended by participating children, families were assigned either to one of two intervention conditions or to a control condition (see Spoth, Redmond et al., 2002). The interventions were the *Life Skills Training* program (Botvin, 2000) and the *Strengthening Families Program* (Molgaard, Kumpfer, & Fleming, 1997). Although the effect of condition was statistically controlled in all analyses, intervention effects are not the focus of this study and are not discussed further. This study used data from 540 mother-child dyads, including 283 boys and 257 girls, who provided data for all variables used in the analyses. Consistent with the geographic catchment area from which the participants were sampled, children's ethnicity was as follows: 501 European Americans, 2 African Americans, 3 Native Americans, 1 Asian, and 33 for whom ethnicity was not reported. At Wave 1, mothers averaged 39 years and children averaged 12 years. Only one child per family participated in this study.

Procedure

Research staff verbally assessed some demographic information and also administered written questionnaires to family members who completed them individually and in separate rooms of their residence. Participants were informed that their responses were confidential and would not be communicated to other family members. Family members completed the assessments at baseline and again at a follow-up 18 months post-baseline.

Measures

All variables used in the current study were assessed with written questionnaires, with the exception of parental education which was assessed during the verbal interview portion of the data assessment. The questionnaires assessed variables related to family, peers, and substance use. The current study uses the following variables assessed at baseline: mothers' beliefs and the background variables (see Table 1). It also uses the following variables assessed at the 18-month follow-up: children's perceptions of their mothers' global parenting, friend's alcohol use, and accessibility of alcohol, all of which were also assessed at baseline as part of the background variables. Also assessed at the 18-month follow-up was the outcome variable of children's alcohol use. We next describe these variables in detail.

Family Social Class

Family social class was estimated with items that assessed household income and parental education. Parents reported their household's total income from all sources and reported the highest educational level they had achieved. The average total household income at baseline in 1998 was \$ 43,183 (median = \$ 40,000; $SD = 23.56$). Responses pertaining to parental education were assigned a value of 0 through 20 (e.g., 0 = *no education*, 12 = *high school diploma or GED*, 16 = *Bachelor's*, 18 = *Master's*, 20 = *Ph.D., M.D., etc.*). Over 95% of parents completed high school or its equivalent. For dual-parent households, mothers' and fathers' responses were averaged to create two variables per child, one pertaining to family income and the other to parental education. At baseline, the correlation between family income and parental education was $r = .34$, $p \leq .01$.

Parental Drinking

Two variables assessed parental drinking: parental drinking status and amount of parental drinking. Parental drinking status was assessed by asking parents whether they had any alcohol during the past year (0 = *No*; 1 = *Yes*). For dual parent households, responses were coded as 0 if both parents answered "No" and as 1 if either parent answered "Yes". Amount of parental drinking was measured by asking parents how many days in the past month they had (a) four or more alcoholic drinks, (b) only two or three alcoholic drinks, and (c) only one alcoholic drink. We combined responses to these three items to create a single value reflecting the total number of alcoholic drinks consumed during the past month. For dual parent households, the total number of alcoholic drinks consumed by mothers and fathers were averaged to yield a single score. The amount of parental drinking in the past month ranged from 0 to 123 ($SD = 16.03$).

Attitudes Toward Drinking Alcohol

Children's attitudes toward drinking alcohol were assessed by asking children the extent to which they believed that (a) drinking alcohol makes it hard to get along with friends, (b) drinking alcohol gets in the way of school work, and (c) people make fools of themselves after a few drinks of alcohol (1 = *Definitely yes*; 4 = *Definitely no*). Responses were averaged to yield one score for each child ($\alpha = .77$; $SD = 0.81$). Higher values indicate greater perceived rewards for drinking alcohol.

Table 1. Intercorrelations and descriptive data for demographic and alcohol relevant variables ($N = 540$)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Baseline assessment																		
(1) Gender ^a	.06																	
(2) Household income	.34**	.06																
(3) Parental education	-.06	.07	.02															
(4) Parental drinking status	.24**	-.06	-.09*	-.09*	.05	.18**	-.11**	.05	.18**	-.11**	.06	-.06	-.06	-.14**	.09*	-.06	-.02	-.15**
(5) Amount of parental drinking	.07	.07	.03	.03	.13**	-.02	-.13**	.01	.05	-.02	-.13**	.01	.05	.07	-.03	.03	.02	.04
(6) Attitudes toward drinking alcohol	.11	.12**	-.01	-.03	.02	-.01	.02	-.01	.07	-.01	.07	.08	.10*	.17**	-.05	.13**	.12**	.14**
(7) Norms for adolescent alcohol use	.42**	.42**	-.025**	-.026**	.41**	.19**	.39**	.16**	.19**	.39**	.16**	.17**	.26**	.16**	-.017**	.26**	.12**	.23**
(8) Self-assessed likelihood of drinking	-.32**	-.32**	-.29**	-.29**	.47**	.32**	.54**	.30**	.32**	.54**	.30**	.25**	.46**	.30**	-.25**	.46**	.30**	.48**
(9) Self-efficacy	.20*	.20*	-.28**	-.28**	.20*	-.28**	-.28**	.20*	-.28**	-.28**	.20*	-.28**	.20*	-.28**	.20*	-.28**	.20*	-.28**
(10) Mother's global parenting	-.26**	-.26**	-.10*	-.10*	-.26**	-.10*	-.10*	-.26**	-.10*	-.10*	-.26**	-.10*	-.10*	-.26**	-.10*	-.10*	-.26**	-.10*
(11) Friends' alcohol use	.31**	.31**	.50**	.50**	.31**	.50**	.31**	.50**	.31**	.50**	.31**	.50**	.31**	.50**	.31**	.50**	.31**	.50**
(12) Accessibility of alcohol	.26**	.26**	.12**	.12**	.26**	.12**	.12**	.26**	.12**	.12**	.26**	.12**	.12**	.26**	.12**	.12**	.26**	.12**
(13) Past alcohol use	.20**	.20**	-.21**	-.21**	.20**	-.21**	-.21**	.20**	-.21**	-.21**	.20**	-.21**	.20**	-.21**	-.21**	.20**	-.21**	-.21**
(14) Mothers' belief raw score ^b	.20**	.20**	-.21**	-.21**	.20**	-.21**	-.21**	.20**	-.21**	-.21**	.20**	-.21**	.20**	-.21**	-.21**	.20**	-.21**	-.21**
18-month follow-up assessment																		
(15) Mother's global parenting																		
(16) Friends' alcohol use																		
(17) Accessibility of alcohol																		
(18) Children's subsequent alcohol use																		
M	52% ^c	43.183	13.39	11% ^d	11.29	1.66	1.13	1.79	76% ^e	5.51	1.29	1.66	.31	3.29	5.41	1.69	2.47	.99
SD	—	23.56	1.70	—	16.03	.81	.35	.87	—	.77	.55	.98	1.20	1.58	.87	.80	1.21	2.13
α	—	—	—	—	—	.77	.68	.74	.86	.82	.82	—	.91	.66	.90	.87	—	.93

Note: Correlations are shown above the diagonal. M = mean. SD = standard deviation. α = internal consistency. The following variables refer to children's perceptions and are based on children's reports: attitudes toward drinking, norms for adolescent alcohol use, self-efficacy, mothers' global parenting, friends' alcohol use, and accessibility of alcohol. ^aFor gender, boys were coded as 1 and girls were coded as 2. ^bCorrelation results for mother belief raw scores are provided in lieu of those for mother belief residuals because the latter were generated by regressing mother belief raw scores on all other predictor variables, thereby yielding correlations equal to 0. However, mother belief residuals did correlate with the dependent variable, subsequent alcohol use, $r = .10, p \leq .05$. ^cValue reflects percentage of children who were boys. ^dValue reflects percentage of households that reported no drinking in the past year. ^eValue reflects percentage of children who were coded as having high self-efficacy. * $p \leq .05$. ** $p \leq .01$.

Norms for Alcohol Use

Children's beliefs about the acceptability of adolescent alcohol use were assessed by asking children how wrong they believe it is for someone their age to (a) drink alcoholic beverages and (b) drink enough alcohol to get drunk (1 = *Not at all wrong*; 4 = *Very wrong*). Responses were reversed scored and averaged to yield one variable per child ($\alpha = .68$; $SD = 0.35$). Higher values reflect the belief that alcohol use is more normative.

Self-Assessed Likelihood of Drinking Alcohol

Children's beliefs about their likelihood of drinking alcohol in the future was assessed by asking them how likely they are to (a) drink alcohol before they are 21 years old, (b) drink alcohol after they are 21 years old (1 = *Definitely yes*; 4 = *Definitely no*), and (c) drink alcohol during the next year (1 = *Definitely not*; 5 = *Definitely will*). To combine items into a single scale we re-scaled the four-point scale responses into a five-point scale format (i.e., 1 \rightarrow 1.0; 2 \rightarrow 2.33; 3 \rightarrow 3.67; 4 \rightarrow 5.0). Items were reversed scored as necessary and then averaged to produce a single score for each child ($\alpha = .74$; $SD = 0.87$). Higher values reflect a greater self-assessed likelihood of drinking alcohol in the future.

Self-Efficacy to Refuse Alcohol

Children's self-efficacy to refuse alcohol from peers was assessed by asking children how well they can resist pressure from their friends to (a) drink alcohol and (b) drink enough to get drunk (1 = *Not well at all*; 4 = *Very well*). We summed children's responses to these two items and then dichotomized the summed responses by means of a median split with scores below and above the median assigned values of 0 and 1, respectively. Two points regarding the measure of self-efficacy are worth noting. First, even though children's self-efficacy was assessed with only two items, the reliability of these items was nonetheless relatively high ($\alpha = .86$). One reason for their relatively high reliability might be that the construct of children's self-efficacy to refuse alcohol from peers is straightforward, specific, and circumscribed, thereby enabling two, content saturated items to obtain good coverage of the construct. Consistent with this reasoning, Burisch (1997) has shown that under such conditions scale validity peaks between two to four items, suggesting that a two item scale can provide a reliable measure of a construct. In any event, it is worthwhile to note that any unreliability introduced by having measured children's self-efficacy with only two items would have tended to increase random error variance. As a result, the statistical significance levels that we report for relationships involving children's self-efficacy are most likely conservative. Second, we dichotomized children's responses to the self-efficacy items to reduce the potential influence of extreme scores. Additional analyses that used children's raw score responses to the self-efficacy items yielded results that were in all ways consistent with the findings from the analyses of the dichotomized responses.

Mother's Global Parenting

Children's perceptions of their mother's global parenting were assessed with 20 items that assessed several family-centered factors, including the affective quality of the mother-child relationship (e.g., "During the past month when you and your mom have spent time talking or doing things together, how often did she get angry at you?"), standard setting (e.g., "How often does your mom ask you what you

think before making a decision that affects you?”), monitoring of child behavior (e.g., “How often does your mom know when you get into trouble at school or some place else away from home?”), and discipline (e.g., “When you do something wrong and your mom decides on the discipline, how often can you get out of it?”). The affective quality items were assessed with 7-point scales (1 = *Always*; 7 = *Never*), whereas the remaining items were assessed with 5-point scales (1 = *Almost always*; 5 = *Almost never*). To combine the items into a single scale we re-scaled the 5-point scale responses into a 7-point scale format (i.e., 1 → 1.0; 2 → 2.5; 3 → 4.0; 4 → 5.5; 5 → 7.0), reversed scored the items as necessary, and then averaged the 20 items at each wave to create two scores, one at baseline ($\alpha = .86$; $SD = 0.77$) and another at the 18-month follow-up ($\alpha = .90$; $SD = 0.87$). Higher values reflect more positive perceptions of mothers’ global parenting. The entire scale is available in Madon et al. (2003) and by request.

Friends’ Alcohol Use

Children’s perceptions of their friends’ alcohol use were assessed with four items that asked children how many of their friends (a) drink alcoholic beverages and (b) get drunk at least once a week (1 = *None*; 5 = *All*); and how many of their close friends have (c) drunk beer, wine, wine coolers or liquor and (d) have drunk enough beer, wine, wine coolers or liquor to get drunk (1 = *None of them*; 5 = *All of them*). We averaged item responses at both waves to create two scores per child, one at baseline ($\alpha = .82$; $SD = 0.55$) and another at the 18-month follow-up ($\alpha = .87$; $SD = 0.80$). Higher values indicate greater perceived alcohol use among friends.

Accessibility of Alcohol

Children’s perceived ability to access alcohol was assessed by asking children whether they could obtain alcohol if they had the money (1 = *Definitely yes*; 4 = *Definitely no*). Responses were reversed scored so that higher values correspond to a greater perceived ability to obtain alcohol. Children answered this item at baseline ($SD = 0.98$) and then again at the 18 month follow-up ($SD = 1.21$).

Alcohol Use

Children’s alcohol use was assessed by asking children (a) how often they currently drink alcohol, (b) how often they currently drink alcohol without a parent’s permission (1 = *Not at all*; 7 = *About every day*), (c) how often they usually get drunk (1 = *Not at all*; 7 = *About once a day*), (d) about how much (if at all) they usually drink each time they drink (1 = *I don’t drink alcohol*; 5 = *More than 6 drinks*), (e) how many times they had an alcoholic beverage during the past year, (f) how many times they have had an alcohol beverage without a parents permission during the past year, (g) how many times they have been drunk in the past month, and (h) how many times they had three or more alcoholic beverages in a row during the past month (open-ended). To combine the items into a single scale we first dichotomized each response by assigning a value of 0 to responses indicating no drinking or drunkenness (i.e., responses corresponding to the lowest possible value) and a value of 1 to responses indicating any drinking or drunkenness (i.e., responses corresponding to all but the lowest possible value). We then summed these eight dichotomized responses at baseline ($\alpha = .91$; $SD = 1.20$) and at the 18-month follow-up ($\alpha = .93$; $SD = 2.13$). The 18-month follow-up measure, referred to as *children’s subsequent alcohol use* because it was measured after mothers’ beliefs were measured, constitutes the dependent variable in all of the main analyses.

Mothers' Beliefs

Mothers' beliefs about their children's alcohol use were assessed by asking mothers how likely it is that their child (a) will drink alcohol regularly as a teenager (1 = *Certain that this will not happen*; 10 = *Certain that this will happen*), (b) would just say no and walk away if offered a drink by a friend at a party, and (c) would drink alcohol if offered a drink by a friend at a party (1 = *Very likely*; 5 = *Very unlikely*). Responses to the lattermost item were reverse scored. The two items assessed on a five-point scale were re-scaled into a 10-point scale (i.e., 1 → 1.0; 2 → 3.25; 3 → 5.5; 4 → 7.75; 5 → 10.0). Responses to the three items were then averaged to produce a single score for each mother ($\alpha = .66$; $SD = 1.58$). Higher values reflect the belief that a child is more likely to drink alcohol.

RESULTS**Preliminary Analyses***Non-Independence and Multicollinearity*

The data used in this research were hierarchically structured with children clustered within schools and schools matched to form blocks of three schools each. These cluster variables represent characteristics of the children's school district and characteristics of the family's community. Traditional data analytic procedures are inappropriate for hierarchically structured data because they assume independence of individual observations and, as a result, tend to underestimate parameter variances and bias significance tests toward rejection of the null hypothesis (Cochran, 1977; Kreft & de Leeuw, 1998). To correct for the effects related to clustering we performed analyses using SAS PROC MIXED, which adjusts the standard errors associated with the parameter estimates. These analyses used restricted maximum likelihood estimation, identified blocks and schools nested within blocks as random effects, and identified the individual level effects as fixed. Because the individual level effects are fixed, we identify the individual level coefficients as γ , which is consistent with the notation of Bryk, et al. (1996). We also report standardized measures of effect size (i.e., standardized γ ; see Snijders & Bosker, 1999) to facilitate comparison of our findings to those reported in the literature. Standardized γ s are reported in the text. Both standardized and unstandardized γ s are reported in the table of results. Because the individual level effects are fixed, the values of γ and standardized γ in the current investigation may be interpreted as unstandardized and standardized regression coefficients, respectively, as would be obtained from a typical regression analysis. All individual level variables were centered around grand means to reduce multicollinearity (Cohen & Cohen, 1983).

Descriptive Statistics

Table 1 presents the means, standard deviations, and intercorrelations for individual level variables.

The Valence of Mothers' Beliefs

In order to test the hypothesis that children's self-efficacy to refuse alcohol from peers moderates their susceptibility to negative and positive self-fulfilling prophecy effects it was necessary to identify

whether each mother's inaccurate belief about her child's alcohol use was more or less favorable than was justified. Consistent with past research (Madon et al., 1997, 2003, 2006; Madon, Smith et al., 2001), we accomplished this empirically by saving the residuals from an analysis that regressed mothers' raw score beliefs on the cluster and background variables. A mother's belief residual greater than zero reflects an unfavorable belief because it overestimates her child's alcohol use in comparison to what was predicted by the child's background variables. A mother's belief residual less than zero reflects a favorable belief because it underestimates her child's alcohol use in comparison to what was predicted by the child's background variables. A mother's belief residual approximating zero reflects a relatively accurate belief about her child's alcohol use because it corresponds closely to what was predicted by her child's background variables.

Preliminary Relationships

A previously published article based on a sub-sample of the data examined herein reported the extent to which the cluster variables, background variables, and mothers' belief residuals predicted children's subsequent alcohol use (Madon et al., 2003). These previously reported relationships correspond to preliminary steps in the current study because they provided evidence that mothers had self-fulfilling effects on their children's subsequent alcohol use, thereby warranting further investigation into the moderating influence of children's self-efficacy on mothers' negative and positive self-fulfilling effects. To avoid undue lengthiness and to maintain focus on the unique contributions of the current study, we refer readers interested in detailed information about these preliminary relationships to the cited article. However, for completeness, we do report the specific coefficients and significance values of the individual level variables with respect to the current sample in Table 2, which essentially reproduce those reported previously.

Main Analyses

Self-Efficacy as a Moderator of Negative and Positive Self-Fulfilling Prophecy Effects

A multiple regression analysis tested whether children's self-efficacy to refuse alcohol from peers moderated their susceptibility to negative and positive self-fulfilling prophecy effects. This analysis regressed children's alcohol use on the cluster variables, the background variables (which includes children's self-efficacy), mothers' belief residuals, and three product terms. Product terms were necessary because the hypothesized relationship under investigation corresponds to an interaction effect. Specifically, the self-fulfilling effect of mothers' beliefs on children's subsequent alcohol use is expected to vary across the range of mothers' belief residuals and this variation is expected to differ depending on the level of children's self-efficacy to refuse alcohol from peers. To account for the possibility that the self-fulfilling effect of mothers' belief residuals on children's subsequent alcohol use may vary across the range of mothers' belief residuals, we created a quadratic product term by squaring mothers' belief residuals (Judd & McClelland, 1989). To account for the possibility that children's self-efficacy to refuse alcohol from peers may moderate the linear relationship between mothers' belief residuals and children's subsequent alcohol use, we created a product term by multiplying mothers' belief residuals by children's self-efficacy. Finally, to test whether children's self-efficacy to refuse alcohol from peers moderates their susceptibility to negative and positive self-fulfilling prophecy effects, we created a product term consisting of mothers' belief residuals squared multiplied by children's self-efficacy to refuse alcohol from peers (Judd & McClelland, 1989).

Table 2. Moderating influence of children's self-efficacy on their susceptibility to negative and positive self-fulfilling prophecy effects (N = 540)

Variable	Unstandardized γ	SE	Standardized γ
Background variables:			
Gender	.06	.16	.01
Household income	.00	.00	.00
Parental education	-0.12	.05	-0.09*
Parental drinking status	-0.20	.27	-0.03
Amount of parental drinking	.01	.01	.06
Attitudes toward drinking alcohol	-0.02	.03	-0.01
Norms for adolescent alcohol use	-0.17	.26	-0.03
Self-assessed likelihood to drink	.88	.12	.36**
Self-efficacy to refuse alcohol	.18	.20	.04
Mother's global parenting	-0.04	.11	-0.01
Friends' alcohol use	.51	.18	.13**
Accessibility of alcohol	.17	.09	.08
Past alcohol use	.14	.09	.08
Mothers' beliefs			
Mothers' belief residuals	.14	.06	.10**
Product terms			
Mothers' belief residuals squared	-0.02	.03	-0.04
Mothers' belief residuals \times self-efficacy	-0.05	.15	-0.01
Mothers' belief residuals squared \times self-efficacy	.13	.07	.10*

Note: The dependent variable was children's alcohol use which was assessed approximately 18 months after mothers' beliefs were assessed. SE refers to standard error. The following variables refer to children's perceptions and are based on children's reports: attitudes toward drinking, norms for adolescent alcohol use, self-efficacy to refuse alcohol, mothers' global parenting, friends' alcohol use, and accessibility of alcohol. Mothers' belief residuals were created by regressing mothers' belief raw scores on the cluster variables of school and block plus the set of background variables (which included children's self-efficacy). Variables were entered into the regression model in three steps: the background variables were entered first, mothers' belief residuals were entered second, and the three product terms were entered third. All coefficients correspond to those obtained when the variables were first entered in the model. * $p \leq 0.05$. ** $p \leq 0.01$.

Results indicated that the product of mothers' belief residuals squared \times children's self-efficacy significantly predicted children's subsequent alcohol use (standardized $\gamma = .10$, $p \leq .05$), whereas neither of the other product terms achieved statistical significance (standardized γ s $\leq -.04$; p s $> .05$, Table 2).

To examine the pattern of the higher order interaction, we graphed the predicted alcohol use of children with both high and low self-efficacy at each of the following levels of mothers' belief residuals: -1.00, -0.50, 00, +0.50, +1.00. These levels correspond to intervals for which there were at least 10 mother-child dyads. Figure 2 depicts the observed pattern and shows that, among low self-efficacy children, mother belief underestimates - which correspond to favorable beliefs - predicted children's subsequent alcohol use more strongly than did mother belief overestimates - which correspond to unfavorable beliefs. A different pattern emerged among high self-efficacy children. For these children, the relationship between mothers' belief residuals and children's subsequent alcohol use was nearly unchanged across the spectrum of mothers' belief residuals.

We also calculated effect sizes in terms of standardized coefficients for mothers' belief residuals equal to -1.00, -0.50, 00, +0.50, +1.00 for children with low and high self-efficacy scores (i.e., 0 and 1, respectively). For mothers' belief residuals ranging from -1.00 to +1.00, respectively, the effects sizes were +0.25, +0.18, +0.11, +0.04, -0.03 for low self-efficacy children and +0.10, +0.10, +0.11, +0.11, +0.11 for high self-efficacy children. These findings suggest that low self-efficacy children were more susceptible to their mothers' positive than negative self-fulfilling effects, whereas high self-efficacy children's susceptibility did not vary.

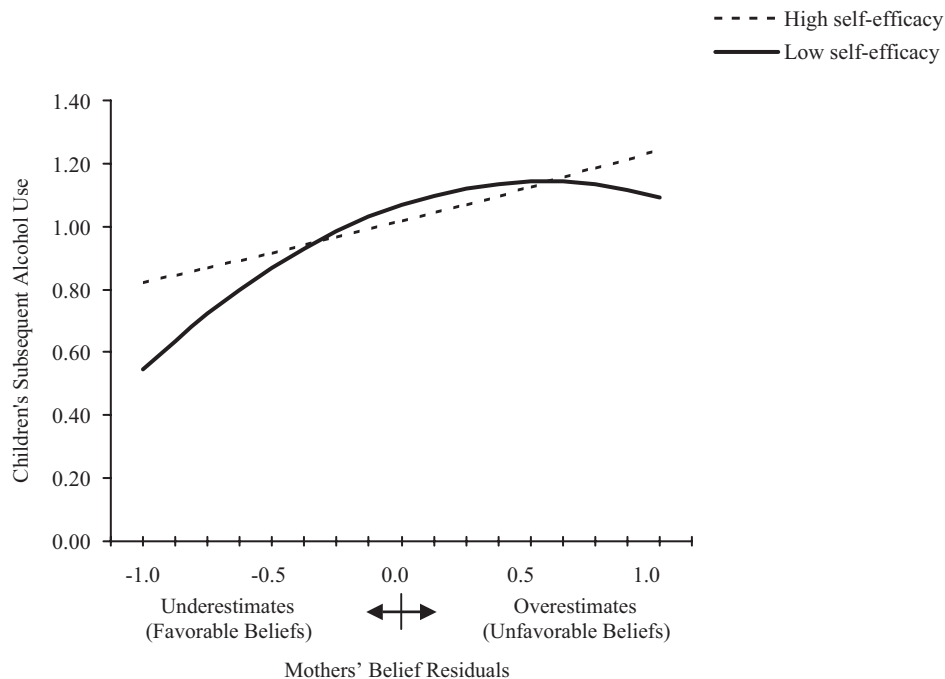


Figure 2. Mothers' belief residuals related most strongly to children's subsequent alcohol use when their beliefs were favorable and children's self-efficacy was low. Children's subsequent alcohol use represents the predicted alcohol use of children who were at the mean on all variables except mothers' belief residuals and children's self-efficacy

We also performed an additional analysis to test whether the moderating influence of children's self-efficacy on their susceptibility to negative and positive self-fulfilling prophecy effects was unique from any moderating effects due to children's global self-esteem by drawing on additional items in the survey pertaining to children's global self-esteem. This analysis regressed children's subsequent alcohol use on the cluster variables, background variables (which included children's self-efficacy), mothers' belief residuals, mothers' belief residuals squared, the three product terms involving children's self-efficacy described in the text, plus the following three new variables: children's global self-esteem scores, children's global self-esteem \times mothers' belief residuals, and children's global self-esteem \times mothers' belief residuals squared. Results indicated the product of mothers' belief residuals squared \times children's self-efficacy remained a significant predictor of children's subsequent alcohol use (standardized $\gamma = .10, p \leq .05$), whereas the product of mothers' belief residuals squared \times children's global self-esteem did not significantly predict children's subsequent alcohol use (standardized $\gamma = .10, p > .05$). These findings indicate that the moderating influence of children's self-efficacy on their susceptibility to negative and positive self-fulfilling prophecy effects was independent from any moderating effects of their global self-esteem. The self-esteem items used in this analysis are available in Madon et al. (2003) and by request.

Behavioral Mediators

Additional analyses explored behavioral mediators of mothers' self-fulfilling effects. First, we examined whether mothers' global parenting, children's perceptions of their friends' alcohol use, and

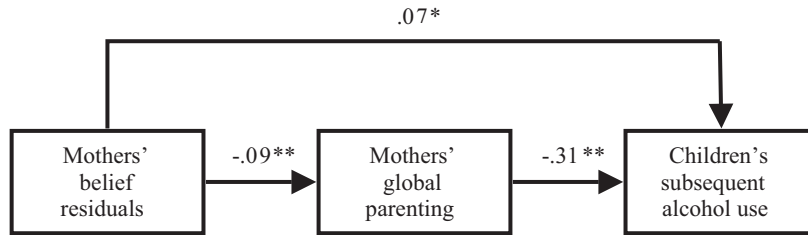


Figure 3. Meditational analyses. Mothers' global parenting mediated the relationship between mothers' belief residuals and children's subsequent alcohol use. $*p \leq .05$; $**p \leq .01$

children's perceived accessibility of alcohol (each assessed at the 18-month follow-up) mediated mothers' self-fulfilling effects on children's subsequent alcohol use. We tested for mediation by examining the significance of the indirect effects of mothers' belief residuals on children's subsequent alcohol use through each mediator using the procedure outlined by Sobel (1982). The Sobel test determines whether the indirect effect of a predictor variable on an outcome variable differs significantly from zero. The indirect effect is the effect of the predictor variable on the outcome variable that occurred through the hypothesized mediator. Excellent discussions of the Sobel test and its relation to the approach described by Baron and Kenny (1986) can be found in Preacher and Hayes (in press) and Preacher, Rucker, and Hayes (in press). In performing the Sobel test, we used Aroian's (1944) second-order Taylor series approximation to calculate the standard errors and included as controls the cluster and background variables. As shown in Figures 3 and 4, results were consistent with the interpretation that mother's global parenting, $z = 2.43$, $p \leq .05$, and children's perceptions of their friends' friends' alcohol use, $z = 2.01$, $p \leq .05$, mediated a significant portion of the effect of mothers' belief residuals on children's subsequent alcohol use. Results did not support the hypothesis that children's perceived accessibility of alcohol served as a mediator, $z = 0.20$, $p > .05$.

Second, having found that mothers' self-fulfilling effects on their children's subsequent alcohol use was partially mediated by mothers' global parenting and children's perceptions of their friend's alcohol use, we next examined whether these variables might be able to account for the tendency of low self-efficacy children to be more susceptible to positive than negative self-fulfilling prophecy effects. This analysis regressed children's subsequent alcohol use on the cluster variables, mothers' global parenting, children's perceptions of their friend's alcohol use, the background variables, and the three product terms described above (i.e., mothers' belief residuals \times children's self-efficacy, mothers' belief residuals squared, and mothers' belief residuals squared \times children's self-efficacy). Results indicated that the product of mothers' belief residuals squared \times children's self-efficacy was reduced to

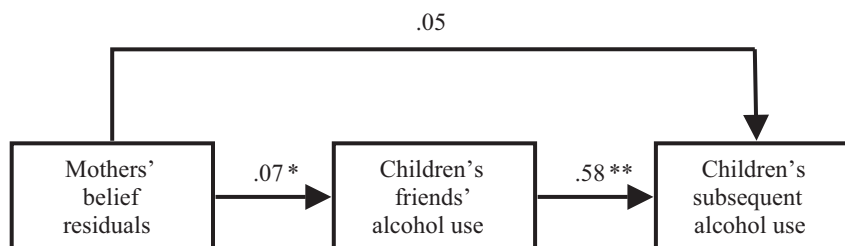


Figure 4. Meditational analyses. Children's friends' alcohol use mediated the relationship between mothers' belief residuals and children's subsequent alcohol use. $*p \leq .05$; $**p \leq .01$

non-significance by the inclusion of the two identified mediators, standardized $\gamma = .07$, $p = .11$. This result suggests that the tendency for low self-efficacy children to be more susceptible to positive than negative self-fulfilling prophecy effects was at least partially due to mothers' global parenting and children's perceptions of their friends' alcohol use.

DISCUSSION

This research examined whether children's risk for alcohol use, as indicated by their self-efficacy to refuse alcohol from peers, moderated their susceptibility to their mothers' negative and positive self-fulfilling effects. Results indicated that mother belief underestimates (which correspond to favorable beliefs) more strongly predicted low self-efficacy children's subsequent alcohol use than did mother belief overestimates (which correspond to unfavorable beliefs). Additional analyses indicated that mothers' global parenting and children's perceptions of their friend's alcohol use both partially mediated mothers' self-fulfilling effects on their children's subsequent alcohol use and that these mediators were able to account for low self-efficacy children's greater susceptibility to their mothers' positive self-fulfilling influence. Before discussing these findings, we address general issues associated with the interpretation of data from correlational studies and the relevance of these issues to the current investigation.

Interpreting Results from Correlational Data

Correlational designs do not provide as strong a basis for causal inference as do experimental designs. Although longitudinal designs, such as the one used in the present study, do rule out the possibility that the outcome caused changes in the predictors, they do not rule out the possibility that a third, unmeasured variable was responsible for changes in both the predictors and the outcome. The potential omission of a valid background variable characterizes all non-experimental research (Judd & McClelland, 1989) and raises the possibility that the effects attributed to self-fulfilling prophecies might instead have resulted from predictive accuracy. Thus, the results of our investigation are only valid to the extent that we have adequately measured valid background variables of children's alcohol use. Although we cannot categorically rule out predictive accuracy as an alternative interpretation of our findings, there are several reasons why we believe that a self-fulfilling prophecy interpretation is more tenable.

First, a self-fulfilling prophecy interpretation is consistent with a long line of experimental findings showing that perceivers' influence targets' future behaviors by means of self-fulfilling prophecy effects (e.g., Snyder, 1984, 1992; Snyder & Stukas, 1999). Although this convergence does not prove that our results reflect self-fulfilling prophecy effects, confidence in the validity of a general conclusion increases when naturalistic and experimental studies yield parallel findings.

Second, we included a large number of theoretically and empirically supported predictors of adolescent alcohol use. These background variables collectively explained approximately 30% of the variance in children's subsequent alcohol use, which is the amount of variance typically accounted for when predicting similar outcomes (Reid, 1991; Spoth, 1997). The inclusion of these background variables reduced the probability that a third unmeasured variable produced the relations between mothers' belief residuals and children's subsequent alcohol use.

Third, we explored the predictive accuracy interpretation empirically in two different ways and failed to find strong support for it. We first drew upon additional items in the survey that pertained to the

amount of time mothers and children spent together. We reasoned that a mother's belief about her child's alcohol use might be more accurate the more time she spends with her child. Accordingly, if predictive accuracy is responsible for our findings, then it should be the case that mothers and children spend the most time together when children's self-efficacy is low and mothers' beliefs underestimated children's alcohol use. However, results did not conform to this pattern. The amount of time that mothers and children spent together when children's self-efficacy was low (below median) versus high (above median) and mothers' belief residuals underestimated (below zero) versus overestimated (above zero) their children's alcohol use ranged from 2.7 to 2.9, with the value corresponding to the critical combination of *low self-efficacy-mother belief underestimates* equal to 2.8. Thus, in contrast to an accuracy interpretation of our findings, mothers who underestimated their low self-efficacy children's alcohol use did not spend substantially more time with them relative to other children in the sample.

We also explored the viability of an accuracy interpretation of our findings by examining the extent to which mothers based their beliefs about their children's alcohol use on background variables related to adolescent alcohol use that we did control for in the analyses. According to an accuracy interpretation, the reason that mother belief underestimates predicted the subsequent alcohol use of low self-efficacy children most strongly is because their beliefs were particularly accurate. To examine whether this was the case in our data, we examined whether the favorable beliefs that mothers held about their low self-efficacy children were more accurate than the favorable beliefs that mothers held about their high self-efficacy children. Specifically, we averaged mother belief underestimates separately for low and high self-efficacy children. Lesser values correspond to more accurate beliefs because they more closely match the alcohol use predicted by the measured background variables. The resulting values indicated that the value of the *low self-efficacy-mother belief underestimate* combination ($M = 1.01$) was not meaningfully different from the value of the *high self-efficacy-mother belief underestimate* combination ($M = 1.03$). This pattern does not support an accuracy interpretation of the data because it suggests that if a valid background variable had been omitted from the model, then mothers who underestimated their low self-efficacy children's alcohol use would not have been any more likely to rely on that predictor when forming their beliefs than mothers who underestimated their high self-efficacy children's alcohol use.

Based on the convergence of our findings with those from the experimental literature, coupled with the strong set of background variables related to adolescent alcohol use included in the analytic models and the pattern of accuracy and inaccuracy of mothers' beliefs, we conclude that the self-fulfilling prophecy interpretation is the more plausible explanation for the current findings.

In Search of the Powerful Self-Fulfilling Prophecy

Although the self-fulfilling prophecy has traditionally been thought to be a powerful phenomenon (see Jussim et al., 1996), naturalistic studies performed over the past two decades have converged on the conclusion that self-fulfilling prophecies have only modest effects on targets' outcomes (Jussim & Harber, 2005). However, because these effects represent averages, researchers have increasingly explored potential moderators of the process to identify when and for whom self-fulfilling prophecy effects may be particularly influential (e.g., Jussim et al., 1996; Madon et al., 1997, 2003, 2004; Madon, Smith, et al., 2001; Smith et al., 1998). In this research we continued in search of powerful self-fulfilling prophecy effects by examining whether children's self-efficacy to refuse alcohol from peers interacted with the favorableness of mothers' beliefs to influence the strength of mothers' self-fulfilling effects.

Results supported the conclusion that mothers had stronger self-fulfilling effects on their children's subsequent alcohol use when children's self-efficacy was low and mothers' inaccurate beliefs were

favorable. For example, in terms of standardized coefficients, the self-fulfilling effect of mothers' beliefs on their low self-efficacy children's subsequent alcohol use was virtually zero for unfavorable beliefs and was as strong as 0.2 for favorable beliefs. Although this upper value is still within the range of effects typically found in a variety of naturalistic contexts, it is substantially higher than the average self-fulfilling effect that mothers have on their children's alcohol use (see Madon et al., 2003, 2004). Thus, the findings of this research lend additional support to the idea that self-fulfilling prophecy effects can be relatively powerful under some conditions and among certain targets.

Recent critiques of self-esteem research have questioned whether self-views are valid predictors of important outcomes. For example, Baumeister and his colleagues (Baumeister, Campbell, Krueger, & Vohs, 2003) argued that boosting self-esteem has not prevented children from engaging in delinquent behaviors such as smoking or drinking. However, other researchers have suggested that broadening the conceptualization of self-esteem to include more specific aspects of self-views may increase the predictive utility of such measures. For example, Swann et al. (2007) suggest that matching the predictor and outcome variables in terms of specificity may minimize the influence of other predictors on a given relation and, therefore, clarify the influence of specific self-views on important outcomes. Our own research on moderators of self-fulfilling prophecy effects is relevant to this debate in that measures of self-esteem and self-efficacy had differential influences on the relation between mothers' beliefs and children's alcohol use. Our past work showed that global self-esteem did not moderate children's susceptibility to negative and positive self-fulfilling prophecy effects (Madon et al., 2003), whereas the current study showed that children's self-efficacy to refuse alcohol from peers – which is a more specific measure of children's self-views – did. Furthermore, children's self-efficacy remained a significant moderator regardless of whether or not children's global self-esteem was included in the analyses. Thus, our findings lend support to the idea that self-views do predict important outcomes, especially when their specificity matches the specificity of the outcome in question.

Research Implications

The tendency for low self-efficacy children to confirm their mothers' favorable beliefs more than their mothers' unfavorable beliefs is consistent with the idea that children who are at greater risk for negative outcomes are particularly susceptible to, and benefit the most from, positive self-fulfilling prophecy effects. This finding is important in terms of both theory and practice. From a theoretical standpoint the finding is important because it touches on one of the dominant themes in the self-fulfilling prophecy literature: that self-fulfilling prophecy effects contribute to social problems by disproportionately harming targets who are at risk for negative outcomes (e.g., Klein & Snyder, 2003; Merton, 1948; Rosenthal & Jacobson, 1968). In contrast to this idea, however, the present study found that positive self-fulfilling prophecies were more powerful than negative ones among children who were at greater risk for adolescent alcohol use. Thus, the findings of our research suggest that targets who are at risk for negative outcomes may sometimes benefit the most from positive self-fulfilling prophecy effects.

Of course, just because the low self-efficacy children in our research were more susceptible to their mothers' positive than negative self-fulfilling effects does not mean all targets who are at risk for negative outcomes will show the same pattern. Whereas the mothers in our sample sometimes held favorable beliefs about their low self-efficacy children despite their children's greater risk for adolescent alcohol use, perceivers in other kinds of social relationships may not generally hold favorable beliefs about at-risk targets. For example, even though research indicates that some stereotypes have become more favorable over time (i.e., stereotypes about African Americans, Chinese, Japanese, Turks, Irish, Jews, and Italians; Madon, Guyll et al., 2001, Study 3), it is still the

case that perceivers may typically hold unfavorable beliefs about at-risk targets far more often than favorable beliefs. Accordingly, at-risk targets may be disproportionately exposed to unfavorable beliefs, thereby limiting their opportunities to benefit from positive self-fulfilling prophecy effects.

The findings of this research also have practical implications for alcohol use among youth. They indicate that despite the increasing influence of peers during adolescent development, parents can continue to have important and beneficial socializing influences on their children's alcohol use (Catalano & Hawkins, 1996). Moreover, they suggest that mothers' global parenting and children's perceptions of their friend's alcohol use mediated mothers' self-fulfilling effects on their children's subsequent alcohol use and that these behavioral mediators contributed to the greater power of positive self-fulfilling prophecies among low self-efficacy children.

The identification of these behavioral mediators is important for several reasons. First, although previous research has examined behavioral mediators of the self-fulfilling prophecy process (Harris & Rosenthal, 1985), none to our knowledge have examined behavioral mediators in the context of the family despite the fact that the family unit is of central importance to youth and their successful development. Second, the behavioral mediators that we identified support Harris' (1993) hypothesis that parents' inaccurate beliefs are communicated to children through their parenting behaviors.

Third, our measure of global parenting, which mediated mothers' self-fulfilling effects, included some of the factors shown by prior research to shape children's self-efficacy, including parental monitoring and the affective quality of the parent-child relationship (Boyd et al., 2006; Watkins et al., 2006). Consistent with those prior findings, our data also showed a significant correlation between mothers' global parenting and children's self-efficacy (Table 1), thereby raising the possibility that some of the factors that shape children's self-efficacy, such as parenting, may also mediate mothers' self-fulfilling effects on their children's alcohol use. Further exploration of these potential interconnections remains an important area for future research to address.

Fourth, our data suggest that mothers' inaccurate beliefs may have initiated a chain of events that ultimately served to buffer low self-efficacy children from increased alcohol use. For example, the favorable beliefs that some mothers held about their children might have initiated changes in their global parenting and in their children's perceptions of their friend's alcohol use. Because of these changes, mothers' favorable beliefs may have interfered with a negative trajectory that would have otherwise led to greater drinking among low self-efficacy children. In this way, mothers' favorable beliefs may have exerted a protective influence in the prevention of adolescent alcohol use among low self-efficacy children (Rutter, 1990). Mothers' favorable beliefs may not have had the same effect on the alcohol use of high self-efficacy children's alcohol use because these children were already at lower risk and thus not vulnerable to the same environmental and situational risks as were low self-efficacy children. The possibility that mothers' favorable beliefs might act as a protective factor in the reduction of alcohol use among at-risk youth is particularly important given that children who initiate substance use at a young age are at increased risk for violent behavior, serious bodily injury, early sexual activity, and substance abuse and dependence (Hawkins et al., 1992), outcomes that can produce considerable costs to society (Spath, Gyll, & Day, 2002).

These findings suggest that perceivers' favorable beliefs can have particularly beneficial effects on children who are at risk for negative outcomes; however, it is also the case that not all social relationships may be conducive to such effects. One way to increase the chance that at-risk children will benefit from perceivers' positive self-fulfilling effects is by instituting policy changes that encourage perceivers (e.g., day care providers, head start and elementary school teachers) to hold realistic, but favorable beliefs about the children with whom they interact (Eden, 1986). Our research suggests that under these conditions children who are at risk for negative outcomes could benefit considerably from the self-fulfilling effects of perceivers' favorable beliefs.

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REFERENCES

- Aroian, L. A. (1944). The probability function of the product of two normally distributed variables. *Annals of Mathematical Statistics*, 18, 265–271.
- Babad, E. Y., Inbar, J., & Rosenthal, R. (1982). Pygmalion, Galatea, and the Golem: Investigations of biased and unbiased teachers. *Journal of Educational Psychology*, 71, 459–474.
- Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall, Inc.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W. H. Freeman.
- Bandura, A., & Locke, E. A. (2003). Negative self-efficacy and goal effects revisited. *Journal of Applied Psychology*, 88, 87–99.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Society Psychology*, 51, 1173–1182.
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological Science in the Public Interest*, 4, 1–44.
- Botvin, G. (2000). *Life skills training*. Princeton, NJ: Princeton Health Press.
- Boyd, K., Ashcraft, A., & Belgrave, F. Z. (2006). The impact of mother–daughter and father–daughter relationships on drug refusal self-efficacy among African American adolescent girls in urban communities. *Journal of Black Psychology*, 32, 29–42.
- Bryk, A. S., Raudenbush, S. W., & Congdon, R. T. (1996). *HLM: Hierarchical linear and nonlinear modeling with the HLM/2L and HLM/3L programs*. Chicago: Scientific Software International.
- Burisch, M. (1997). Test length and validity revisited. *European Journal of Personality*, 11, 303–315.
- Caprara, G. V., Regalia, C., & Bandura, A. (2002). Longitudinal impact of perceived self-regulatory efficacy on violent conduct. *European Psychologist*, 7, 63–69.
- Caprara, G. V., Scabini, E., Barbaranelli, C., Pastorelli, C., Regalia, C., & Bandura, A. (1998). Impact of adolescents' perceived self-regulatory efficacy on familial communication and antisocial conduct. *European Psychologist*, 3, 125–132.
- Catalano, R. F., & Hawkins, J. D. (1996). The social development model: A theory of antisocial behavior. In J. D. Hawkins (Ed.), *Delinquency and crime: Current theories* (pp. 149–197). New York: Cambridge University Press.
- Cochran, W. G. (1977). *Sampling techniques* (3rd ed.). New York: Wiley.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Erlbaum.
- Eden, D. (1986). OD and self-fulfilling prophecy: Boosting productivity by raising expectations. *Journal of Applied Behavioral Science*, 22, 1–13.
- Harris, M. J. (1993). Issues in studying the mediation of expectancy effects: A taxonomy of expectancy situations. In P. D. Blanck (Ed.), *Interpersonal expectations: Theory, research, and applications* (pp. 350–378). London: Cambridge University Press.
- Harris, M. J., & Rosenthal, R. (1985). Mediation of interpersonal expectancy effects: 31 meta-analyses. *Psychological Bulletin*, 97, 363–386.
- Harter, S. (1993). Causes and consequences of low self-esteem in children and adolescents. In R. F. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp. 87–116). New York: Plenum.

- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*, *112*, 64–105.
- Judd, C. M., & McClelland, G. H. (1989). *Data analysis: A model-comparison approach*. Orlando, FL: Harcourt Brace Jovanovich.
- Jussim, L. (1989). Teacher expectations: Self-fulfilling prophecies, perceptual biases, and accuracy. *Journal of Personality and Social Psychology*, *57*, 469–480.
- Jussim, L. (1991). Social perception and social reality: A reflection-construction model. *Psychological Review*, *98*, 54–73.
- Jussim, L., & Eccles, J. (1992). Teacher expectations II: Construction and reflection of student achievement. *Journal of Personality and Social Psychology*, *63*, 947–961.
- Jussim, L., & Eccles, J. (1995). Naturally occurring interpersonal expectancies. *Review of Personality and Social Psychology*, *15*, 74–108.
- Jussim, L., Eccles, J., & Madon, S. (1996). Social perception, social stereotypes, and teacher expectations: Accuracy and the quest for the powerful self-fulfilling prophecy. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 28, pp. 281–388). San Diego, CA: Academic Press.
- Jussim, L., & Harber, K. D. (2005). Teacher expectations and self-fulfilling prophecies: Knowns and unknowns, resolved and unresolved controversies. *Personality and Social Psychology Review*, *9*, 131–155.
- Klein, O., & Snyder, M. (2003). Stereotypes and behavioral confirmation: From interpersonal to intergroup perspectives. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 35, pp. 153–234). San Diego, CA: Academic Press.
- Kreft, I., & de Leeuw, J. (1998). *Introducing multilevel modeling*. Thousand Oaks, CA: Sage.
- Li, C., Pentz, M. A., & Chou, C. (2002). Parental substance use as a modifier of adolescent substance use risk. *Addiction*, *97*, 1537–1550.
- Madon, S., Guyll, M., Aboufadel, K., Montiel, E., Smith, A., Palumbo, P., & Jussim, J. (2001). Ethnic and national stereotypes: The Princeton trilogy revisited and revised. *Personality and Social Psychology Bulletin*, *27*, 996–1010.
- Madon, S., Guyll, M., Spoth, R. L., Cross, S. E., & Hilbert, S. J. (2003). The self-fulfilling influence of mother expectations on children's underage drinking. *Journal of Personality and Social Psychology*, *84*, 1188–1205.
- Madon, S., Guyll, M., Spoth, R., & Willard, J. (2004). Self-fulfilling prophecies: The synergistic accumulation effect of parents' beliefs on children's drinking behavior. *Psychological Science*, *15*, 837–845.
- Madon, S., Jussim, L., & Eccles, J. (1997). In search of the powerful self-fulfilling prophecy. *Journal of Personality and Social Psychology*, *72*, 791–809.
- Madon, S., Smith, A., Jussim, L., Russell, D., Walkiewicz, M., Eccles, J., & Palumbo, P. (2001). Am I as you see me or do you see me as I am? Self-fulfilling prophecies and self-verification. *Personality and Social Psychology Bulletin*, *27*, 1214–1224.
- Madon, S., Willard, J., Guyll, M., Trudeau, L., & Spoth, R. (2006). The long-term self-fulfilling influence of mothers' beliefs on children's alcohol use. *Journal of Personality and Social Psychology*, *90*, 911–926.
- Merton, R. K. (1948). The self-fulfilling prophecy. *Antioch Review*, *8*, 193–210.
- Molgaard, V., Kumpfer, K., & Fleming, B. (1997). *The strengthening families program: For parents and youth 10–14*. Ames, IA: Iowa State University Extension.
- Nash, S. G., McQueen, A., & Bray, J. H. (2005). Pathways to adolescent alcohol use: Family environment, peer influence, and parental expectations. *Journal of Adolescent Health*, *37*, 19–28.
- Preacher, K. J., & Hayes, A. F. (in press). Mediation and the estimation of indirect effects in communication research. To appear in A. F. Hayes, M. D. Slater, & L. A. Snyder (Eds.), *The Sage guide to advanced data analysis methods for communication research*. Thousand Oaks, CA: Sage.
- Preacher, K. J., Rucker, D. D., & Hayes, A. F. (in press). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research*.
- Reid, J. B. (1991). Mediational screening as a model for prevention research. *American Journal of Community Psychology*, *19*, 867–872.
- Rosenthal, R., & Jacobson, L. (1968). Teacher expectations for the disadvantaged. *Scientific American*, *218*, 19–23.
- Rosenthal, R., & Rubin, D. B. (1978). Interpersonal expectancy effects: The first 345 studies. *The Behavioral and Brain Sciences*, *3*, 377–386.
- Rutter, M. (1990). Psychosocial resilience and protective mechanisms. In J. E. Rolf, A. S. Masten, D. Cicchetti, K. H. Neuchterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 181–214). New York, NY: Cambridge University Press.

- Smith, A., Jussim, L., Eccles, J., VanNoy, M., Madon, S., & Palumbo, P. (1998). Self-fulfilling prophecies, perceptual biases and accuracy at the individual and group level. *Journal of Experimental Social Psychology, 34*, 530–561.
- Snijders, A. B., & Bosker, R. J. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling*. Thousand Oaks, CA: Sage.
- Snyder, M. (1984). When belief creates reality. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 18, pp. 247–305). San Diego, CA: Academic Press.
- Snyder, M. (1992). Motivational foundations of behavioral confirmation. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 25, pp. 67–114). San Diego, CA: Academic Press.
- Snyder, M., & Stukas, A. A. Jr. (1999). Interpersonal processes: The interplay of cognitive, motivational, and behavioral activities in social interaction. *Annual Review of Psychology, 50*, 273–303.
- Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. In S. Leinhardt (Ed.), *Sociological methodology* (pp. 290–312). Washington, DC: American Sociological Association.
- Spoth, R. (1997). Challenges in defining and developing the field of rural mental disorder preventative intervention research. *American Journal of Community Psychology, 25*, 425–448.
- Spoth, R. L., Gyll, M., & Day, S. X. (2002). Universal family-focused interventions in alcohol-use disorder prevention: Cost-effectiveness and cost-benefit analyses of two interventions. *Journal of Alcohol Studies, 63*, 219–228.
- Spoth, R., Randall, G. K., Shin, C., & Redmond, C. (2005). Randomized study of combined universal family and school preventive interventions: Patterns of long-term effects on initiation, regular use, and weekly drunkenness. *Psychology of Addictive Behaviors, 19*, 372–381.
- Spoth, R. L., Redmond, C., Trudeau, L., & Shin, C. (2002). Longitudinal substance initiation outcomes for a universal preventive intervention combining family and school programs. *Psychology of Addictive Behaviors, 16*, 129–134.
- Sutherland, A., & Goldschmid, M. L. (1974). Negative teacher expectation and IQ change in children with superior intellectual potential. *Child Development, 45*, 853–856.
- Swann, W. B., Jr., Chang-Schneider, C., & McClarty, K. L. (2007). Do people's self-views matter? Self-concepts and self-esteem in everyday life. *American Psychologist, 62*, 84–94.
- Swann, W. B., Jr., Pelham, B. W., & Krull, D. S. (1989). Agreeable fancy or disagreeable truth? Reconciling self-enhancement and self-verification. *Journal of Personality and Social Psychology, 57*, 782–791.
- Watkins, J. A., Howard-Barr, E. M., Moore, M. J., & Werch, C. C. (2006). The mediating role adolescents self-efficacy in the relationship between parental practices and adolescent alcohol use. *Journal of Adolescent Health, 38*, 448–450.