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The Effect of Subjective Normative Social Images of Smokers on Children's Intentions to Smoke

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Abstract

This paper expands the literature on peers' influence on youth's behaviors through the examination of the effect of subjective normative social images of smokers (perceived peers' social images of smokers) on subsequent intentions to smoke and the relation between subjective normative social images and the youth's own social images, or prototypes. Data are from the two oldest cohorts (fourth and fifth graders at the first assessment) and from the first five assessments of the Oregon Youth Substance Use Project, an ongoing longitudinal study. Results showed that both children's subjective normative social images and prototypes uniquely predicted intentions to smoke cigarettes at the subsequent assessment. Across time, subjective normative social images were more positive than the youth's own prototypes, and subjective normative social images and children's own prototypes were reciprocally related over time. Results provide support for subjective normative social images as a risk factor for children's smoking and suggest targeting this mechanism in smoking prevention programs for children.

Keywords

Peer influences; Subjective normative social images; Smoking; Children

Children and adolescents are highly susceptible to peer influence (Gifford-Smith, Dodge, Dishion, & McCord, 2005). Since smoking in adolescence often occurs within the context of a peer group, with or without peer pressure (Friedman, Lichtenstein, & Biglan, 1985), peer influence has been conceptualized as a central etiological mechanism in smoking initiation in adolescence (Chuang, Ennett, Bauman, & Foshee, 2005; Urberg, Luo, Pilgrim, & Degirmencioglu, 2003; Urberg, Degirmencioglu, & Pilgrim, 1997). The adolescent literature has consistently shown similarity in substance use between peers (e.g., Ennett & Bauman, 1991, 1994; Urberg, Degirmencioglu, & Pilgrim, 1997), attributed to both socialization by peers (Andrews, Tildesley, Hops, & Li, 2002; Ennett & Bauman, 1994; Schulenberg et al., 1999; Wills & Cleary, 1999) and selection of peers who are similar to them (Ennett & Bauman, 1994; Fisher & Bauman, 1988).

Central to peer influence is the effect of children's beliefs about their peers on the child's behavior. In addition to peers' use, children's and adolescents' beliefs about the prevalence of

smoking among their peers (i.e., normative beliefs or subjective norms) is an important etiological mechanism predicting their intentions to smoke in the future and their subsequent initiation of tobacco use (Gritz et al., 2003; Ianotti & Bush, 1992; Simons-Morton, Chen, Abrams & Haynie, 2004). Within the Theory of Reasoned Action (TRA; Fishbein & Ajzen, 1975) and the Theory of Planned Behavior (TPB; Ajzen, 1988; 1991) normative beliefs are hypothesized to influence intentions to engage in a behavior. Descriptive norms, or the extent to which children believe that their peers have tried the behavior, have often been used to assess the effect of normative beliefs on intentions. Descriptive norms or perceived use has often been a stronger predictor than peers' actual use (Ianotti & Bush, 1992; Kandel, 1996) and has mediated the effect of the peer's actual behavior on the adolescent's behavior (Fromme & Ruela, 1994; Prinstein & Wang, 2005).

Another central etiological mechanism related to initiation of smoking is the adolescent's social image of smokers. Within Gibbons and Gerrard's Prototype/Willingness Model (Gibbons & Gerrard, 1995, 1997; Gibbons et al., 2004), a desirable "prototype" (i.e., a desirable social image) of a person engaging in an activity predicts willingness to engage in the behavior, which, in turn is related to subsequent engagement in the activity. For example, if an individual perceives the type of person who smokes as exciting or cool, then they are more willing to smoke themselves. In several studies, favorable images of smoking and smokers are associated with greater intentions to smoke among children and adolescents (Andrews & Peterson, 2006; Chassin, et al., 1981; Dinh, Sarason, Peterson, & Onstad, 1995; Norman & Tedeschi, 1989; Spijkerman, van den Eijden, Vitale, & Engels, 2002) and subsequent initiation or escalation in smoking (Andrews, Hampson, Barckley, Gerrard, & Gibbons, in press; Norman & Tedeschi, 1989).

Adolescents' beliefs about their peers (e.g., normative beliefs; subjective norms) extend beyond their beliefs about peers' behaviors to beliefs about peers' social images or prototypes of smokers. We have termed these beliefs, "subjective normative social images", since similar to the conceptualization of subjective norms as beliefs about peers' normative behavior; these are beliefs about peers' social images of smokers. Subjective normative social images may provide another mechanism by which children are influenced by their peers. The broad goal of the study reported here was to examine whether children are influenced by what they perceive as peers' prototypes or social images of cigarette smokers, and if this influence extends beyond their own prototypes of smokers. To accomplish this goal, we predicted intentions to smoke at the subsequent assessment from subjective normative social images, while controlling for prototypes. The criterion of intentions was chosen because intentions are more prevalent than use among children and because intentions theoretically precede use. Pierce, Choi, Gilpin, Farkas, and Merrit (1996) conceptualized intentions as the first step in the acquisition of smoking and several studies have supported this contention. For example, Andrews, Tildesley, Hops, Duncan and Severson (2003) showed that intentions in the 1st through 5th grade were related to smoking initiation two years later.

If our hypothesis was supported and if subjective normative social images uniquely predicted intentions to smoke, it was important to describe the development of subjective normative social images over time and to understand the relation of these subjective normative social images to prototypes. To accomplish these goals, we constructed individual growth curves for both subjective normative social images and prototypes between the 4th and 10th grade, and examined the relation of these growth curves over time, by comparing the level and change across time between these two constructs. We hypothesized that subjective normative social images would be more positive than adolescents' own prototypes across the developmental period and that subjective normative social images would grow more rapidly than prototypes. This hypothesis is based on the literature regarding the relation between subjective norms and peers' actual use. Children often overestimate the smoking behavior of their peers (Agostinelli

& Grube, 2005; Graham, Marks, & Hansen, 1991), hence we expected that they would also overestimate the positive prototypes of their peers, resulting in a higher average level of favorable subjective normative social images as compared to prototypes.

We also tested the reciprocal relation between subjective normative social images and prototypes over time. The social psychological literature regarding the powerful influence of the group (e.g., Eiser, 1980) and social learning theory (Bandura, 1977), which proposes that individuals strive to emulate the attitudes of others, both provide support for the prediction of participant's prototypes from subjective normative social images. Conversely, social projection (Ross, Greene, & House, 1977), or the projection of one's own behavior or beliefs on others, provides support for the prediction of subjective normative social images from the participants' own prototypes. Thus we hypothesized a reciprocal relation between subjective normative social images and prototypes over time.

The availability of longitudinal data from the Oregon Youth Substance Use Project (OYSUP; Andrews, et al., 2003; Hampson, Andrews, & Barckley, 2007; Andrews & Peterson, 2006) allowed us to investigate these hypotheses across a developmental period, from the 4th through the 10th grade. OYSUP is an ongoing cohort-sequential longitudinal study, following over 1000 children for nine years starting when children were in the 1st through 5th grade, to identify the predictors of children's and adolescent's substance use (Andrews et al., 2003). Results of previous studies with this data set showed that boys were more likely than girls to intend to use tobacco and drink alcohol when older (Andrews et al., 2003), that girls had more positive prototypes than did boys (Andrews & Peterson, 2006), and a stronger relation between early prototypes and subsequent smoking for girls than boys (Andrews, et al., in press) justifying the inclusion of gender as a moderating variable in all hypotheses.

Method

Overview of Design

This paper examined data from the first five assessments of an ongoing study of risk factors associated with children's and adolescent's substance use, the Oregon Youth Substance Use Project (OYSUP). This study uses a cohort-sequential design (Schaie, 1965; 1970) wherein five grade cohorts (1st through 5th grade at T1, the 1998 – 1999 school year) were assessed across six years (four annual assessments, following by an additional assessment, T5, at Year 6). Since the measure of subjective normative social images was not attained until the children were in the 4th grade, analyses are based on those who were in the 4th and 5th grade at T1, following them until the fifth assessment, and collapsing across cohorts on all 4th through 10th graders, with 828 4th graders (mean age = 9.98; SD = .38), 831 5th graders (mean age = 10.97, SD = .37), 789 6th graders (mean age = 12.05, SD = .39), 595 7th graders (mean age = 13.08, SD = .36), 380 8th graders (mean age = 14.11, SD = .38), 189 9th graders (mean age = 15.35, SD = .34) and 162 10th graders (mean age = 16.35, SD = .33). Since grade is a strong predictor of prevalence of use (Andrews, et al. 2003), children are grouped according to their current grade. If children were held back a grade (e.g., in Grade 4 at both T1 and T2; $n = 4$), only the first assessment of that child in the given grade was used. As shown in Andrews, et al. (2003), differences between cohorts are minimal.

Participants

Participants at T1—Of the 1075 students for whom we obtained parental consent, 1070 children completed the first assessment (T1). An average of 215 students per grade (1st through 5th; with 417 children in the 4th and 5th grade) participated in the study at T1, with an equal proportion of girls (50.3%, $N = 538$) as boys. With minor exceptions, the adolescents in the T1 sample were representative of elementary students in the district, specifically, and in

Oregon, in general. (The reader is referred to Andrews, et al. 2003, for more details regarding the characteristics of the sample and the design of the study). At the time of the T1 assessment, participants averaged 9.0 years of age ($SD = 1.45$), 71% of mothers and 66% of fathers had more than a high school education and 7% of mothers and 11% of fathers had not graduated from high school. The sample was primarily Caucasian (85.8%), with 7.1% Hispanic, 1.1% African-American, 2.2% Asian, 2.4% American Indian or Alaskan Native, and 1.7% other or of mixed race/ethnicity. Forty percent of the sample was eligible for a free or reduced lunch under Title 1, an indicator of low family income.

Attrition—Of the 1075 children in the OYSUP sample, 160 did not participate in the T5 assessment (15.0% of the total sample). Among the 417 children who were in the fourth and fifth grade at T1, 66 (15.8%) did not participate in the T5 assessment. Attrition between two sequential assessments was highest between the fourth and fifth assessment, (10%, 10.1% for the oldest two cohorts), which were separated by two years. Children who participated in the study at T5 were similar to those in the T1 sample who did not participate at T5 on demographic variables, including grade, gender, race/ethnicity, income (as measured by eligibility for free lunch). They also were not different on prototypes, on subjective normative social images of cigarette users at T1, or on their intention to smoke cigarettes at T1.

Assessment Procedures

At T1, students were assessed at their school during the school day. At T2 through T5, the assessment location varied depending upon where the child lived. If the child lived outside the district but within driving range (within 40 miles) of the Oregon Research Institute, they were assessed at the institute. If they did not live within driving range, 4th through 8th graders were assessed via the telephone and 9th and 10th graders completed mailed questionnaires.

For in-school assessments, all children completed a written questionnaire in group sessions. A trained monitor read the questions aloud to 4th and 5th graders; for 6th through 10th graders, children read the questions to themselves and monitors were available to answer questions. If children in the 6th through 10th grade could not read the questionnaire to themselves, a monitor read it to them. At the institute, assessments were done either in groups or individually, depending on scheduling considerations. All assessments were done in the in the school year, beginning in late winter.

Measures

Characteristics of substance users for the assessment of prototypes and subjective normative social images were selected from a list of attributes of smokers that Dinh and colleagues (1995) derived from a content analysis of tobacco advertisements. Dinh prospectively examined the relation between 5th and 7th grade attributes and 9th grade use. Three attributes were selected from the Dinh study that: a) were endorsed more frequently, b) discriminated between those who smoked weekly in 9th grade and those who did not, and c) changed as a function of the child's age. Attributes selected for the present study were "exciting", "cool or neat", and "popular". To assess prototypes, all children were asked to indicate "what you think about kids who smoke" and then to assess subjective normative social images, "what your friends think about kids who smoke" using the following items: "Kids who smoke cigarettes are cool or neat/exciting, popular/liked by other kids". A three- point response format was used for each question, with "Yes" coded as 2, "No" as 0, and "Maybe" as 1. As shown in Andrews and Peterson (2006), the Guttman properties of these items were excellent, implying a unidimensional scale, with children progressing developmentally from describing kids who smoke as "popular" to describing kids who smoke as both "popular" and "exciting" and finally to attributing all three images to smokers. Cronbach's alpha of these items for the measure of prototypes and subjective normative social images of cigarette users was .60 and .77,

respectively. The three items were summed to measure prototypes and subjective normative social images of cigarette users. At T1, among 4th and 5th graders, 80.6% of the sample had a score of zero on prototypes (i.e., all three prototypes were not endorsed); 70.1% had a score of zero on subjective normative social images. At T5, among 9th and 10th graders, 72.6% of the sample had a score of zero on prototypes and 68.1% had a score of zero on subjective normative social images.

To assess intention to use cigarettes in the future, all children were asked: “Do you think you would smoke when you are grown-up?” and “Do you think you would smoke when you are a teenager”, for 4th through 6th graders, “in high school” for 7th and 8th graders or “out of high school”, for 9th and 10th graders. A three- point response format was used for each question, with “Yes” coded as 2, “No” as 0, and “maybe” as 1. Collapsing across grades, the correlation between the two intention items was .61, with an alpha of .75. The two items were summed to measure intention. In earlier studies (Andrews & Peterson, 2006; Andrews et al., 2003) the intraclass correlation of the variables within school were examined and found to be small, ranging from .001 to .018. At T1, among 4th and 5th graders, 81.5% had no intention to smoke cigarettes in the future and at T5, among 9th and 10th graders, 75.4% had no intention to smoke cigarettes in the future.

Results

Predicting Change in Intentions

We used Generalized Estimating Equations (GEE; Liang & Zeger, 1986; Zeger & Liang, 1986), with an autoregressive lagged model, to predict change in intentions at the subsequent assessment from both subjective normative social images and prototypes, measured at the previous assessment. For these analyses, the sample was restricted to those who were in the fourth or fifth grade at T1, since subjective normative social images were only measured when children reached the fourth grade. GEE extends the generalized linear model (GLM) framework of McCullagh and Nelder (1983) to handle correlated observations, such as those arising from repeated measures over time on a sample of independent individuals. Because we were interested in controlling for changes in intentions due to time, linear and quadratic effects were estimated. If the quadratic effect was significant, it remained in the model. The model included indicators of the participants’ socioeconomic status, mother’s education and participation in the free/reduced lunch program, and grade as control variables, and the gender of the participant, the participant’s prototypes and subjective normative social images and the interaction of gender with these latter two variables as predictors. Non-significant interactions with gender were removed using backwards elimination (Cohen & Cohen, 1983). Significant interactions with gender were interpreted using the techniques recommended by Aiken and West (1991).

The interaction of subjective normative social images with gender was non-significant ($\beta = .045$, $Z = 1.00$; ns) and therefore was removed from the model. As shown in Table 1, despite the high correlation between prototypes and subjective normative social image across all assessments (range - .48 - .74, mean = .63), both subjective normative social images and the interaction of gender with prototypes uniquely and significantly predicted subsequent change in intention to smoke cigarettes. Decomposition of the gender by prototypes interaction showed that favorable prototypes positively predicted intentions for girls, but negatively predicted intentions for boys ($\beta = -.14$, $Z = 3.46$, $p < .001$). The results of this analysis suggest that although subjective normative social images are related to prototypes they are a unique predictor of intentions, and thus have etiological significance. This finding justified an exploration of the developmental pattern of subjective normative social images as the child ages and further exploration of the relation of subjective normative social images to prototypes.

Examining the Growth of Subjective Normative Social Images and Prototypes over Time

We used cohort sequential Latent Growth Modeling (LGM) to examine the growth of prototypes and subjective normative social images from the fourth through the tenth grade and to test the difference between the two growth curves. In LGM, measures of variables across time (assessments) are used to estimate the intercept or level and the slope, or rate of change, over time. In Cohort-Sequential LGM, data are collapsed across cohort and estimates of intercept and slope are based on measures of variables for each grade. The child's grade rather than age was used as an indicator of development, since the variables in the model are strongly influenced by the child's contextual environment, including their grade in school (Andrews & Peterson, 2005). We used the M-Plus program, version 3.0 (Muthen & Muthen, 1998) to conduct analyses. Within this program, missing data are estimated using maximum likelihood estimates, yielding an effective sample size of 1046 for the analyses. To test for gender differences on each parameter, we used multiple sample analysis to evaluate the significance of the difference in fit between the two models, one with the respective parameter fixed between genders and the other with the parameter freed. The growth curves of both prototypes and subjective normative social images are shown in Figure 1.

For prototypes of cigarette users, a growth curve with both a linear and a quadratic component fit the data well (O^2 (16, $n = 1045$) = 31.06, $p < .05$; CFI = .91, Root Mean Square Error of Approximation (RMSEA) = .030) and the addition of the quadratic component significantly improved the fit of the model (O^2 difference (4, $n = 1045$) = 12.67, $p < .05$). The means and variances of the intercepts and linear and quadratic components of each latent growth curve are shown in Table 2. For prototypes, the linear slope was positive and significant, and the quadratic component was not significant. Thus, social images become more favorable as a function of the child's grade. Variances of all parameter estimates were significant. Multiple sample analysis suggested a gender difference in the variance of the intercept (O^2 difference (1, $n = 1045$) = 10.72, $p < .01$) such that males had a significantly higher variance (.32) than females (.12), although both were significant. Analyses suggested no other significant gender differences in the mean or variance of parameter estimates or in the correlations between estimates.

For subjective normative social images of cigarette users, a growth curve with both a linear and a quadratic component fit the data well (O^2 (16, $n = 1045$) = 36.67, $p < .01$; CFI = .91; RMSE = .03) and the addition of the quadratic component significantly improved the fit of the model (O^2 difference (4, $n = 1045$) = 32.54, $p < .01$). As shown in Table 2, both the linear slope and the quadratic component were significant. The quadratic component was negative suggesting that while subjective normative social images became more favorable as a function of grade, the rate of change in subjective normative social images was slower in the later years. The variances of the parameter estimates were not significant ($p < .30$). Multiple sample analysis suggested a significant gender difference in the variance of the intercept (O^2 difference (1, $n = 1045$) = 6.72, $p < .05$), in that the variance for males (.29; $p < .05$) was greater than for females (.00; ns). Analyses suggested no other significant gender differences in the mean or variance of parameter estimates or in the correlations between estimates.

Examining the Differences between Subjective Normative Social Images and Prototypes

Using LGM, in a procedure similar to multiple sample analysis, we examined if there was a significant difference between subjective normative social images and prototypes in means of the quadratic component, the linear slope, and the level at each grade. To do this, we constrained the means of the three parameters in the latent growth curve to be equal, and then freed each sequentially, testing the difference in fit between a constrained and free parameter estimate, starting with the highest order parameter (e.g., quadratic function). If there was a significant difference, that parameter would remain free. The difference between a model wherein the

three growth parameters means were constrained to be equal and a model where the quadratic function was freed was significant ($O^2_{\text{difference}}(1, n = 1046) = 46.01, p < .001$) suggesting that, as shown in Figure 1, subjective normative social images had a higher peak at Grade 8 and then dropped more at Grade 10 than did prototypes. Further analyses showed that the mean of the slope of subjective normative social images was significantly greater than the mean of the slope of prototypes ($O^2_{\text{difference}}(1, n = 1046) = 102.89, p < .001$) suggesting that subjective normative social images increased faster than did prototypes. Finally, centering the level at each grade sequentially, we tested the difference between the average level at each grade. Subjective normative social images were significantly higher than prototypes at Grade 4 ($O^2_{\text{difference}}(1, n = 1046) = 30.66, p < .01$), Grade 5 ($O^2_{\text{difference}}(1, n = 1046) = 158.36, p < .01$), Grade 6 ($O^2_{\text{difference}}(1, n = 1046) = 151.02, p < .001$), Grade 7 ($O^2_{\text{difference}}(1, n = 1046) = 136.87, p < .001$), Grade 8 ($O^2_{\text{difference}}(1, n = 1046) = 130.38, p < .01$), Grade 9 ($O^2_{\text{difference}}(1, n = 1046) = 80.14, p < .001$) and Grade 10 ($O^2_{\text{difference}}(1, n = 1046) = 20.12, p < .001$). A model including the latent growth curves for both prototypes and subjective normative social images, with all parameters freely estimated, fit the data well ($O^2(59, n = 1046) = 72.23, p = .12$; CFI = .99, RMSEA = .01). Thus, subjective normative social images had a higher initial level, and increased more rapidly than prototypes, remaining significantly higher for each grade level. Since there were no gender differences between the means of the growth parameter estimates, we did not investigate the effect of gender on the difference between prototypes and subjective normative social images.

Investigating the Reciprocal Relation between Prototypes and Subjective Normative Social Images

We used GEE, with a lagged autoregressive model, to examine the reciprocal relation between prototypes and subjective normative social images. Since an autoregressive model was used, a significant association between predictor and the subsequent criterion suggested that the predictor was related to subsequent change in the criterion across time. Grade was included as a control variable. The effects of gender and interactions of gender with both prototypes and subjective normative social images were also assessed. In the first model, subjective normative social images as the predictor were related to change in prototypes, as the criterion, in the subsequent assessment. As shown in Table 3, subjective normative social images significantly predicted change in prototypes in the subsequent year. Grade also predicted change in prototypes of smokers. In the second model, prototypes, as the predictor, were related to change in subjective normative social images, the criterion, in the subsequent assessment and prototypes significantly predicted change in social images the subsequent year. Gender was not a significant predictor and the interactions with gender were non-significant. Thus, the influence of prototypes and social images on each other is bidirectional, each influencing change in the other variable.

Discussion

Findings extended past research on peer influence by showing that subjective normative social images, or beliefs about peers' prototypes, uniquely and prospectively predict intentions across childhood. This finding extends the tenets of the Theory of Planned Behavior and Theory of Reasoned Action (Ajzen, 1988, 1991; Ajzen & Fishbein, 1973, 1980; Fishbein & Ajzen, 1975) by showing that perception of peers' social images, as well as subjective norms, influence subsequent intentions and extends the Prototype/Willingness model (Gibbons & Gerrard, 1995, 1997; Gibbons et al., 2004) by suggesting a perceived normative influence in addition to prototypes. Findings show a unique influence of subjective normative social images of smokers on intentions to smoke is an important contribution to the etiology of smoking.

The unique relation between prototypes and intentions varied unexpectedly by gender. As expected from the Prototype/Willingness model (Gibbons & Gerrard, 1995; 1997), prototypes were positively related to an increase in intentions for girls, suggesting that the more favorable the social images a girl has about smokers, the more she will increase her intentions to smoke when older. Unexpectedly, prototypes were negatively related to change in intentions for boys, suggesting that the more unfavorable boys' social images are the more likely they are to increase their intentions to smoke. Further analyses showed that this finding was not due to the collinearity between subjective normative social images and prototypes. Without subjective normative social images in the model, the relation between prototypes and subsequent change in intentions for boys remained negative. This finding is inconsistent with extensive previous research showing a positive relation between favorable prototypes and intentions for both boys and girls (Hampson et al., in press; Ravis, Sheeran, & Armitage, 2006). However, the findings from the present study suggest that, for boys, an unfavorable image of smokers may be more appealing, leading them to increase their intentions to smoke.

The finding that subjective normative social images uniquely predicted intentions warranted further investigation of the functional characteristics of this construct. As expected, we found that the relation between subjective normative social images and prototypes is reciprocal over time. Subjective normative social images are related to subsequent change in prototypes and prototypes are related to subsequent change in subjective normative social images. These findings support the peer influence literature suggesting that children might be both socialized by their peers (Pilgrim, Lao, Urberg, & Fang, 1999) and select peers that are similar to themselves (Ennett & Bauman, 1991). However, since subjective normative social images are beliefs, children may also project their own beliefs onto their peers (Ross, Greene, & House, 1977), as well as be influenced by peers' beliefs.

The growth curve analysis showed that both subjective normative social images and prototypes become more positive as a function of the child's grade, with a smaller rate of change when the child reaches high school. These variables are undoubtedly influenced by the effect of school context, including type of school (i.e., elementary, middle or high school) as well as grade in school. The finding of a reciprocal relation between subjective normative social images and prototypes serves as a potential explanation of the significant increase in these two risk factors as the child matures. Subjective normative social images were significantly more favorable than prototypes over time and became more positive over time than did prototypes. This finding suggests that there could be a greater risk associated with beliefs about subjective normative social images than prototypes as the child ages.

Since subjective normative social images are beliefs about peers, they are influenced by several factors in addition to the peers' actual beliefs. The research on adolescent's perception of peers' behavior suggests that the perception of peer behavior is often erroneous. At risk youth, in particular, tend to overestimate the actual substance use of their peers (Ross, Green, & House, 1977; Unger, Rohrbach, Howard-Pitney, Ritt-Olson, & Mourrapa, 2001; Urberg, Shyu, & Liang, 1990). The finding that subjective normative social images were consistently more favorable than prototypes over time suggests that perception of peers' beliefs about smoking may also be more favorable (i.e., overestimated) than peers' actual beliefs. The finding that prototypes are related to subsequent change in subjective normative social images over time, suggests that youth may be projecting their own beliefs on their peers. Perhaps due to demand characteristics of the assessment, they are more willing to attribute positive social images of smokers to their peers than to attribute positive images of smokers to themselves. Thus, subjective normative social images may be more reflective of their true prototypes than are their responses assessing their own prototypes.

Our findings suggest the importance of subjective normative social images not only on the etiology of smoking but also as a focus of prevention programs. Perception of peers' social images was as important as the youth's own prototypes in predicting subsequent intentions, a precursor to smoking. Components designed to correct student's perceptions of their peers' behaviors have been included in several effective substance use prevention programs, including the Alcohol Abuse Prevention Trial (Hansen & Graham, 1991) and Project TNT (Sussman, Dent, Burton, Stacy, & Flay, 1995). Findings presented here emphasize the importance of the inclusion of components targeting perceptions of peers' beliefs, as well, particularly subjective normative social images. Subjective normative social images, as well as prototypes, are most likely influenced by the context of the developing child, including parental use and attitudes, the neighborhood, their peers and the media. Further research is needed to identify precursors of subjective normative social images and moderators of their effect on intentions to smoke and subsequent initiation of tobacco use.

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Figure 1.
Development of subjective normative social images and prototypes across grade.

Table 1

Prospective Prediction of Intentions from Prototypes and Subjective Normative Social Images

Predictors	Cigarettes	
	β	Z
Grade	.01	.21
Mother's Education	-.02	-.40
Free Lunches	.08	1.45
Gender	.12	2.27*
Linear (time)	-.18	-1.98*
Quadratic	.06	3.13**
Prototype	.13	3.07**
Subjective Normative Social Images	.07	2.45*
Gender x Prototype	-.27	-5.52***

*
 $p < .05$;***
 $p < .001$

Note: Zs are based on robust standard errors

Sex is coded as 0 = Females; 1 = Males

Table 2

Means and Variances of Parameter Estimates of Individual Latent Growth Curves

	Mean	Variance
Prototypes		
Intercept	.31 ***	.20 ***
Linear component	.07 **	.11 **
Quadratic Component	- .01	.00*
Subjective Normative Social Images		
Intercept	.50 ***	.13
Linear component	.15 ***	.08
Quadratic component	- .02 **	.00

**
 $p < .01$;

 $p < .001$

Table 3
Lagged Relation between Subjective Normative Social Images and Prototypes

Criterion	Predictors	β	Z
Prototypes	Linear slope	.24	3.77***
	Quadratic	-.06	-2.96**
	Grade	.08	1.58
	Gender	.01	.15
	Subjective Normative Social Images	.14	5.59***
Subjective Normative Social Images	Linear slope	.35	4.27***
	Quadratic	-.09	-3.47***
	Grade	.10	1.33
	Gender	-.01	-.11
	Prototypes	.15	3.58***

*
 $p < .05$;

**
 $p < .01$;

 $p < .001$

Note: Zs are based on robust standard errors