

STUDY II

Shyness as a Protective Factor in the Link Between Advanced Maturity and Early Adolescent Problem Behavior

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Abstract

Advanced maturity in early adolescence has previously been linked with several problem behaviors. In this study, we examine whether shyness and gender might moderate this link. The participants were 787 early adolescents ($M_{age} = 13.73$; 401 girls and 386 boys), followed for one year. We conducted moderation analyses with shyness and gender as moderators of the links between advanced maturity and problem behaviors (drunkenness and intercourse) and between one problem behavior and another. Protective effects of shyness were found for both boys and girls. For high-risk behaviors (risky drinking behaviors and one-night stands) protective effects were found for boys. Controlling for romantic involvement did not alter the moderation effects, thus failing to support the idea that protection was due to shy youths not being drawn into advanced peer groups by romantic partners. Thus, shyness might serve as protective factor against problem behaviors in early adolescence.

Keywords: shyness, drunkenness, intercourse, high-risk behaviors, early adolescence

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Adolescents sometimes seem to be totally absorbed in the social worlds they create with their friends. These relationships play an important role in development. Socializing with friends and peers helps youths develop social skills and social perspective-taking (Gifford-Smith & Brownell, 2003). From middle childhood on, relationships with friends and peers are increasingly linked to self-definition and self-esteem (Bukowski, Gauze, Hoza, & Newcomb, 1991). For adolescents who experience shyness, however, social interactions are not always experienced positively. Shyness is defined as a propensity to feel tense, worried, or awkward during social interactions, especially with unknown individuals (Cheek, Melchior, & Carpentieri, 1986), and is often viewed as a stable trait or aspect of temperament (Buss & Plomin, 1984). Shy people are inclined to blush, feel overly embarrassed, keep in the background when faced with unknown social situations, have low self-esteem and poor social skills, and fear evaluation by others (Crozier, 1979; Pilkonis, 1977). These social fears create problems for youths who want to spend time and interact with peers, friends, and potential romantic partners.

Adolescent's relationships with peers are positive in many ways, and shy youths might miss out on their benefits; however, these same relationships are also linked to problem behaviors. Problem behaviors like alcohol drinking and sexual activity begin to emerge in early adolescence, and these activities typically revolve around peers. Especially at risk are adolescents who develop early, either physically or experientially. Early puberty is a risk factor for girls in particular, and associations with older peers and boyfriends are thought to explain why early maturing girls enter into problem behaviors like drinking and early sexual activities (Caspi & Moffitt, 1995; Stattin & Magnusson, 1990). Feeling older or more mature than one's peers, or being of advanced *subjective age*, is also linked to problem behaviors (Galambos, Kolaric, Sears, & Maggs, 1999). Theoretically, youths with advanced subjective age experience a "maturity gap," or a feeling that they are not treated as maturely as they feel, and this prompts them to engage in such adult-like behaviors as drinking and sexual activities to gain status with peers (Moffitt, 1993). Because these activities are typically done in social settings with peers, and shy youths have problems with such settings, the question arises whether advanced maturity has the same implications for shy youths as for non-shy youths.

Theoretically, there are at least two possible roles shyness might play in the development of early adolescent problem behavior. One is to reduce the likelihood that adolescents would take action in situations where they could engage in problem behaviors. This idea has previously been tested using a longitudinal sample of early-adolescent boys (Kerr, Tremblay, Pagani, & Vitaro, 1997). The authors reasoned that fear-based shyness, or behavioral inhibition, is in young children associated with long time lapses before taking action in unfamiliar settings (see (Kagan, Reznick, & Gibbons, 1989). Because delinquent acts typically take place in unfamiliar settings, they reasoned, shy boys who get into these situations might hesitate to take action. They found that even among boys who were at risk of delinquency because they were disruptive, those who

were identified by classmates as shy were less likely to be delinquent two years later. Early adolescent problem behaviors like drinking and engaging in intercourse require a certain level of fearlessness, disinhibition, or even impulsiveness, and shy people are generally less impulsive and more inhibited (Caspi & Silva, 1995). Indeed, people in general perceive shy individuals as not being impulsive (Schmidt & Tasker, 2000). Hence, the characteristics of shyness—lack of impulsivity, fearfulness, and inhibition—might be protective against participation in early adolescent problem behaviors.

Another way in which shyness might reduce the risk of engaging in problem behavior is by limiting the chance for romantic involvement. Having a steady boyfriend or girlfriend might plunge youths into more advanced behaviors, especially if an older romantic partner is involved. Older romantic partners can almost be assumed for youths who feel older than their peers. Indeed, research links advanced maturity with having older friends (Kerr, Stattin, & Kiesner, 2007) and early sexual encounters (Jessor, 1992). Early adolescents in steady relationships might automatically start to affiliate with peer groups where intercourse and drinking are normative. In all of these cases, shyness might inhibit engaging in problem behaviors in several ways. First, regarding romantic relationships, shy adolescents and adults go on fewer dates, have fewer sexual encounters, and are less likely than non-shy people to be involved in a romantic relationship at any given point in time (Asendorpf & Wilpers, 1998; Jones & Carpenter, 1986; Leary & Dobbins, 1983; Prisbell, 1991; Zimbardo, 1977). Second, regarding social situations, when shy adults overcome their inhibitions and take part in social events, they do not talk as much with others and tend to spend less time at such events (Asendorpf & Wilpers, 1998; Dodge, Heimberg, Nyman, & O'Brien, 1987; Himadi, Arkowitz, Hinton, & Perl, 1980; Twentyman & McFall, 1975; Watson & Friend, 1969). Thus, through lower likelihood of romantic involvement, shyness might limit the opportunities for adolescents to engage in problematic drinking or have sexual experiences.

Despite the reasons to think shyness might serve a protective role, there are also theoretical reasons to believe that shyness might *increase* risks for engaging in problem behavior—particularly drinking and sexual involvement. There are two main reasons. First, shy youths might drink alcohol to reduce their social inhibitions and make social interactions smoother. Alcohol drinking is often seen by adults as a means to reduce the anxiety that comes with socializing (Hartman, 1986), and research shows that alcohol reduces social anxiety (Burke & Stevens, 1999) and shyness (Hartman, 1986; O'Hare, 1990). Indeed, shy young adults report drinking more in social situations in order to cope with their shyness (Carducci, 2000) and problem drinkers tend to score higher on shyness (Lewis & O'Neill, 2000). A second reason shyness might increase the risk of problem behavior is that shyness is linked to low self-esteem, particularly during early adolescence (Cheek & Melchior, 1990; Crozier, 1995; Kemple, 1995; Schmidt & Robinson, 1992; Smith & Betz, 2002), and adolescents with low self-esteem are particularly susceptible to negative peer influences (Brown, 1990; Brown, Clasen, & Eicher, 1986). Indeed, research shows that for some individuals, shyness may be characterized by conformity to ideas and maintaining neutral attitudes toward others, described as “*going along to get along*” (Cheek & Krasnoperova, 1999; Leary & Kowalski, 1995; Lewinsky, 1941). It is easy to imagine that youths who are socially fearful and low in self-esteem might do things they believe they would

have to, such as having sex or getting drunk. Thus, shyness might exacerbate the risk for participation in problem behaviors.

There is one other possibility when considering the effects of shyness on problem behaviors. Because engaging in sexual activities often co-occurs with drinking alcohol (Crockett, Raffaelli, & Shen, 2006; Stoner, George, Peters, & Norris, 2007; Zimmer-Gembeck & Collins, 2008), drinking might in fact operate as an entry into sexual activities. Shyness may act to make drinking more likely, but inhibit the tendency to move from drinking to sexual acts. Sex with a partner represents a dramatic change in social relationships, and may be too great a change for shy youths. This may be particularly true for shy girls, who might be more likely than boys to refrain from risky sexual activities. The question, then, is whether shyness serves to protect youth from engaging in drinking alcohol and having sex, and under what conditions.

Even though parents and other adults might think of drinking and having sex as risky behaviors, research shows that many youths in traditional Western societies often view such behaviors as rather normative acts (Vazsonyi, Trejos-Castillo, & Huang, 2006). Youths would be less likely, however, to view as normative having one-time sexual encounters with previously unknown partners (one-night stands) or getting into fights while drunk. Behaviors such as these can be thought of as high-risk behaviors. These behaviors require higher levels of disinhibition, impulsivity, or lack of concern about how one is perceived by others. As such, shyness might be especially protective against high-risk behaviors.

Finally, the potential moderating effects of shyness might work differently for boys and girls. There is evidence that childhood and adolescent shyness have different consequences for men and women (Kerr, 2000), and it has been suggested that shyness is more tolerated for girls than boys because timidity is more in keeping with traditional female gender roles (Buss & Plomin, 1984; Kerr, Lambert, Stattin, & Klackenber-Larsson, 1994). A contrasting suggestion has also been made, however, that girls might experience more pressure than boys to socialize; boys' failures to engage in social interactions might make them appear independent and self-reliant (Kerr, 2000). Early maturation might also have different implications for boys and girls, as early maturing boys and their peers tend to view their own advanced maturity positively, whereas early maturing girls and their friends tend to see their own early development in a more negative light (Petersen & Crockett, 1985). Girls with advanced maturity have a tendency to get involved with older boys, and engage in problem behaviors earlier than girls with less advanced physical and psychosocial maturity (Dick, Rose, Viken, & Kaprio, 2000; Stattin & Magnusson, 1990). Boys, on the other hand, have larger peer groups (Benenson, 1990), which might lead to more opportunities for engaging in problem and risky behaviors. Thus, it is important to take gender into account when viewing the links between advanced maturity and various types of problem behaviors, and how these might be moderated by shyness.

In this study, we examine the potential moderating roles of shyness on the links between advanced maturity and problem behaviors in early adolescence. For advanced maturity, we use two measures: pubertal status and subjective age. For problem behaviors, we use drunkenness and intercourse as indicators in one model. Indicating high-risk behaviors, we use risky drinking behaviors and one-night stands in another model. We ask, first, whether those with advanced

maturity are engaging in problem behaviors and whether engaging in one problem behavior seems to lead to another (e.g., whether drunkenness leads to intercourse). We then test for possible moderating effects of shyness. Specifically, we ask whether shyness makes it more or less likely that youths with advanced maturity engage in problem behaviors or that one problem behavior leads to another. Second, we test the same links between advanced maturity and problem behaviors in another set of analyses, using the high-risk behaviors. Finally, we test the explanation that shyness will moderate risk by reducing the likelihood that youths will be involved in romantic relationships. We reason that if this is the explanation, then controlling for romantic involvement should eliminate the moderating effect of shyness. If it does not, then the explanation is something other than lessened romantic involvement. Thus, we repeat the previous models, adding romantic involvement at Time 1 as a control. Thus, the questions for this study are: (1) Is advanced maturity linked to engaging in various problem behaviors and does one type of problem behavior lead to another; (2) Are these links moderated by shyness; and (3) Do lower levels of romantic involvement explain the possible moderating effects of shyness?

Method

Participants

We used data from an ongoing longitudinal study, with two waves of data collected thus far. Students from seven schools in one municipality attending grades 7 to 9 (roughly aged 13 through 15) were included in the study. The first data collection took place in the spring of 2007, and was followed up the year after, with approximately one year between the time points. The mean unemployment rate in the city was 7.2% at the start of the study, which was somewhat higher than the average rate of 6.1% in the entire country. The average income in the municipality was 4% lower than the country average. In addition, 13.5% of the inhabitants in the community had an immigrant background.

For this study, we included 7th-8th graders participating at the first time point (Time 1) of the study. The sample includes 988 youths (487 girls and 501 boys), with a mean age of 13.73 years at Time 1. The participants were evenly distributed among 5 classrooms per grade for Time 1, and 13.9% were born in a country outside of Sweden. Sixty-five percent of the youths lived in households with both biological parents present; 19% lived in single-parent households, and 16% shared time in both parents' households.

If the participants had missing data for both time points on any of the variables used in the study, they were removed from the dataset. 201 participants met this condition. Those removed were compared with the analytic sample by means of logistic regression analysis, to establish whether any of the following variables predicted attrition: gender, age, immigrant status, and family status. Significant results emerged for gender (OR = .72, $p = .04$), showing that youths in the analytic sample were more likely than those lost to attrition to be girls. No other significant links were found, which meant that youths in the analytic sample were not more likely than those lost to attrition to differ on age, immigrant status, nor family status. The final analytic sample included 787 youths at Time 1 of the study ($M_{age} = 13.73$; 401 girls and 386 boys). Missingness

was dealt with by means of the Full Information Maximum Likelihood Estimation (FIML) method. The FIML procedure computes maximum likelihood parameter estimates and standard errors for a specified model by using all available information from the observed data (Enders & Bandalos, 2001). The procedure is considered to yield less biased estimates than listwise or pairwise deletion, and is appropriate to use when data are not missing completely at random (Schafer & Graham, 2002). A “coverage” covariance matrix in MPlus can be used to calculate the percentage of missing values (Muthén & Muthén, 1998-2007). MPlus provides robust estimates for coverage as low as 10%. Of the analytic sample, 44% of the participants had complete data. Data coverage ranged from .60 to .99, meaning that between 60 and 99% of the data were available for any given pair of variables for the remaining participants.

Procedure

Youths were assessed in their classrooms during school time. They were informed about the study and told what kinds of questions they would be asked and how long it would take to fill out the questionnaires. They were also informed that their participation was voluntary, and if they did not want to participate, they could withdraw at any time during the data collection. If they chose not to participate, they were free to do something else while their classmates were filling out questionnaires. The youths were guaranteed that their answers would not be shown to anyone outside the project, specifically not parents, teachers, or the police. The questionnaires were filled out during regular school hours, and were administered by trained research assistants. Teachers were not present during the data collection. Youths were not paid for their participation. They did, however, receive a gift of a pen or calculator with project logo. Parents were informed about the study by mail prior to the start of the data collection. They were told that they could refuse to have their youth participate (1% did) or withdraw their youth from the study at any time. Thus, youths took part in the study only if they wished to do so and their parents did not disapprove. A Regional Ethics Review Board approved all the procedures and measures used in the study.

Measures

Shyness

Shyness was measured with questions about fears in eight different situations (Gren-Landell et al., 2009). The items involve situations or actions comparable with those that reliably differentiate shy individuals from non-shy individuals (Cheek, Melchior et al., 1986). The items were about possibly awkward social situations such as speaking in front of the class, putting a hand up during class, making a phone call to someone one does not know, being with classmates during breaks, going to a party, initiating conversation with someone one does not know very well, eating with others during lunch, and looking in someone’s eyes while speaking. The participants rated themselves on a three-point scale, ranging from having *No fear* (1) to *A lot of fear* (3) of these situations. The alpha reliability was .74.

Advanced Maturity

We measured advanced maturity in two ways: by subjective age and pubertal status.

Subjective age. Subjective age was measured with four questions about how boys and girls saw themselves compared to peers their age (Galambos et al., 1999). Three items ask how old one feels, looks, and is treated by same-sex peers, whereas a fourth item asks how old one is treated by peers of the opposite sex. The response items ranged from *Much Younger* (1) to *Much older* (7). The alpha reliability was .89.

Pubertal status. We assessed pubertal status by asking about the current state of youths' physical characteristics (Williams & Dunlop, 1999). Girls and boys were asked four questions each. Three of these questions were identical. For both boys and girls, these questions related to having grown in height very quickly, having body hair (e.g., pubic hair/armpit hair), and skin change (e.g., oily skin and pimples). A fourth item for each sex (breast growth for girls, voice change for boys) is normally included. Because we were going to include boys and girls together in the analyses, we used only the three identical items. Response items ranged from *No development* (1) to *Development completed* (4). The alpha reliability for the three-item scale was .91, and it was highly correlated with the four-item scale, $r = .94$.

Romantic Involvement

Youths reported on their romantic relationship experience. The question was: Do you have or have you had a boyfriend/girlfriend? The response items ranged from *Have never had and don't want to have now* (1) to *Have now and have had before* (5).

Problematic Behaviors

We distinguished between two types of problematic behaviors: problem behaviors and high-risk behaviors. Problem behaviors were assessed by questions about drunkenness and intercourse. High-risk behaviors dealt with risky drinking behaviors and one-night stands.

Drunkenness. We measured youths' drinking habits by one item. This item was: "Have you had so much beer, liquor, or wine that you got drunk – during the past year?" The five-item response scale ranged from *No, it has not happened* (1) to *More than 10 times* (5). The cross-year correlation between the items was .62.

Intercourse. Intercourse was measured with one item, which was: "Have you had intercourse?" The response items ranged from *No* (1) to *Several times* (3). The cross-year correlation between the two items was .61.

Risky drinking behaviors. We asked youths about consequences of alcohol use that indicate problem drinking. The items were: "You don't remember what you said nor did the day after," "You ended up in a fight or row," "You said stupid things to others that you were ashamed of afterwards," "Your personality changed – you became a whole different person than you usually are," "You destroyed things such as windows, street lamps, phone booths, furniture, benches, etc.," and "You did other things that you regretted the day after." The three-item response scale ranged from *No, it has not*

happened (1) to *Several times* (3). The alpha reliabilities for this scale were .84 for Time 1, and .88 for Time 2. The cross-year correlation was .56.

One-night stands. The question about one-night stands was: “If you have had intercourse, has it happened that you’ve slept with someone on the first night?” The response items ranged from *Have not had intercourse* (1) to *Yes, it has happened several times* (4). The cross-year correlation between the two items was .59.

Plan of Analyses

A path analysis using the MPlus software (Muthén & Muthén, 1998-2007) was performed to examine prospective links between risky conditions and problem behaviors, and whether these would differ for shy and non-shy youths. We examined the links between problem behaviors over two timepoints, controlling for the effects of risky conditions at Time 1. We used two indices of model fit: the Root Mean Square Error of Approximation or RMSEA (Browne & Cudeck, 1993) and the Comparative Fit Index or CFI (Bentler, 1990). An RMSEA value of less than .08 is considered an acceptable fit, whereas a value of less than .05 is considered a very good fit (Browne & Cudeck, 1993). Acceptable fit as measured by CFI is .95, whereas values greater than .97 are considered good fit (Bentler, 1990).

The following paths were included in the model: (a) stability paths between the observed variables over time, (b) covariation paths between subjective age and pubertal status (c) within-time covariation paths between problem behaviors or high-risk behaviors (d) paths between predictors (i.e., subjective age, pubertal status) and problem behaviors or high-risk behaviors and (e) cross-lagged paths between problem behaviors or high-risk behaviors at Time 1 and Time 2. After each initial model was conducted, moderation analyses were performed by comparing shy and non-shy boys and girls by means of a multiple-group comparison procedure. Moderation refers to specifying the conditions under which particular effects of a variable on another occur (Baron & Kenny, 1986). A median split of shyness was used to indicate shy and non-shy groups, which were then split by gender. As a first step, all of the parameters in the model were constrained to be equal between the four shyness-gender groups, including the error variances. Chi-square difference tests were then conducted releasing each path of interest in the model, thus guiding the retention of the paths ultimately used in the final, best-fitting model. The error variances and the within-time variances were not included in the testing, as they were not of interest, and were hence left restrained throughout the testing procedure. Model fit indices were used to determine the best model fit. Paths in the model that were significantly different between the four groups were interpreted as moderating effects of shyness and gender. All paths presented in the results are standardized.

Results

Is Advanced Maturity Linked to Problematic Behaviors, and Does One Type of Problem Behavior Lead to Another?

Problem behaviors. To examine our assumptions that youths who are advanced in their physical or subjective maturity are more likely to engage in problem behaviors and that one type of problem behavior can lead to another, we tested a model including concurrent associations between the advanced maturity measures and problem behaviors as well as over-time associations between the problem behaviors. The correlations between the study variables are shown in Table 1. The results appear in the left-hand panel of Figure 1. As can be seen in the figure, all the paths were significant, and the results support our notion that advanced maturity is a risk condition for problem behaviors. Subjective age and pubertal status were correlated with each other and related to drunkenness and intercourse. Furthermore, both cross-paths linking the problem behaviors to each other over time were significant. Drinking alcohol was linked to increases in intercourse a year later, and intercourse was linked to increases in drunkenness a year later. The model fit was good ($\text{Chi}^2 = 15.27$; $\text{df} = 4$; $p < .01$; $\text{RMSEA} = .06$; $\text{CFI} = .99$). Thus, the analysis supports the notion that advanced physical and subjective maturity are both risk factors for engaging in alcohol drinking and intercourse. In addition, one type of problem behavior seems to lead to another.

High-risk behaviors. We tested the same model only with high-risk behaviors rather than problem behaviors. The results appear in the right-hand panel of Figure 1. As the figure illustrates, most of the paths were significant. These results offer some support for the idea that advanced maturity is linked to high-risk behaviors. Subjective age was related to risky drinking behaviors and one-night stands, but pubertal status was only marginally linked to risky drinking behaviors and was not significantly related to one-night stands. Risky drinking was, however, linked to increases in one-night stands a year later, and one-night stands predicted increases in risky drinking behaviors a year later. The model had an adequate fit ($\text{Chi}^2 = 21.33$; $\text{df} = 4$; $p < .001$; $\text{RMSEA} = .07$; $\text{CFI} = .98$). Thus, older subjective age seems to be more of a risk factor than pubertal status for engaging in high-risk behaviors, but one high-risk behavior leads to another. In sum, both problem behaviors and high-risk behaviors are to some extent linked to advanced maturity. In addition, controlling for advanced maturity, both problem behaviors and high-risk behaviors are highly predictive of each other across one year, so being involved in one seems to increase the likelihood of getting involved in the other. The question is, then, whether these links might be moderated by shyness.

Does Shyness Moderate the Links Between Advanced Maturity and Problematic Behaviors and Between One Type of Problematic Behavior and Another?

Problem behaviors. To examine the possible moderating effects of shyness for girls and boys on the links in the model shown in Figure 1, we conducted multiple group comparisons in MPlus with shyness and gender as the

grouping variables. The shyness variable was split at the median, with the lower 50% representing non-shy youths and the upper 50% representing shy youths. The groups were further split by gender, so that four groups were tested: non-shy boys ($n = 245$), shy boys ($n = 141$), non-shy girls ($n = 157$) and shy girls ($n = 244$). Mean-level differences between shy and non-shy girls and boys on all of the study variables are shown in Table 2. As a first step, all paths in the abovementioned model were constrained to be equal among the four groups ($\text{Chi}^2 = 259.79$; $\text{df} = 67$; $p < .0001$). Subsequently, one path at a time was released, and a series of chi-square difference tests were conducted to assess increases in model fit. Error variances and co-variances were not included in the testing, as they were not of theoretical interest for the paper. Thus, these paths were left constrained. If releasing a path significantly increased the overall model fit, it was retained in the model.

The results appear in Figure 2, with results for girls in the left-hand panel and results for boys in the right-hand panel. Five paths were found to significantly add to the model fit, thus showing differences between the four groups ($\text{Chi}^2 = 220.49$; $\text{df} = 61$; $p < .0001$). As shown in the figure, protective effects of shyness appeared for both boys and girls. For girls, shyness reduced the risk of advanced subjective age being related to intercourse. For boys, shyness reduced the likelihood of advanced pubertal status being related to drunkenness. Moreover, for both girls and boys, shyness reduced the risk of drunkenness leading to intercourse.

High-risk behaviors. To examine potential moderating effects of shyness in the model with high-risk behaviors, we conducted the same multiple group comparisons as described in the previous section. Again, all paths were constrained to be equal between the four groups ($\text{Chi}^2 = 329.439$; $\text{df} = 67$; $p < .0001$). In the final, best-fitting model, nearly all paths were different between the groups ($\text{Chi}^2 = 273.22$; $\text{df} = 57$; $p < .0001$), as can be seen in Figure 3, but the moderation effects seem to be concentrated to boys. There are two paths in this model that we believe are best interpreted as showing increased risk for non-shy boys, because the slopes for the entire group in Figure 1 were nonsignificant, but significant slopes emerged in the multigroup analysis for non-shy boys only. These are the links between pubertal status and both high-risk behaviors: risky drinking behavior and one-night stands. The results also show protective effects of shyness for the link between subjective age and one-night stands and the link between risky drinking behavior and one-night stands. Thus, shy boys with advanced subjective age are less likely than non-shy boys to engage in one-night stands, and risky drinking behaviors are less likely to lead to one-night stands for shy boys than non-shy boys. Thus, for boys, shyness does seem to serve as a protective factor in the development of high-risk behaviors.

Do Shy Youths' Lower Levels of Romantic Involvement Explain the Moderating Effects of Shyness?

If the protective effect of shyness in the previous analyses is due to shy youths having less romantic involvement, and by extension, having less exposure to advanced social behaviors and situations in which these kinds of problem behaviors take place, then controlling for romantic involvement in the models shown previously should eliminate the moderating effects of shyness. To test this,

we ran the same models with the inclusion of romantic involvement at Time 1 as control. For problem behaviors, the overall model including all youths showed an adequate fit ($\chi^2 = 48.47$; $df = 6$; $p < .0001$; RMSEA = .09; CFI = .96). The results are presented in the upper part of Table 3. All paths in the model were significant and similar to the previous findings. Romantic involvement was substantially linked to both drunkenness and intercourse. We then went on testing differences between shy and non-shy boys and girls, via chi-square difference tests as we did earlier ($\chi^2 = 311.13$; $df = 87$; $p < .0001$ for the initial model). The results can be seen in Figure 4. As shown in the figure, all of the moderating effects of shyness were preserved. Thus, the results for problem behaviors do not seem to support the idea that differences between shy and non-shy youths on romantic involvement can explain the moderating effects of shyness for problem behaviors. For high-risk behaviors, the overall model with all youths included had an adequate fit ($\chi^2 = 36.80$; $df = 6$; $p < .0001$; RMSEA = .08; CFI = .96). The results can be seen in the lower part of Table 3. All paths were significant, except for the links between pubertal status and high-risk behaviors. Thus, we proceeded with the multiple group tests between non-shy and shy girls and boys ($\chi^2 = 372.16$; $df = 87$; $p < .0001$ for the initial model). The results are depicted in Figure 5, and show similar patterns as the previous model with high-risk behaviors, without romantic involvement ($\chi^2 = 323.43$; $df = 80$; $p < .0001$). Again, all moderating effects of shyness that appeared in the previous model were preserved in the model controlling for romantic involvement. Judging from these results, then, it does not appear that the moderating effect of shyness can be explained by differences in romantic involvement between shy and non-shy youths.

Discussion

Peer relationships are important for adolescents, and shy adolescents might miss out on some of the benefits of peer interactions. But peer relationships are also associated with problem behaviors, particularly for early adolescents who mature early or perceive themselves more grown-up than their age mates. What this would mean for shy adolescents is not well understood. In this study, we have shown that shyness plays a moderating role. For shy adolescents, advanced maturity is less likely to mean involvement in problematic behaviors, and drinking is less likely to lead to sex or one-night stands. On the whole, this is true for boys and girls alike, but for high-risk behaviors the protective effects of shyness appear only for boys. Shy youths are less involved in romantic relationships, but that does not seem to explain these protective effects of shyness.

When introducing this study, we proposed two hypothetical mechanisms through which shyness might have a protective effect: by inhibiting behaviors in the unfamiliar situations in which problem behaviors tend to take place, or by interfering with romantic involvement - and by extension keeping youths from being exposed to peer groups with more socially advanced behavior. In this study, we tested the romantic involvement explanation. We expected that as shy individuals have been found to have problems with social interactions and romantic involvement in previous research, they would not have as many opportunities as youths with steady relationships to attend parties, social gatherings, and have intercourse. Thus, we believed that controlling for romantic

involvement in our analyses might alter or diminish the protective effects of shyness. This was, however, not the case. Shy youths were, indeed, less romantically involved, and romantic involvement was substantially linked to problem behaviors. Nevertheless, controlling for romantic involvement did not alter the moderating effects of shyness. Thus, we found no support for the romantic involvement explanation. The inhibition explanation remains a viable explanation, but there is one other possibility—that shy youths' concerns about how they are being viewed by others is what inhibits them from acting when in situations in which problem behaviors can occur. Shyness in early adolescence has been viewed as *self-conscious* (Bruch, Giordano, & Pearl, 1986; Buss, 1980; Buss, 1986). Some scholars suggest that changes during the pubertal development might stimulate the development of this type of self-conscious shyness (Cheek, Carpentieri, Smith, Rierdan, & Koff, 1986). From middle childhood and onward, youths experience a strong emergence of self-consciousness, and the development of self-conscious shyness may be rooted in this process (Bruch, 1989). These notions are supported by studies showing that from middle childhood on, shy individuals have poor self-esteem, low social self-confidence, and poor social skills compared with less shy children (Cheek & Melchior, 1990; Crozier, 1981; Crozier, 1995; Jones & Russell, 1982; Lawrence & Bennett, 1992; Miller, 1995). In situations that might involve potentially embarrassing situations, the very self-conscious shy youths might back away. Thus, the protective effect of shyness might be due to either temperamentally based inhibition of behavior in novel situations or self-conscious concerns about social behavior. These explanations await testing.

In previous research, there have been two opposing sets of results concerning shyness and alcohol use. On the one hand, shyness has been found to be a protective factor against drinking (Bruch et al., 1992; Dubow, Boxer, & Huesmann, 2008; Ham & Hope, 2005; LaBrie, Pedersen, Neighbors, & Hummer, 2008; Park, Sher, & Krull, 2006; Rogosch, Chassin, & Sher, 1990; Rohsenow, 1983; Tran, Haaga, & Chambless, 1997). On the other hand, shy individuals have also been found to use alcohol as a social lubricant, as means of coping, or an anxiolytic substance in social situations (Burke & Stevens, 1999; Carducci, 2000; Hartman, 1986; Lewis & O'Neill, 2000; O'Hare, 1990). There might be a difference between early adolescence and initiation of problem behaviors compared with the adult samples used in these studies. For shy early adolescents, the new situations and behaviors involved in alcohol drinking might produce an inhibiting response. For shy adults, who have more free access to alcohol and can choose the situations in which they use it, use of alcohol might be more instrumental. Whether alcohol use develops in this way for shy people, however, will have to be answered by future studies following shy early adolescents into adulthood.

In this study, we looked at two types of problematic behaviors. The problem behaviors referred to drunkenness and intercourse, which might be rather normative even among early adolescents, even though many adults might view them as risky. Therefore, we distinguished between these types of behaviors and those of a more hazardous nature, such as for example having one-night stands with unknown people and doing things one would regret after drinking alcohol. Even though these behaviors were correlated, however, our analyses revealed certain differences in their implications. First, shyness and gender

moderated many links between advanced age and problem behaviors, even after adding romantic involvement into the equation. Thus, for these, more initial types of problem behaviors, it seems that shyness did have a protective role regarding several links. Regarding the high-risk behaviors, however, the protective effects of shyness seemed to be present only for boys. Perhaps when shy girls are in situations when they are already drunk or have had intercourse with their romantic partner, it might be that they engage in risky behaviors more easily, as they might be more susceptible to peer and social pressures. These results show the importance of distinguishing between different levels of problem behaviors when viewing their development in early adolescence.

A surprising finding was that overall, boys rather than girls who were more mature were higher on problem behavior. Much previous research has shown that early maturing girls have a higher tendency than their peers to be involved in such problem behaviors as internalizing and externalizing behaviors, substance use, school adjustment, sexual abuse, and relationships with others (Alsaker, 1995, 1996; Buchanan, Eccles, & Becker, 1992; Celio, Karnik, & Steiner, 2006; Galambos et al., 1999; Graber, 2003; Mendle, Turkheimer, & Emery, 2007; Stattin & Magnusson, 1990; Susman, Dorn, & Schiefelbein, 2003; Turner, Runtz, & Galambos, 1999). Given this, one might expect shyness to be more protective for girls than boys. Note, however, that our measure of advanced maturity was probably not very sensitive to early timing for girls, as early timing measures typically make distinctions within the years prior to when our pubertal status measure was taken. Considering this, the lack of gender differences are not as surprising as they seem at first.

There were some limitations to the study. First, we only used one item for some observed variables in the analyses. This yields a less stable estimate of the constructs being measured. Second, the evidence supporting our proposed model could be strengthened by multiple times of measurement, rather than only two. Despite these limitations, however, the study has several strengths. First, the sample comprised early adolescents. Most previous studies have focused on college students and adults, even though alcohol use might be initiated in early adolescence (Sartor, Lynskey, Heath, Jacob, & True, 2007). Second, we used a large sample of youths, with pupils from seven different schools in an entire municipality. This gives us a wide variety of individuals, as some of the schools were even considered having “problematic” pupils. The use of longitudinal data was also a strength. Thus, despite its limitations, the study adds to the current knowledge on how the link between advanced maturity and problematic behaviors might differ for young people.

Growing up poses many challenges for early adolescents. First, they are of a certain chronological age, but they might have matured more or less physically compared to their peers. And to make matters even more complicated, they might as a result feel more or less adult. This study shows that the effects of older advanced maturity on problem behaviors might be dampened by behavioral characteristics, in this case shyness. Primarily, we have shown that shyness is not necessarily always a drawback. Previous research shows that shy individuals might be delayed in completing certain individual developmental tasks such as dating or sexual interactions, but at a later point in time they are just as “developed” as their less-shy peers (Kerr, 2001; Kerr, Lambert, & Bem, 1996). Perhaps then, it is positive to be shy in early adolescence, at least in the sense of

engaging in behaviors that might lead to unwanted consequences in adulthood. Parents and teachers often worry about shy children, and try to find ways to bring them out of their shells and make them more outgoing. Perhaps they would be comforted by knowing that there may be a bright side to shyness. A few years later they might have less to worry about than parents of the more outgoing children.

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Table 1.
Correlations Between All of the Study Variables

	1	2	3	4	5	6	7	8	9	10	11
1. Shyness T1	-										
2. Subjective Age T1	-.21***	-									
3. Pubertal Status T1	.03	.34***	-								
4. Romantic Involvement T1	-.13***	.21***	.13***	-							
5. Drunkenness T1	-.10***	.22***	.19***	.24***	-						
6. Drunkenness T2	-.09**	.18***	.19***	.23***	.62***	-					
7. Risky Drinking Behaviors T1	-.08*	.18***	.11**	.22***	.66***	.51***	-				
8. Risky Drinking Behaviors T2	-.04	.10**	.09**	.17***	.49***	.66***	.56***	-			
9. Intercourse T1	-.08**	.27***	.19***	.36***	.50***	.40***	.46***	.33***	-		
10. Intercourse T2	-.15***	.27***	.22***	.41***	.49***	.55***	.43***	.46***	.61***	-	
11. One-night stands T1	-.08**	.30***	.15***	.30***	.49***	.41***	.51***	.34***	.81***	.55***	-
12. One-night stands T2	-.14***	.27***	.19***	.32***	.46***	.57***	.49***	.51***	.56***	.83***	.59***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Table 2.

Analysis of Variance on Study Variables for Shy and Non-Shy Boys and Girls with Tukey's Post Hoc Tests

Variable	Non-Shy Boys	Shy Boys	Non-Shy Girls	Shy Girls	<i>df</i>	F
Pubertal Status T1	2.67 (.58) ^{cd}	2.62 (.56) ^{cd}	2.84 (.62) ^{ab}	2.91 (.57) ^{ab}	952	12.92***
Subjective Age T1	4.30 (.96) ^{bd}	3.89 (.88) ^{bc}	4.37 (1.01) ^{cd}	4.04 (.91)	943	12.07***
Romantic Involvement T1	3.06 (1.07) ^{bd}	2.79 (.94) ^{ac}	3.12 (1.14) ^{bd}	2.77 (1.11) ^{ac}	942	6.48***
Drunkenness T1	1.39 (.95) ^b	1.14 (.56) ^{ac}	1.44 (.85) ^{bd}	1.24 (.67) ^c	951	6.15***
Drunkenness T2	1.61 (1.24)	1.37 (.90)	1.67 (1.11)	1.46 (1.00)	836	2.98*
Risky Drinking T1	1.21 (.40) ^{bd}	1.11 (.32) ^a	1.15 (.27)	1.12 (.28) ^a	665	3.24*
Risky Drinking T2	1.23 (.45)	1.22 (.44)	1.22 (.40)	1.17 (.38)	690	.80
Intercourse T1	1.24 (.60) ^b	1.08 (.35) ^a	1.18 (.54)	1.16 (.53)	941	3.45*
Intercourse T2	1.49 (.81) ^{bd}	1.17 (.50) ^{ac}	1.43 (.80) ^b	1.28 (.69) ^a	845	7.96***
One-Night Stands T1	1.35 (.76) ^{bcd}	1.14 (.52) ^a	1.14 (.35) ^a	1.18 (.52) ^a	868	7.10***
One-Night Stands T2	1.58 (.94) ^{bcd}	1.25 (.70) ^a	1.29 (.55) ^a	1.26 (.65) ^a	753	9.81***

Note. Superscripts indicate differences between the groups. ^{abc} = significantly different from the other three groups.

* $p < .05$, ** $p < .01$, *** $p < .001$

Table 3.

Results from Multiple Group Comparisons Between Shy and Non-Shy Girls and Boys on the Links Between Advanced Maturity, Romantic Involvement, and Problematic Behaviors

Variables	β	
<u>Problem Behaviors</u>		
<i>Predicting Drunkenness T1</i>		
Subjective Age T1	.16	***
Pubertal Status T1	.10	***
Romantic Involvement T1	.25	***
<i>Predicting Intercourse T1</i>		
Subjective Age T1	.15	***
Pubertal Status T1	.09	**
Romantic Involvement T1	.33	***
<i>Stabilities Time 1 to Time 2</i>		
Drunkenness	.49	***
Intercourse	.45	***
<u>High-Risk Behaviors</u>		
<i>Predicting Risky Drinking T1</i>		
Subjective Age T1	.11	***
Pubertal Status T1	.05	
Romantic Involvement T1	.19	***
<i>Predicting One-Night Stands T1</i>		
Subjective Age T1	.21	***
Pubertal Status T1	.04	
Romantic Involvement T1	.23	***
<i>Stabilities Time 1 to Time 2</i>		
Risky Drinking	.33	***
One-Night Stands	.46	***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

Figure Captions

Figure 1. Cross-lagged path models with advanced maturity predicting problem behaviors and high-risk behaviors, respectively

Note. † $p < .05$, * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 2. Moderating effects of shyness and gender in cross-lagged path models with advanced maturity predicting problem behaviors

Note. Upper number is non-shy, lower is shy. ^a = significantly different from the other three groups. For clarity, paths that did not differ between groups are illustrated with dotted lines. * $p < .05$, ** $p < .01$, *** $p < .001$.

Figure 3. Moderating effects of shyness and gender in cross-lagged path models with advanced maturity predicting high-risk behaviors

Note. Upper number is non-shy, lower is shy. ^a = significantly different from the other three groups. For clarity, paths that did not differ between groups are illustrated with dotted lines. * $p < .05$, ** $p < .01$, *** $p < .001$.

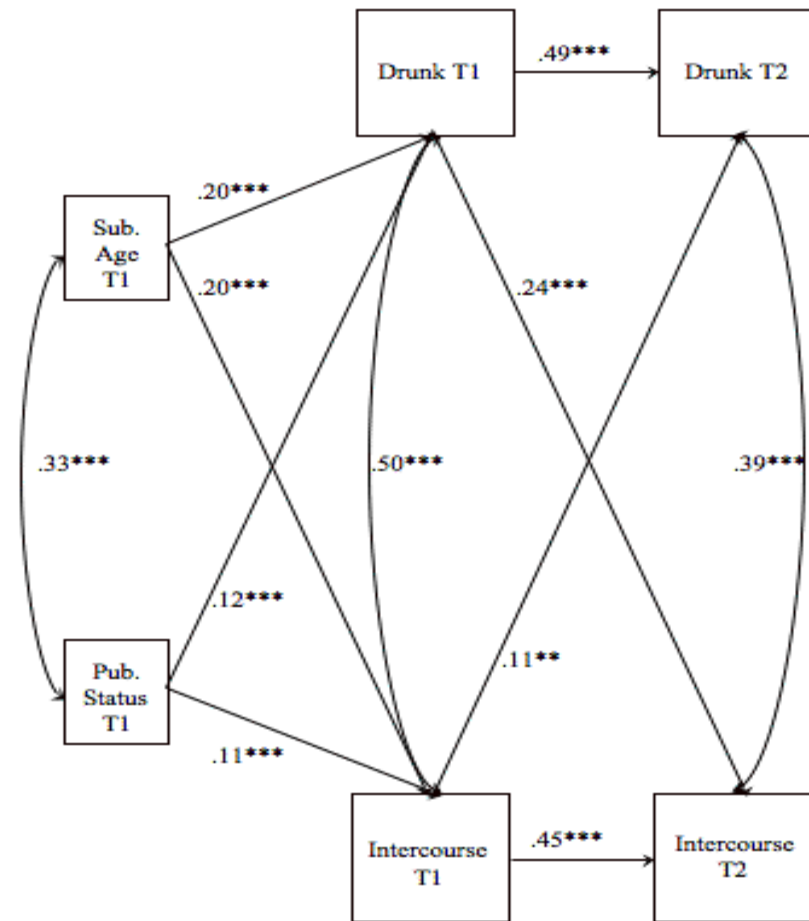
Figure 4. Moderating effects of shyness and gender in cross-lagged path models with advanced maturity and romantic involvement predicting problem behaviors

Note. Upper number is non-shy, lower is shy. ^a = significantly different from the other three groups. For clarity, paths that did not differ between groups are illustrated with dotted lines. * $p < .05$, ** $p < .01$, *** $p < .001$.

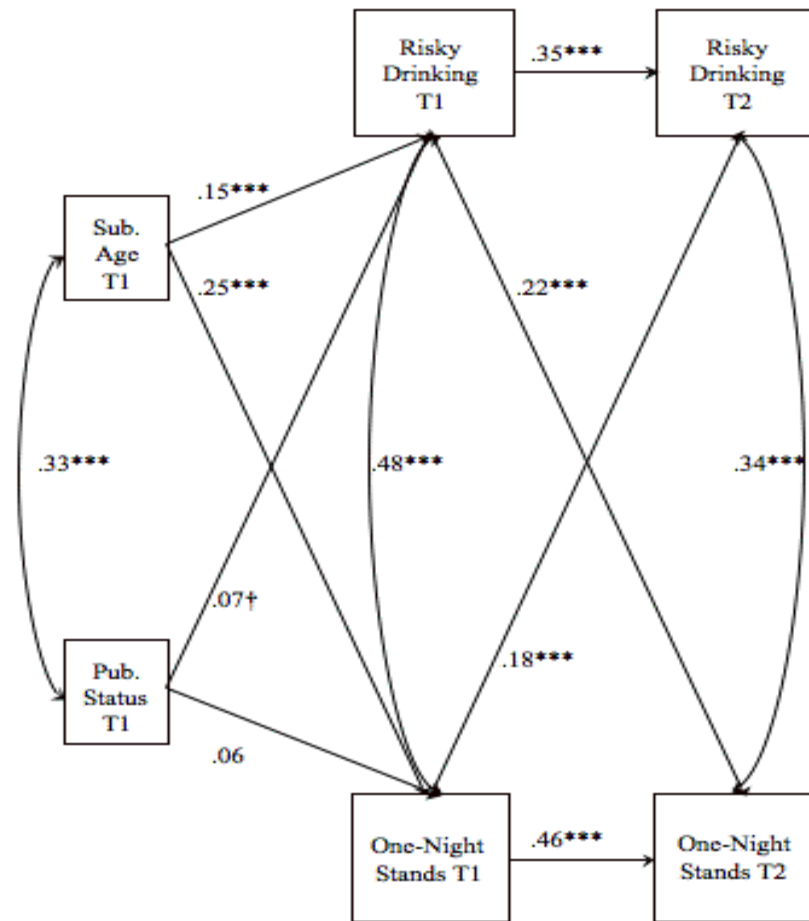
Figure 5. Moderating effects of shyness and gender in cross-lagged path models with advanced maturity and romantic involvement predicting high-risk behaviors

Note. Upper number is non-shy, lower is shy. ^a = significantly different from the other three groups. For clarity, paths that did not differ between groups are illustrated with dotted lines. * $p < .05$, ** $p < .01$, *** $p < .001$.

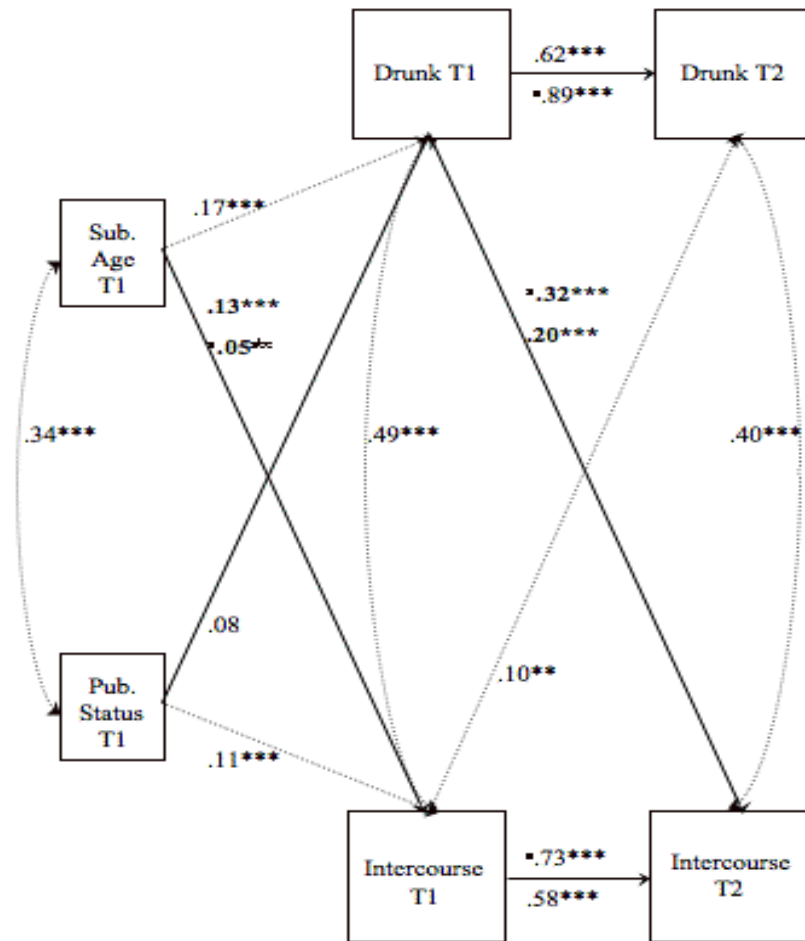
Problem Behaviors



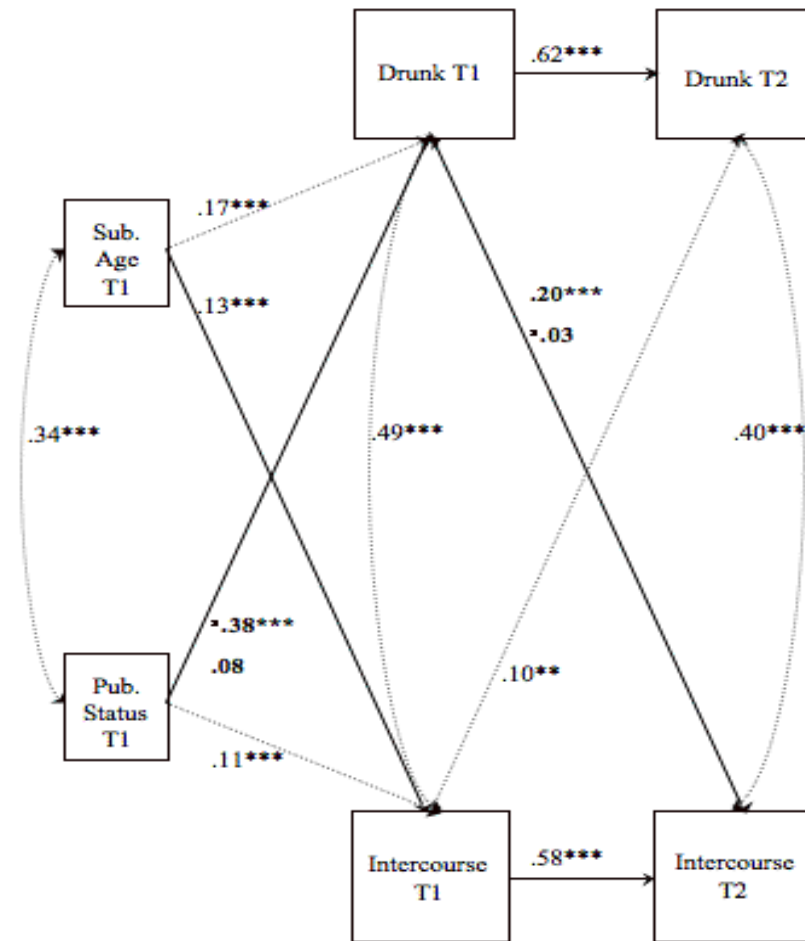
High-Risk Behaviors



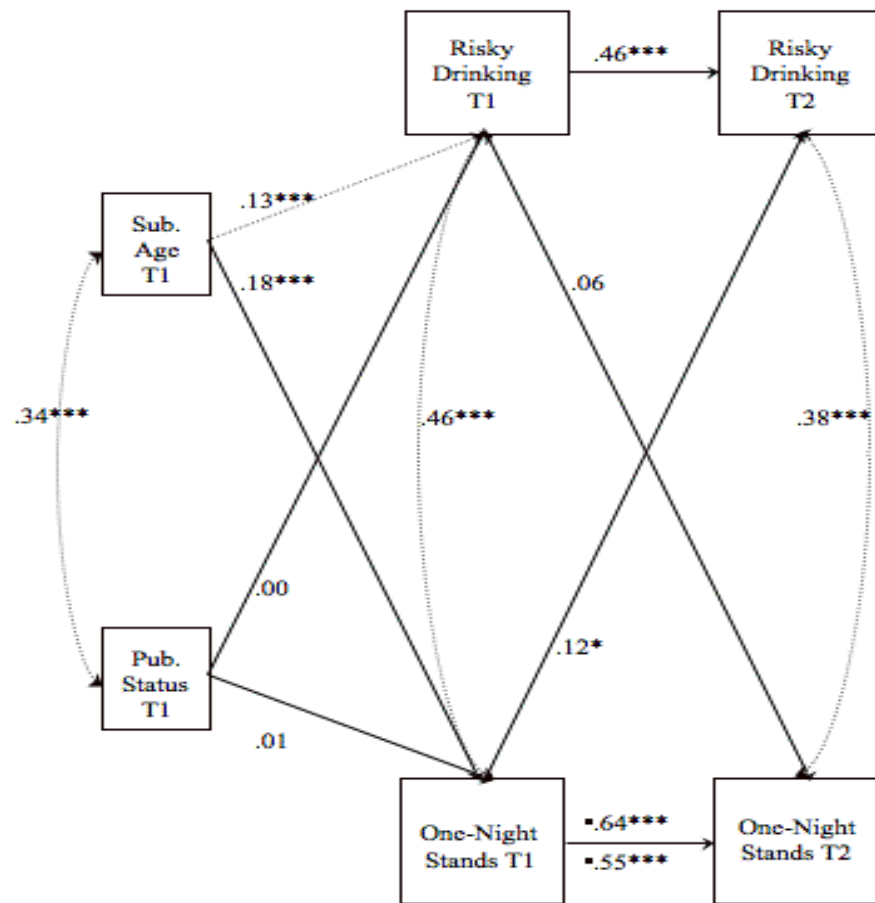
Girls



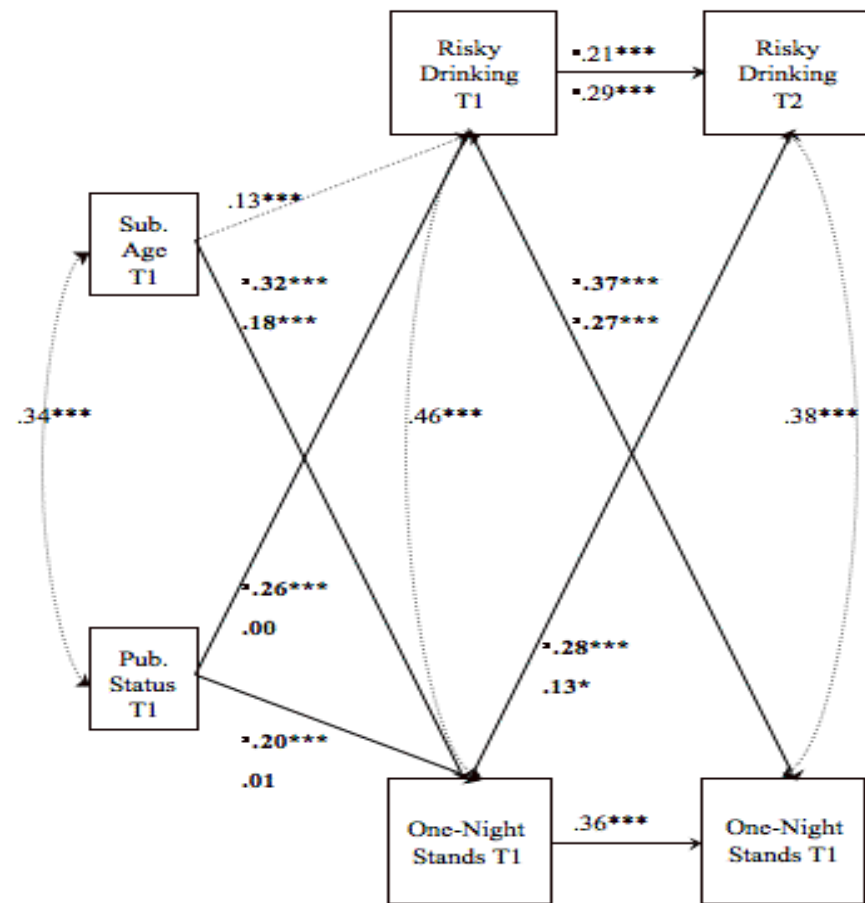
Boys



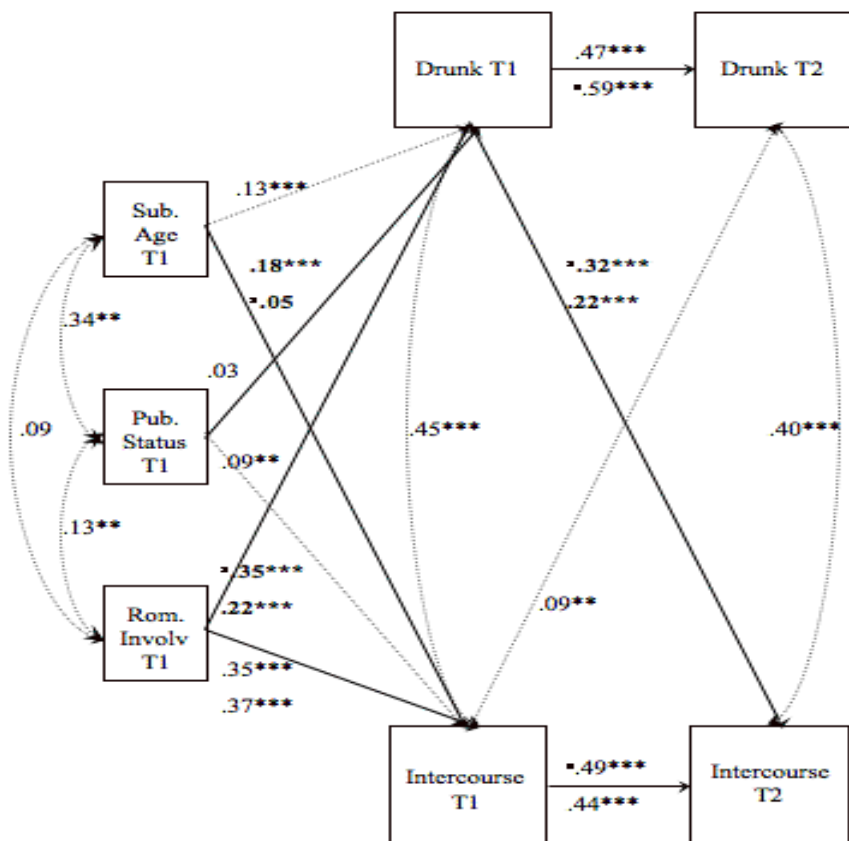
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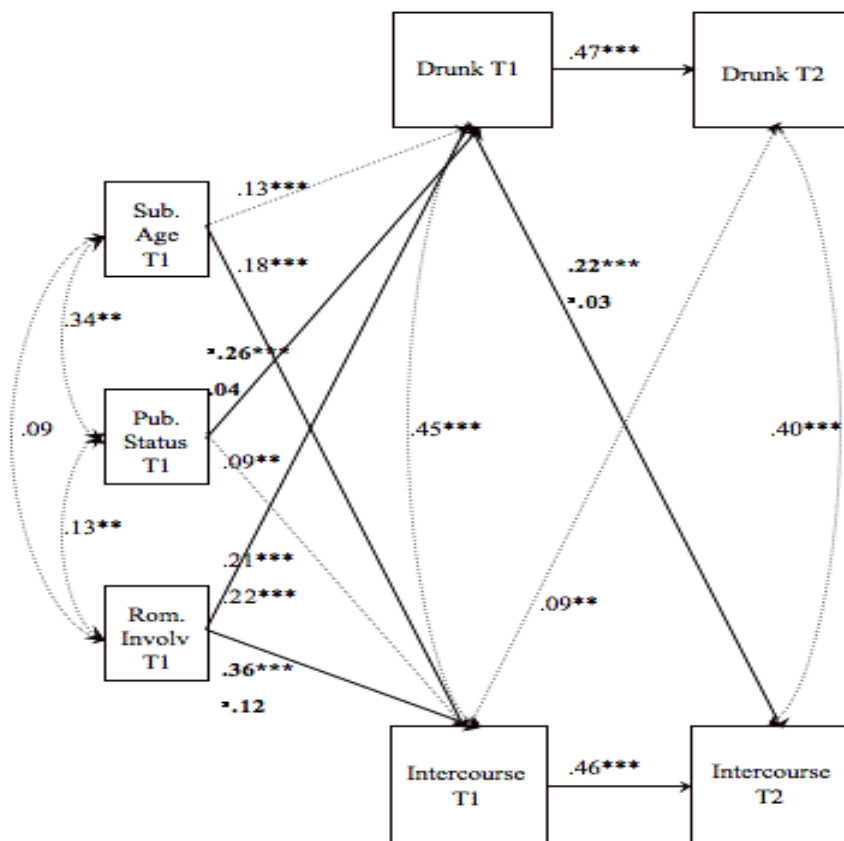
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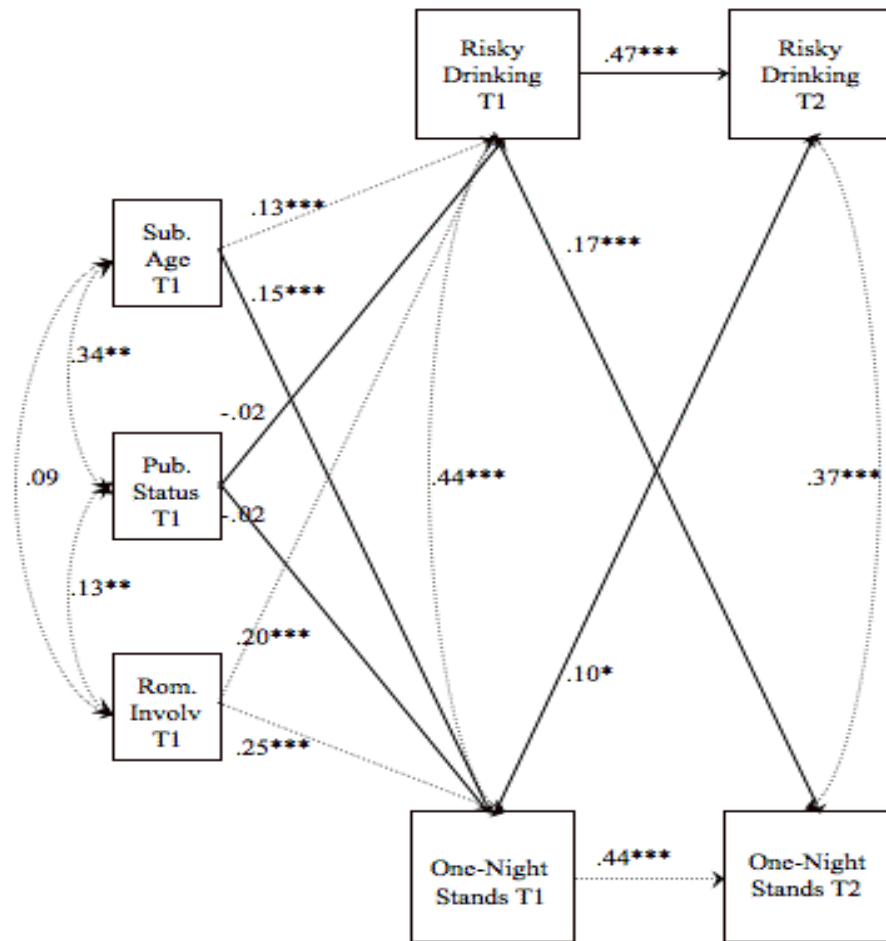
Girls



Boys



Girls



Boys

