

PATTERNS OF FRIEND INFLUENCE ON SCHOOL ENGAGEMENT AND THE
MODERATING EFFECTS OF MATERNAL AFFECTION

by

Donna Marion

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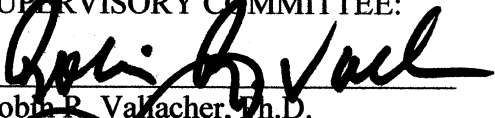
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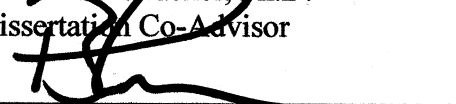
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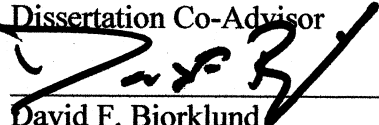
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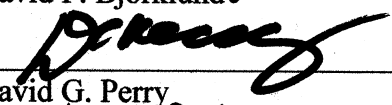
This dissertation was prepared under the direction of the candidate's dissertation co-advisors, Dr. Robin Vallacher and Dr. Brett Laursen, Department of Psychology, and has been approved by the members of her supervisory committee. It was submitted to the faculty of the Charles E. Schmidt College of Science and was accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy.


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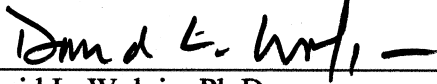

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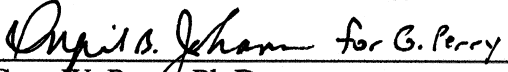

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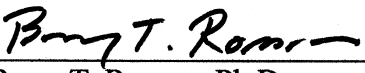

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ABSTRACT

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This study investigated friend influence on school engagement in a sample of 160 stable same-sex friendship dyads (94 female dyads and 66 male dyads) from five senior high schools and four vocational schools in a small city in central Finland. Longitudinal data were collected during the first and second years of upper secondary school, approximately one year apart, and self-reports were available from both members of each friendship dyad. The framework of the Actor-Partner Interdependence Model (APIM; Kenny, Kashy & Cook, 2006) was used to estimate friend influence on school engagement in a model that did not distinguish same-sex friends, in a direct-effects model that distinguished friends based on relative levels of school burnout, and in a multiple-group model for distinguishable friends that investigated perceptions of maternal affection as a moderator of friend influence. Results suggest that the higher

burnout partner in a friendship dyad influenced a decline in the lower burnout partner's school engagement only when the lower burnout partner perceived low maternal affection. When the lower burnout partner perceived high maternal affection, there was no evidence of negative influence by a higher burnout partner. Patterns of influence did not vary as a function of sex or school track. The importance of distinguishing friends on a theoretically and statistically meaningful basis to learn who influences whom, and of investigating indirect effects models when studying friend influence is also discussed.

DEDICATION

This work is dedicated to my family. My understanding and patient husband, Joe, has supported me, both emotionally and financially, through many years of study and research. His encouragement has never faltered. My grown children, Ryan and Danielle, their spouses Mike and Steve, and my adolescent twin sons Zachary and William are a never-ending source of knowledge and inspiration. Through them, I learn something new every day. I hope to instill in them my love of learning. Knowledge can be found everywhere, and it is never too late to seek it. Finally, I dedicate this work to my children's children, Nekoro, Michael, and yet unborn, whom I hope will be benefactors of insights gained from this and future research in the field of child and adolescent development.

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INTRODUCTION

Friends influence one another's thoughts, feelings, and behaviors (Kandel, 1978). The influence of friends is strongest during adolescence (Berndt, 1999), when youth are separating from their parents, gaining autonomy, and discovering a sense of self. Although research clearly indicates that friends influence one another, little is known about each partner's relative influence and about characteristics that make one friendship partner more influential than the other.

Gaining better insight into mechanisms of friend influence is important because research suggests that friend influence is a *risk factor* for developing *risk behaviors* such as tobacco use, alcohol use, illicit drug use, sexual activity, delinquency, and disruptive behaviors at school (Berndt & Keefe, 1995; Chassin, Presson, Sherman, Montello, & McGrew, 1986; Engels, Vitaro, Den Exter, Blokland, de Kemp, & Scholte, 2004; Jaccard, Blanton, & Dodge, 2005; Kandel, 1978; Popp, Laursen, Kerr, Stattin, & Burk, 2008; Urberg, Değirmencioglu, & Pilgrim, 1997; Vitaro, Brengden, & Tremblay, 2000). *Risk factors* are variables that promote the development of *risk behaviors*, which in turn is defined as behaviors that threaten life course success (Jessor, 1991). According to Jessor, low school engagement is one obvious risk behavior that compromises development during adolescence. But not all youth develop risk behaviors when exposed to risk factors because *protective factors* operate to buffer effects of risk

factors. Risk factors are often directly linked with outcomes, whereas protective factors tend to be indirectly linked with outcomes (Rutter, 1990). High quality relations with mothers is one such protective factor. Research has demonstrated that a good maternal relationship moderates effects of negative friend influence on binge drinking (Jaccard et al., 2005) and delinquency (Vitaro et al., 2000).

Most research on friend influence during adolescence has focused on risk behaviors in the form of substance abuse and delinquency. There is a paucity of research on friend influence in other areas. No one has investigated the effects of friend influence on school engagement, which is surprising given the importance of school engagement to future life course success. In fact, school engagement is seldom investigated as an outcome variable.

Research has linked school engagement with *school burnout* (Salmela-Aro, Savolainen, & Holopainen, 2009), which is a state of exhaustion characterized by feelings of scholastic incompetence and a detached, cynical attitude toward school. Although school burnout and depression are related, these constructs capture different psychological processes; depression is a global cognitive-affective state, whereas school burnout is a cognitive-affective state specifically related to academics. Given that school burnout is specific to the school context, it is plausible that individual differences in school burnout distinguish who within a friendship dyad influences whom on school engagement.

Recently, statistical techniques were introduced that identify the effect of individual characteristics on the friend influence process (Laursen, Popp, Burk, Kerr, &

Stattin, 2008). This novel design will be used to fill gaps in the literature on friend influence and school engagement. First, whether friends influence one another's level of school engagement will be assessed. The study will then examine whether the relative level of school burnout for each partner within a friendship dyad affects the pattern of influence between friends on school engagement during adolescence. Finally, whether patterns of influence are moderated by adolescents' perception of maternal affection will be investigated.

Influence of Friends during Adolescence

Homophily is the tendency for friends to be similar in terms of their thoughts, feelings, and behaviors (Lazarsfeld & Merton, 1954). Research has shown that adolescents are similar to their peers in many respects, including internalizing problems (Hogue & Steinberg, 1995), externalizing behaviors (Cairns & Cairns, 1994), depressive symptoms (Stevens & Prinstein, 2005), illicit drug use (Halebsky, 1987; Meier, Burkett, & Hickman, 1984), alcohol use (Dishion & Loeber, 1985; McLaughlin, Baer, Burnside, & Porkorny, 1985), cigarette smoking (Hirschman, Leventhal, & Glynn, 1984), delinquency (Dishion, Spracklen, Andrews, & Patterson, 1996; Gomme, 1985), sexual behavior (Billy & Udry, 1985; Collins & Harper, 1985), classroom engagement (Kindermann, 1993), and academic achievement (Chen, Chang, & He, 2003; Kindermann, McCollam, & Gibson, 1996; Ryan 2001).

Three processes are responsible for friendship homophily: *selection*, *deselection*, and *influence* (Cohen, 1977; Kandel, 1978). *Selection* refers to the tendency to choose similar others as our affiliates. *Birds of a feather flock together*. For example, we

choose friends based on age, sex, race, propinquity, and common interests. When incongruence arises and persists between friends' attitudes or behaviors, *deselection* occurs. During the deselection process, friendships with dissimilar others are dissolved. Finally, *influence* is a socialization process whereby we become more similar to our friends and affiliates due to their influence on our thoughts, feelings and behaviors. The present investigation focuses on homophily resulting from the friend influence process.

Why study influence during adolescence? Formation of a coherent sense of self is the primary task or 'crisis' of adolescence (Erikson, 1950). Friends are instrumental in this process. During adolescence, youth begin spending more time with their peers, as they gain independence from their parents and autonomy in the social world. Through interaction with peers, adolescents gain their first true sense of self (Sullivan, 1953), seeing themselves and their social world through the eyes of their peers ("the looking glass self," Cooley, 1902). Not surprisingly, adolescence is the period when susceptibility to peer influence is greatest (Berndt, 1979; Clasen & Brown, 1985; Steinberg & Silverberg, 1986). Mid adolescence is a particularly important period when disruption of academic engagement can have deleterious consequences on life course success, because college admission criteria focus on academic performance exclusively during the senior high school period.

Theories on friend influence. Theoretical accounts of how friends' individual characteristics might affect influence between friends have not been well developed (Hartup & Stevens, 1997). Some models of friend influence have applied a social learning perspective (Berndt, 1999; Wentzel, Barry, & Caldwell, 2004). More

specifically, the tenets of observational learning (Bandura, 1977) support the notion that when a friend models a specific attitude or behavior, an individual is likely to adopt that attitude or behavior at some time in the future. The more the individual is exposed to a specific attitude or behavior being modeled, the greater the likelihood that the individual will come to think or behave in the same way. This is particularly true when the individual identifies with the person modeling the attitude or behavior. A dyadic friendship sets the perfect stage for this type of influence, not only because friends spend a lot of time with one another, but also because they identify with each other and share a strong emotional bond.

A review of the literature on friend influence. The earliest studies on friendship homophily did not distinguish between selection and influence processes. Guided by the presumption that friend influence is demonstrated when partners' characteristics are similar, researchers used correlations of friends' characteristics at one point in time to assess friend influence. These studies failed to account for the fact that friends are similar from the outset of the relationship because we seek similar others as friends. As a result, influence inferences drawn from similarity correlations at one point in time are misleading because they ignore the selection process and overstate influence. In the first empirical study to distinguish socialization from selection effects in friendship homophily, Kandel (1978) separated selection and socialization (influence) processes in a longitudinal examination of stable friendships. Measures were taken from each member of several hundred adolescent friend dyads at two points in time. The longitudinal design enabled separation of initial similarity (which infers

selection processes) from increases in similarity between time one and time two (which infers influence processes). Measuring homophily with Kendall's tau (τ) coefficient, Kandel demonstrated that in adolescent friendships, homophilic selection and influence are each responsible for friend similarity in behaviors such as illicit drug use and attitudes such as political orientation.

A number of studies on friend influence have been conducted since Kandel's (1978) seminal work, using the longitudinal design that enables selection processes to be distinguished from influence processes. For example, Chassin, Presson, Sherman, Montello, and McGrew (1986) combined cross-sectional and longitudinal designs to demonstrate friend influence on tobacco use in a 6th to 11th grade Midwestern U.S. sample. Data were collected at two time points across one year. The investigation used a sample-based method of controlling for selection effects, where only participants who had never smoked at time one were included in the analysis. Logistic regressions demonstrated that friend influences (e.g., smoking behaviors and attitudes) predicted increases in smoking behaviors across all age groups. Although the longitudinal design enabled friend influence to be examined by assessing change in tobacco use in non-smokers from time one to time two, the design contains a shortcoming that was prevalent in many early studies of friend influence: participants reported their perceptions of their friends' attitudes and behaviors. Studies where participants provide data on individual characteristics for themselves and their friends are biased. Adolescents are not accurate reporters of how their friends think or behave. One potential bias resulting from using participant reports of friend behaviors and attitudes

centers on the notion that individuals often perceive their friend's characteristics to be more similar to their own than they really are, projecting their own characteristics onto their friends (Berndt, 1999). Another potential bias resulting from using participant reports of friend behaviors involves the participant's attributional style; a participant's perceptions of their friend's characteristics may be a better measure of the participant's tendency to view others in a certain way than the friend's actual characteristics.

Friends also influence each other's alcohol use. Urberg, Değirmencioğlu, and Pilgrim (1997) demonstrated friend influence on alcohol and tobacco use in stable and unstable friendships, as well as in friendship groups, in a large Midwestern U.S. sample of adolescents. Data were collected from 6th, 8th, and 10th grade participants in the fall and spring of the same school year (approximately seven months apart). Adolescents nominated their best friend in school, followed by up to nine other good friends in school. Participants were matched with friends and sociograms were drawn to identify friendship groups. To control for selection effects, only adolescents who reported never having used the substance (alcohol or tobacco) were included in the investigation. To preclude issues associated with shared-reporter biases, Urberg et al. assessed participants' friends' alcohol and tobacco use directly, through friends' self-reports of usage. Using hierarchical logistic regression, friend influence was found to predict first-time experimentation with both alcohol and tobacco, as well as the transition from first-time experimentation to more frequent use of alcohol (the friendship group was responsible for transitioning into tobacco use).

Yet another area where friends influence one another involves deviancy (e.g., disruptiveness, aggressiveness, physical violence, theft, and vandalism). Vitaro, Brengden, and Tremblay (2000) demonstrated that boys' deviant behaviors in adolescence are influenced by the deviancy of their best friends. Participants named their best friend and up to three other friends in the same class when they were 11 years old and again when they were 12 years old. A best friendship was identified at each time point when a nominated best friend reciprocated the participant's nomination by naming the participant as his or her best or one of three close friends. Participants rated best friends' behaviors at age 11 and again at age 12. When participants had a best friend at both age 11 and 12, both friends were considered by averaging deviancy scores. Controlling for initial level of delinquency in hierarchical linear regression analysis, the boys' best friends' deviant behaviors at ages 11 and 12 predicted self-reported delinquency when the boys were 13 to 14 years old.

In addition to investigating friend influence generally, researchers have recently undertaken examination of potential moderators of friend influence and individual differences in the influence process. For example, Jaccard, Blanton, and Dodge (2005) demonstrated friend influence on sexual activity and binge drinking, and the protective effects of a good maternal relationship, using the Add Health school-based sample of adolescents in grades 7 through 12 (total $n = 20,745$ from 80 high schools and their 134 feeder schools). Measurements were taken at two time points, approximately one year apart. Jaccard et al. focused on individuals who nominated at least one same-sex friend (they were asked to nominate up to five), who were in grades 7 through 11, and who

participated at both time one and time two, resulting in a targeted sample of 1,692 individuals. It was possible to link data between each targeted participant and their nominated friend. Friends were paired based on a behavior approach that assessed friendship closeness on a 5-item scale. Of the friends nominated, the friend with the highest closeness score was paired with the participant. Neither nomination reciprocation nor stability of the friendship across the two measurement points was requisite to establish a friendship pairing, but these factors were investigated as interaction terms with the influence variables in logistical regressions. Selection effects were controlled by entering both target and friend time one scores for the risk outcome of interest (either sexual behavior or binge drinking) into the logistic regression equation, thus partialling out initial friend similarity. Results suggest peer influence on both risk behaviors. But when the target adolescent's perception of their relationship with their mother was entered into the regression as an interaction term with peer binge drinking or peer sexual behavior, as the case may be, the magnitude of friend influence effects on the target's sexual behavior was reduced, and the significant effect of friend influence on binge drinking disappeared. Adolescents' relationships with their mothers served as a protective factor against risky binge drinking behavior such that as satisfaction with the maternal relationship increased, friends' influence on binge drinking diminished.

Bot, Engels, Knibbe, and Meeus (2005) investigated individual differences in friend influence on drinking behaviors. Using data from a 12- to 14-year-old sample in the Netherlands, Bot et al. argued that when compared to the less popular member of a

friendship dyad, the more popular member is more influential on his or her friend's drinking behaviors. Nominations of up to five best friends were used to identify friends in the same school. Nominations of the five most popular and five least popular students in the class were used to calculate unique popularity difference scores for both the adolescent and his friend; each partner's 'least popular' score was subtracted from their 'most popular' score to derive one popularity score for each partner. A unique difference score was calculated for each partner (i.e., the partner's friend's score subtracted from his or hers). Measures of alcohol consumption were taken from both the adolescent and his or her friend. Results demonstrated that the more popular friend was more influential in unilateral friendships (when friend nominations were not reciprocal). The authors' explanation for the null findings for reciprocated friendships suggested that reciprocal friends may share a history wherein influence has already transpired, resulting in a ceiling effect for further influence and change.

To summarize the literature discussed thus far, first, friends influence one another's behaviors and attitudes in a number of areas during adolescence. Second, individual characteristics of friends (e.g., popularity) may make one partner in a friendship dyad more influential than another. Third, certain characteristics of adolescents' parental relationships may buffer effects of negative peer influence. Two gaps in the literature merit mention. First, all of the studies discussed above except one (Bot et al., 2005) examined dimensions of friend influence without considering individual characteristics that may make one friendship partner more influential than the other in those dimensions. Second, the correlated nature of data collected from

friendship partners violates assumptions of independence, rendering traditional statistical techniques ill-suited for investigating friend influence (Laursen, Popp, Burk, Kerr, & Stattin, 2008).

Recently, two studies investigated individual characteristics that may make one partner more influential than the other, in a statistical design that simultaneously considers nonindependence in the data and potential bidirectional influence effects. Popp, Laursen, Kerr, Stattin, and Burk (2008) used the Actor-Partner Interdependence Model (APIM; Kenny, Kashy, & Cook, 2006), described in more detail below, in a longitudinal design to distinguish selection from socialization processes, and ultimately demonstrated that the relatively older partner in a friendship dyad exerts greater influence over their partner's drinking behavior than does the younger member of the dyad. Popp et al.'s sample included 451 friendship dyads identified through reciprocated participant nominations of same-sex friends. Participants ranged in age from 12 to 18, and each member of the friendship dyad reported on their own intoxication frequency. Individuals were only included in the sample once to preclude problems with independence that results when there are unequal contributions from participants. Similarly, Laursen, Hafen, Burk, Kerr, and Stattin (in press) used a longitudinal APIM design to demonstrate that the member of a friendship dyad that is more socially accepted (a phenomenon that is distinct from popularity) becomes increasingly influential over his partner's intoxication frequency and delinquent behaviors across time, while the less accepted member of the friendship dyad does not significantly influence his or her partner's intoxication frequency or delinquent

behaviors. Laursen et al.'s sample included 173 friendship dyads identified through reciprocated same-sex friend nominations. Participants were in the 7th (age 12) and 10th (age 15) grades at the outset of the study. Each member of the friendship dyad reported on their intoxication frequency and delinquent behaviors, and individuals were only included in the sample once. Other domains where friends influence one another, and other characteristics that may make one friendship partner more influential than the other beg further investigation.

Risk Factors and Protective Factors

Psychosocial *risk behaviors* are behaviors that compromise successful adolescent development and jeopardize future outcomes (Jessor, 1991). Understanding determinants of a risk behavior requires identifying antecedent *risk factors* that promote development of the risk behavior, as well as *protective factors* that serve to mitigate effects of risk factors and minimize or forestall emergence of the risk behavior. Rutter (1990) suggested that risk factors often have a direct effect on outcomes whereas protective factors often have an indirect effect, serving as buffers against risk factors.

Adolescent development unfolds in a social environment that contains both risk and protective factors (Jessor, 1991). Adolescents' relationships with their parents and their peers are the most important aspects of their social world (Rubin, Bukowski, & Parker, 1998; Collins & Laursen, 2004). This investigation will examine the role friendship characteristics and adolescents' perceptions of maternal relationships may play as risk and protective factors, respectively, in the process of friend influence.

Friends as a risk factor. Because friends model and reinforce values and behaviors in one another, when one partner in a friendship is more deviant than another the non-deviant partner is at risk for developing the deviant behavior. For example, studies on adolescent drug use repeatedly suggest that the strongest correlate of substance abuse (tobacco, alcohol, and marijuana) is affiliation with substance-abusing peers (Dishion, Capaldi, Spracklen, & Li, 1995). This was also seen in a number of studies reviewed herein, when adolescents' substance use changed to become more similar to the use of their friends (e.g., Chassin et al., 1986; Urberg et al., 1997; Jaccard et al., 2005; Bot et al, 2005).

Mother-adolescent relationships as a protective factor. The quality of the adolescent-parent relationship plays an important role in adolescent socialization, exerting both direct and indirect effects on influences outside the family (Laursen & Collins, 2009).

Research has shown that good quality mother-child relationships during adolescence are directly associated with fewer risky sexual behaviors (Crosby & Miller, 2004; Deptula, Henry, & Schoeny, 2010), lower marijuana use (Penning & Barnes, 1982), fewer internalizing and externalizing problems (Fanti, Henrich, Brookmeyer, & Kuperminc, 2008), higher self-esteem (Laursen, Furman, & Mooney, 2006), lower depression (Connell & Dishion, 2008), and, of greater interest for the present investigation, lower school dropout (Caterall, 1998).

Research also suggests that adolescents' relations with parents have indirect effects on their adjustment. Grolnick, Kurowski, and Gurland (1999) proposed that

good maternal relationships serve as a protective factor against school failure in adolescence by building and supporting motivational resources such as perceived competence, perceived control, and self-regulation. A six-year longitudinal study involving children of divorced mothers (McClain, Wolchik, Winslow, Tein, Sandler, & Millsap, 2010) demonstrated indirect effects of maternal relations in a developmental cascade during mid to late adolescence, where increases in mother-child relationship quality were related to prospective decreases in internalizing problems, which was subsequently related to increases in self-esteem and further reduction in internalizing symptoms. Concomitant with increased relationship quality, there was an increase in effective maternal discipline and subsequent decreases in externalizing problems, substance abuse, and better academic performance.

Two studies introduced previously demonstrated how relationships with parents might buffer negative friend influence. Jaccard et al. (2005) reported that an adolescent's satisfaction with his or her maternal relationship moderated friend influence effects on binge drinking such that an adolescent's friend's binge drinking predicted an increase in the adolescent's binge drinking only when the adolescent was dissatisfied with his or her relationship with his or her mother. Thus, satisfaction with the maternal relationship buffered adolescents against negative friend influence. Similarly, Vitaro et al. (2000) reported that parental attachment moderated the relationship between best friend deviancy and adolescents' subsequent delinquent behaviors. Best friends' deviancy predicted subsequent delinquent behaviors only when attachment to parents was low. Best friends' influence was buffered, that is significant

effects disappeared, when parental attachment was high. In the present investigation, the adolescent's perception of maternal affection is expected to positively affect the influence process within a friendship, buffering the adolescent from negative friend influence on school engagement.

School Adjustment during Adolescence

The critical developmental period of adolescence is marked by school transitions. In early adolescence, children typically move from elementary school to middle school. During mid adolescence, children then move into senior high (or upper secondary) schools, where academic performance determines future educational opportunities. These transitions lead some youth to a downward spiral of academic failure and ultimately school dropout (Eccles, Midgley, Wigfield, Buchanan, Reuman, Flanagan, & Mac Iver, 1993). More specifically, for some adolescents the transitional period of adolescence is associated with declining interest in school (Epstein & McPartland, 1976), truancy (Rosenbaum, 1976; Eccles, Midgley, & Adler, 1984), declining school grades and subsequent school dropout (Simmons & Blyth, 1987). In addition to the obvious life-course disadvantages resulting from the school dropout extreme, school maladjustment is associated with a host of other adjustment difficulties, including depression (Ward, Sylva, & Gresham, 2010), lower self-esteem (Harter, 1996), internalizing and externalizing problems (Jessor, 1991), and negative affect (Cole, Peeke, Dolezal, Murray, & Canzoniero, 1999). Two independent indicators of school adjustment are *school engagement* and *school burnout*.

School engagement. In the literature, school engagement takes on a number of different conceptual definitions with differing behavioral, affective, and cognitive components (for a review see Fredricks, Blumenfeld, & Paris, 2004). For purposes of the present investigation, school engagement refers to a positive affective-motivational academic-related state of mind that is characterized by vigor, dedication, and absorption in studies (Schaufelli, Martinez, Pinto, Salanova, & Bakker, 2002). In this sense, school engagement is a persistent and pervasive cognitive state that is not focused on an individual object, person, event, or behavior. Given this definition, school engagement has been concurrently (Schaufelli et al., 2002) and prospectively (Vasalampi, Salmela-Aro, & Nurmi, 2009) linked with academic success in upper secondary school and university students. Causal links were further demonstrated in a large coed sample of undergraduate students at a Spanish university (Salanova, Schaufeli, Martínez, & Bresó, 2010), where school engagement fully mediated the effects of risk factors (items dealing with lack of social support) and protective factors (items dealing with social support) on academic performance. Protective factors predicted increased engagement, which in turn predicted better future academic performance. Risk factors, on the other hand, predicted future academic performance through an inverse association with school engagement. That school engagement functions as a mediator in this fashion suggests that school engagement is a somewhat malleable predictor of subsequent school performance, sensitive to various risk and protective factors. Whether through direct effects, or as a mediator of other variables, school engagement is an important ingredient for future academic success. Identifying specific factors that affect school

engagement may enable educators to promote school engagement in ways that facilitate better academic outcomes. School burnout is one potential marker of prospective problems with school engagement.

School burnout. School burnout is a relatively new concept that grew out of the literature on burnout in the workplace. Given that school is the context in which children work to achieve academic success, school-related burnout is a useful construct to explore academic adjustment (Schaufeli et al., 2002). School burnout comprises three dimensions: exhaustion at school, a sense of inadequacy at school, and cynicism toward the meaning of school (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009). Although these three dimensions overlap somewhat with other concepts, it is important to note that school burnout is context specific; it is measured strictly in the context of school. For example, the dimension of exhaustion is measured in terms of feeling overwhelmed and chronically fatigued by overtaxing schoolwork. Exhaustion resembles the concepts of stress, tiredness, and anxiety. The dimension of cynicism, which is measured in terms of loss of interest and apathy towards school, resembles depressive symptoms. The dimension of inadequacy as a student also resembles some aspects of depression. Finnish youth report that ten to fifteen percent of 14- to 16-year-olds suffer from school burnout (Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008). School burnout is inversely associated with school engagement and academic achievement (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009). School burnout also predicts subsequent depression, but not vice versa (Salmela-Aro, Savolainen, & Holopainen, 2009).

Although school burnout is closely related to depression, they are not redundant; each is uniquely and significantly linked to academic achievement (Salmela-Aro, Savolainen, & Holopainen, 2009). Perhaps the most important distinction between school burnout and depression is that school burnout symptoms are context specific (Bakker, Schaufeli, Demerouti, Janssen, Van der Hulst, & Brouwer, 2000), whereas depressive symptoms are not. More specifically, depression refers to a global cognitive-affective state, while school burnout refers directly to matters involving school. But given that depression shares some overlapping qualities with school burnout, any investigation into how school burnout is related to school engagement should take measures to ensure that depression is not responsible for any effects that emerge.

Why might school burnout be important in friend influence on school engagement? The contagion hypothesis suggests that friends influence one another's depressive symptoms and depressive attributional styles during interaction. This was demonstrated in a longitudinal study involving 6th through 8th graders, when friends' depressive symptoms at time one predicted participants' level of depressive symptoms and depressive attributional styles 11 months later (Stevens & Prinstein, 2005). When friendships were reciprocated, friends' time one depressive attributional styles also prospectively influenced participants' depressive attributional styles. One process by which this may transpire is *co-rumination*, the process of extensively discussing, rehashing, and speculating about problems with a friend, thus perpetuating focus on the negative state (Rose, 2002). Taken together the features of contagion and co-rumination give rise to the possibility that within a close friendship, the partner with higher levels

of school burnout will dwell on matters relating to the negative school burnout state in discourse with his or her friend, and thus exert greater influence within the relationship on matters pertaining to school.

Research Involving Friend Influence on School Engagement

A literature review did not uncover any studies involving friend influence on school engagement. Moreover, there is a paucity of studies centering on friend influence in *any* area of school adjustment. In one study, Epstein (1983) demonstrated friends' influence on school achievement, using a sample of 5th, 6th, 8th, and 11th grade students and two measurements approximately one year apart. Epstein used regression analyses so that influence effects could be separated from selection effects and the participants' time one scores could be controlled. Participants were asked to name three best friends in the same grade level of their school. Self-report data were available for the participant and named friends on the outcome variables investigated. Scores for all friends named were averaged on each measure. Participants' friends' measures at time one predicted participants' time two measures for English achievement test grades, English report card grades, self-reliance, and college plans. Epstein also investigated whether friends' influence on school achievement, suggested by comparing mean differences between friends on each outcome variable at the two time points, varies as a function of whether friends are relatively lower or higher on the outcome variable being considered. Each participant was assigned to one of four friendship groups, according to the participant's and the friends' relative scores on the outcome variable at time one. Participants who had friends with relatively higher academic achievement were

positively influenced, while participants who had friends with relatively lower academic achievement were negatively influenced. But given the structure of these mean-level analyses, bidirectional influence effects could not be assessed, nor could participants' initial levels of achievement be controlled for when evaluating differences between time one and time two scores. Even though Epstein investigated the influence of a group of friends, and not influence due to dyadic friend interaction, this study is important because it was another early attempt to discern how individual characteristics might affect the influence process. It is, however, also important to note that because friends' data could be considered in the analyses many times in this study design, as a named friend for multiple participants and again as a participant, statistical results are compromised due to unequal representation of participants in the sample.

In a second study, friends' influence on adolescents' academic achievement motivation was demonstrated in an experiment (Berndt, Laychak, & Park, 1990) in which adolescents predicted how they would behave in six hypothetical dilemmas involving school responsibilities, both before and after discussions with a close friend. One such dilemma read:

One of the most popular rock groups is coming to town to give one performance. You have eagerly awaited their visit and have already purchased your ticket. Then you learn that the concert is on the night before a big exam. You don't really feel prepared for the exam and you have been having difficulty with the subject. Because of other commitments, this night will be the only time that you can study. If you don't take this time to study, you could get a low

grade on the exam, but this may be the only opportunity to see one of your favorite groups in concert. You must decide whether to go to the concert or to stay home and study (pp. 665-666).

Friends were matched when they nominated one another among their top five same-sex, same-grade, closest friends and rated each other as a 4 or 5 on a 5-point liking scale (1=don't like, 5=like very much). In the experimental condition, discussion with a friend centered on the dilemma and the friends were asked to come to a joint decision on the dilemma. In the control condition, discussion centered on topics that were not dilemma or school related. Friends' opinions of how they would behave in the motivation-related dilemmas were more similar after discussion than they were before discussion for the experimental group, but not for the control group, suggesting that discussion between friends increases similarity.

A third study demonstrated that friends also influence school involvement and classroom behaviors (Berndt & Keefe, 1995). Measures were taken in the fall and spring from 297 7th and 8th grade students in three public schools. Participants nominated up to three best friends. The first friend named was considered the very best friend (reciprocation was not required). Participant, teacher, and friend reports (for the 68% of participants who nominated friends that were participating in the study) were available for measures of school involvement and disruptive classroom behaviors. Changes in school involvement between time one and time two were predicted by best friends' school involvement at time one in regression analyses using participants' perceptions of their best friend's school involvement, but not when considering friend

or teacher reports. Changes in disruptive classroom behaviors were predicted by best friends' time one disruptive behaviors in regression analyses using either participant or friend reports of friend disruptive behaviors, but not using teacher-rated disruption. Berndt and Keefe also demonstrated that characteristics of the friendship affect the influence process. Participants rated positive and negative features of each friendship, which were used as predictors in regression analyses. Time one perceptions of positive features of the best friendship predicted time two school involvement. Time one perceptions of negative features of the best friendship predicted time two classroom disruption. When positive and negative features were jointly considered, results suggested that classroom disruption was greatest when both positive and negative features of the friendship were high.

These studies demonstrate that friends influence academic adjustment, and further suggest that characteristics of the friendship and characteristics of the individual affect the influence process. Until recently, statistical techniques used to investigate friend influence were not conducive to identifying more about *who influences whom* within the relationship. Moreover, conventional methods of analysis are not designed to consider the nonindependent nature of data collected on friends; regression analysis assumes nonindependence which, as previously pointed out, is a shortcoming of many previous studies. The present investigation intends to use a novel statistical technique that considers the nonindependent nature of dyadic data, and further enables the members of friendship dyads to be distinguished based on individual characteristics that may affect the influence process.

A Model for Studying Dyadic Peer Influence: The Actor-Partner Interdependence Model

When data are nonindependent (as is usually the case with friends), the assumption of independence for traditional methods of analysis is violated, resulting in biased estimation; the dyad should be the unit of analysis in this case, not the individual. The Actor-Partner Interdependence Model (APIM: Kenny, Kashy, & Cook, 2006) was designed for use with nonindependent dyadic data.

The longitudinal APIM design is presented in Figure 1. Paths A1 and A2 are the *actor effect* paths (reflecting each actor's time one effect on his own time two behavior). Paths P1 and P2 are the *partner effect* paths (reflecting each actor's time one effect on his partner's time two behavior). There are two distinct APIM designs, one for *exchangeable* dyads and one for *distinguishable* dyads.

APIM for exchangeable dyads. The APIM for exchangeable dyads is used when dyad members are not distinguished on some theoretically and statistically meaningful basis. For example, father-daughter dyads are easily distinguished by sex. When same-sex friends are investigated in a design that does not distinguish friends in a theoretically meaningful way, the dyads are considered exchangeable. Data for exchangeable dyads require special methodological consideration. By way of example, consider trying to calculate a simple product moment correlation to measure the relationship between the weight of husbands and wives. Given this example, husband and wife can be distinguished and we enter the weights of each husband and wife pair into a separate row of our data set, always assigning the wife to the variable X position

and the husband to the variable Y position. An interpretable correlation will result because the wife (always X) and husband (always Y) are distinguishable. Consider now a pair of same-sex friends that are not distinguishable on any weight-based theoretical basis. Entering one friend's weight arbitrarily as the X variable and the other's as the Y variable will not result in a correlation that reflects the true association between friends on weight. Should you switch positions of any two friends (moving the friend in the arbitrary X position to the arbitrary Y position and vice versa), the resulting correlation will change. Griffin and Gonzalez (1995) proposed the data double-entry method to attenuate this problem and the APIM for the exchangeable case employs the same method. As the name implies, each dyad is entered into the data set twice, so that each member of the dyad can occupy both the X and Y positions (not arbitrarily one or the other). As a result of using the data double-entry method for the exchangeable case to estimate the APIM, the beta weights for the two actor effect paths will be the same (i.e., paths A1 and A2 will not differ), as will the partner effect paths (P1 and P2). As a result, the question of whether dyad members are influenced by their own prior behavior (actor effects) or the prior behavior of their partner (partner effects) can be addressed, but who influences whom is not discernable. The present investigation will use the APIM for exchangeable dyads to investigate the basic question of whether friends influence one another on school engagement.

APIM for distinguishable dyads. When partners within a friendship dyad are distinguished on some theoretically and statistically meaningful basis, an APIM for distinguishable dyads can be estimated. There is no need to double enter the data, and

when the APIM is estimated, each dyad member's individual effects on the other is discernable. Turning again to Figure 1, when dyads are distinguished, the P1 path will reflect the effects of Partner 1's time one score on Partner 2's time two score, and the P2 path reflects effects of Partner 2's time one score on Partner 1's time two score (i.e., P1 and P2 beta weights are unique).

Laursen, Popp, Burk, Kerr, and Stattin (2008) were the first to propose the longitudinal APIM for distinguishable dyads as a model for studying friend influence. Given friendship dyads that can be distinguished on some theoretically meaningful characteristic, it is possible to learn more about *who influences whom* within a friendship. As discussed previously, Popp et al. demonstrated that the relatively older member of a friendship dyad is more influential than the younger member of the dyad and Laursen, Hafen, Burk, Kerr, and Stattin (in press) demonstrated that the member of a friendship dyad who is more accepted by peers exerts greater influence in the relationship than does his less-accepted friend. This investigation will distinguish dyad members on their relative levels of school burnout to examine friend influence on school engagement.

The Present Investigation: Research Objectives and Summary of Hypotheses

This investigation will enhance existing knowledge about friend influence in at least four ways. First, the study design will remedy shortcomings found in previous research on friend influence: (1) measurements for both adolescents and their friends will be used, (2) longitudinal analyses will facilitate distinguishing influence effects from selection effects, (3) adolescents' time one behavior will be controlled so that

friend influence will not be conflated by adolescents' own tendencies or prior influence on the variable of interest, (4) adolescents will be included in only one friendship dyad so results will not be biased due to unequal representation of participants in the sample, and (5) only stable friendships will be considered so that results will not be confounded by effects of other events that may be transpiring in unstable relationships or by evaluating only very brief periods of exposure to influence. Second, unlike traditional statistical designs that assume independent data, the APIM design used for this investigation will accommodate the nonindependent nature of data collected on friends. Third, the important but largely ignored construct of school engagement will be examined as an outcome variable. Finally, the protective effects of the mother-adolescent relationship on risks associated with negative friend influence will be investigated.

This study will examine whether friends influence one another's level of school engagement, whether influence on school engagement differs as a function of each partners' relative level of school burnout, and whether patterns of friend influence on school engagement are moderated by the mother-adolescent relationship. Four hypotheses are offered.

Do friends influence one another on school engagement? Because empirical evidence suggests that friends prospectively influence each other in a number of areas, including school adjustment (Berndt & Keefe, 1995; Berndt, Laychak, & Park, 1990; Epstein, 1983), it is hypothesized that a friend's initial level of school engagement will predict his or her partner's future school engagement (*hypothesis 1*).

Do friends' relative levels of school burnout affect the degree of influence each partner exerts over the other? School burnout is a negative state. Adolescents tend to co-ruminate (or self-disclose about negative topics) with their friends. Co-rumination results in dyadic focus on, and perpetuation of, the negative state, as well as influence between co-ruminating partners on matters involving the negative state (Rose, 2002). As a result, it is expected that influence of the higher burnout partner will be a risk factor for the lower burnout partner's school engagement. In other words, the intradyadic influence of the higher burnout partner on the lower burnout partner's school engagement will be stronger than the influence of the lower burnout partner on the higher burnout partner's school engagement (*hypothesis 2*).

Do adolescents' perceptions of relationships with mothers buffer the effects of friend influence on school engagement? Given research demonstrating that the mother-adolescent relationship serves as a protective factor against a number of risk behaviors, including school engagement (Grolnick et al., 1999; McClain et al., 2010) and further that the mother-adolescent relationship buffers the risk of negative peer influence on binge drinking (Jaccard et al., 2005) and delinquency (Vitaro et al., 2000), it is predicted that adolescents' perceptions of maternal affection will moderate patterns of friend influence. More specifically, it is expected that influence of the relatively higher burnout partner on the relatively lower burnout partner's school engagement will not be significant when the lower burnout partner's perception of maternal affection is high, but will be significant when the lower burnout partner's perception of maternal affection is low (*hypothesis 3*).

Is depression responsible for variations in patterns of friend influence on school engagement attributed to relative levels of school burnout? Although depression contributes to school burnout, school burnout captures other processes that are distinct from depression (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009; Salmela-Aro, Savolainen, & Holopainen, 2009). It is therefore predicted that the patterns of influence proffered in hypotheses 2 and 3 will hold when each partner's level of depression is controlled (*hypothesis 4*). In other words, after controlling for depression, the higher burnout partner should still influence the lower burnout partner's school engagement, but only when the lower burnout partner's perception of maternal affection is low.

METHOD

Participants

The participants included 320 adolescents (188 girls and 132 boys) in the first year of secondary level education from five senior high schools and four vocational schools in a small city in central Finland (population 88,000). The median age of targeted participants was 17 ($M = 17.2$, $SD = 1.07$) at the outset. The sample is homogeneous in cultural background, consistent with the Finnish school system in general (Vasalampi, Salmela-Aro, & Nurmi, 2009). The mother-tongue for all but one participant (99.7%) was Finnish. Of the 320 participants, 186 (58.1%) attended senior high schools and 134 (41.9%) attended vocational schools. One hundred sixty-five (51.6%) lived with both biological parents, 64 (20%) lived with one biological parent, 27 (8.4%) lived with a biological parent and a step-parent or significant other, and 64 (20%) had other living arrangements.

Participants were drawn from the Finnish Educational Transitions (FinEdu) project, an ongoing longitudinal study of all 9th grade students from nine schools (49 classes). In Finland, all children have a similar basic education through 9th grade in comprehensive school (about age 16), after which educational paths diverge. Approximately 55% of adolescents enter senior high schools, 37% enter vocational schools, 2% stay in comprehensive school for a voluntary 10th grade, and 6% exit formal education (*School Statistics*, Central Statistical Office of Finland, 2003). Senior

high school education is prerequisite for university education whereas vocational schools lead directly to occupational employment.

The total FinEdu sample consisted of 1,494 adolescents in 13 secondary level education schools: six senior high schools, five vocational schools, and two 10th grade classes in different comprehensive schools. Of these, 818 students were followed from 9th grade in comprehensive school and 676 participants were new to the study in the first year of secondary level education. The participation rate was 84%.

Of the 1,494 adolescents participating during the first year of secondary level education, 1,177 also participated during the second year of secondary level education. One-way ANOVAs were used to determine if there were significant differences between adolescents who participated at both times and those who only participated during the first year of secondary level education on school engagement, school burnout, depression, and perception of maternal affection. Adolescents who participated at both time points reported lower school burnout ($M=2.35$, $SD=.88$) than adolescents who only participated during the first year of secondary level education ($M=2.50$, $SD=.94$), $F(1, 1392)=6.15$, $p < .01$ (Eta = .004). Adolescents who participated at both time points also reported lower depression ($M=1.54$, $SD=.56$) than adolescents who only participated during the first year of secondary level education ($M=1.66$, $SD=.63$), $F(1, 1415)=10.72$, $p < .01$ (Eta = .008). There were no statistically significant differences between the 1,177 adolescents who participated at both time points and the 317 adolescents that participated during the first, but not the second, year of secondary level education on school engagement or perceptions of maternal affection.

Of the 1,177 adolescents who participated in the study during both the first and second year of secondary level education, 320 had reciprocal stable friendships, and 857 did not. Mixed-design ANOVAs were used to determine if there were statistically significant differences between measurement times or friendship status on school engagement, school burnout, and depression. School engagement was lower during the second year of secondary level education ($M = 3.60, SD = 1.30$) than during the first year of secondary level education ($M = 3.79, SD = 1.24$), $F(1, 992) = 15.12, p < .05$ (Eta = .023). School burnout was higher during the second year of secondary level education ($M = 2.54, SD = .95$) than during the first year of secondary level education ($M = 2.34, SD = .86$), $F(1, 985) = 15.24, p < .05$ (Eta = .039). There were no main effects for depression or interactions among any study variables. A one-way ANOVA determined that there was not a significant difference between adolescents who had reciprocal stable friendships and those who did not on perceptions of maternal affection (measurements for perception of maternal affection were not taken during the second year of secondary level education).

Finally, of the 320 adolescents with stable reciprocal friendships, 186 attended senior high schools and 134 attended vocational schools. ANOVAs were used to determine if there were significant differences between adolescents who attended senior high schools and those who attended vocational schools on school engagement, school burnout, depression, and perception of maternal affection. Adolescents attending senior high schools reported higher school burnout ($M = 2.44, SD = .86$) at time one than adolescents attending vocational schools ($M = 2.18, SD = .81$), $F(1, 315) = 7.131, p <$

.05 (Eta = .022). Adolescents attending senior high schools also perceived greater maternal affection ($M = 5.73$, $SD = .97$) than adolescents attending vocational schools ($M = 5.24$, $SD = 1.25$), $F(1, 317) = 15.44$, $p < .05$ (Eta = .047). There was no difference between adolescents attending senior high schools and adolescents attending vocational schools on depression or school engagement at time one or time two.

Within-Dyad Distinction of Friends Based on Relative Levels of School Burnout

Dyad members were distinguished based on their relative levels of school burnout (a within-dyad distinction), to test whether partners' relative level of school burnout affects patterns of influence between friends. The member of each dyad with the higher burnout score was designated the high burnout partner and the other member of the dyad (with the lower relative score) was designated the low burnout partner.

Dyads whose members' school burnout scores were within .25 standard deviations of one another were excluded from analysis ($n = 33$).

Grouping Friendship Dyads Based on Low/High Maternal Affection

Dyads were grouped based on perceptions of maternal affection (a between-dyad distinction), to test whether maternal affection protected against (moderated) negative friend influence. Two separate analyses were conducted, one based on the low burnout partner's perception of maternal affection and another based on the high burnout partner's perception of maternal affection. First, the dyads were divided into two groups on the basis of the low burnout partner's perception of maternal affection: low maternal affection ($< .125$ standard deviations below the mean; $n = 46$) or high maternal affection ($> .125$ standard deviations above the mean; $n = 66$). Dyads whose

low burnout partner's perceived maternal affection was within .125 standard deviations of the mean were excluded from analysis ($n = 15$). Next, the dyads were divided into two groups on the basis of the high burnout partner's perception of maternal affection: low maternal affection ($< .125$ standard deviations below the mean $n = 49$) or high maternal affection ($> .125$ standard deviations above the mean; $n = 64$). Dyads whose high burnout partner's perceived maternal affection was within .125 standard deviations of the mean were excluded from analysis ($n = 14$).

Instruments

Stable friendships. During each year of data collection, adolescents were asked to name three same-grade classmates "whom they like to spend time with the most." Stable same-sex friendships were identified when two same-sex participants nominated one another (i.e., reciprocal nominations) in both the first and second year of upper secondary school, but neither nominated the other in the last year of comprehensive school. Participants were restricted to a single friendship. If a participant had multiple reciprocal same-sex friendships, the nomination rank sum was calculated for each friendship and the highest ranked friendship was selected; in the event of a tie, preference was given to friendships that resulted in eliminating the fewest participants from the sample.

School engagement. School engagement was measured in both the first and second year of secondary level education with a 9-item inventory (e.g., "*I am enthusiastic about my studies*"; "*My studies inspire me*") (Salmela-Aro, 2002b; Schaufeli, Martínez, Pinto, Salanova, & Bakker, 2002). See Appendix A. Items were

rated on a scale ranging from 1 (*never*) to 6 (*every day*). Items were averaged. Internal reliability was high ($\alpha = .93$ to $.94$).

School burnout. School burnout was assessed in both the first and second year of secondary level education with the School Burnout Inventory (*SBI-10*, Salmela-Aro & Näätänen, 2005), a 10-item inventory (e.g., “*I feel I am drowning in school work*”; “*I feel I am losing my interest toward school*”). See Appendix B. Items were rated on a scale ranging from 1 (*completely disagree*) to 6 (*completely agree*). Items were averaged. Internal reliability was good ($\alpha = .87$ to $.89$).

Depression. Depressive symptoms were measured in both the first and second year of secondary level education with the 10-item (e.g., “*I felt myself sad*”; “*I did not enjoy my life*”) DEPS depression scale (Salokangas, Stengård, & Poutanen, 1994). See Appendix C. Items were rated on a scale ranging from 1 (*not at all*) to 4 (*very much*). Items were averaged. Internal reliability was high ($\alpha = .90$ to $.91$).

Adolescent perceptions of maternal affection. Adolescents’ relationships with their mothers were assessed in the first year of secondary level education with scales developed by Roberts, Block, and Block (1984), and revised by Nurmi and Salmela-Aro (2003) and Aunola and Nurmi (2004). Twenty-one items form four subscales. See Appendix D. One subscale is of interest in the present investigation (items in Appendix in bold font). *Maternal affection* includes nine items (e.g. “*My mother often shows me how much she appreciates the fact that I try to do or achieve something*”; “*My mother respects my opinion*”) that were rated on a scale ranging from 1 (*not at all*) to 7 (*completely*). Items were averaged. Internal reliability was high ($\alpha = .92$).

Procedure

Pursuant to Finnish law and under guidance and approval of school officials, passive consent procedures were employed. Parents were notified of the study and could withdraw their child from study participation at any time. Students were informed that they could refuse study participation at any time.

School personnel were trained on questionnaire administration procedures prior to administering the study. Administrators read questionnaire directions aloud to participants and remained in the classroom to answer questions during data collection sessions. Questionnaires were completed by participants during regular school hours and returned in sealed envelopes. Participants were assured that their questionnaire responses would remain confidential, and would not be viewed by teachers or parents. Incentives for participation included registration in a raffle for movie tickets.

Missing Data

Little's MCAR test (Little, 1988) revealed that data were missing completely at random, $\chi^2(2846) = 2954.25, p > .05$. The number of participants without school engagement or time two school burnout data was small ($n = 12$; 3.8%); the full information maximum likelihood (FIML) estimation method was applied to these missing data. Participants without time one school burnout data (4 participants) or maternal affection data (2 participants) were omitted from analyses requiring these data because they are intradyadic distinguishing or interdyadic grouping variables, respectively, and thus could not be subjected to FIML estimation as direct measurement variables in the AMOS models.

Plan of Analysis

Confirmatory factor analysis. A CFA with promax rotation was conducted to verify items used to construct the factor for adolescents' perception of maternal affection (see Appendix D; bold items comprise the original maternal affection scale).

Sample description. Two (low/high school burnout distinction) by two (time one/time two) ANOVAs were used to describe variable means and identify mean-level differences for school engagement, school burnout, and depression. A one-way ANOVA was used to identify intradyadic mean-level differences in perceptions of maternal affection. Interclass correlations assessed associations among study variables, both separately for low and high burnout partners and for the total sample.

Intraclass correlations. Intraclass correlations established friends' interdependence (similarity) on school engagement, a prerequisite to dyadic data analyses, and determined whether friends became more similar over time.

Test of distinguishability. After friends were distinguished based on relative levels of school burnout, a chi-square (χ^2) test of distinguishability (Kenny et al., 2006) confirmed the suitability of distinguishable dyadic analyses. In this omnibus test of distinguishability, variances, interpersonal correlations, and intrapersonal correlations are constrained to be equal (see Figure 2). A significant χ^2 test ($p < .05$) confirms that friends can be distinguished on the basis of relative school burnout.

Dyadic analyses. Dyadic analyses describe patterns of friend influence on school engagement within stable friendships. APIM multiple group longitudinal models were estimated using AMOS version 17.0 (Arbuckle, 2008). Model fits were assessed

with three fit indices. The first is the chi-square (χ^2) statistic, which directly compares the proposed model to the data. A non-significant χ^2 test is ideal (indicating that the covariance matrix from the proposed model is not significantly different from the covariance estimated directly from the data), but is rarely obtained. The *normed chi-square* (NC) provides a guideline for accepting a model with a significant χ^2 test. To calculate the NC, χ^2 is divided by its degrees of freedom. NC values of 2.0, 3.0, and even 5.0 have been recommended as indicating reasonable fit (Kline, 2005). The second fit assessment is the Comparative Fit Index (CFI; Bentler, 1990), which compares how well the data fit the proposed model to how well the data fit a simpler model (i.e., one in which no paths are estimated). The CFI statistic ranges from 0 to 1, with values exceeding .90 indicating an adequate model fit (increasing fit quality is indicated as the statistic approaches 1.0). The third fit assessment is the Root Mean Square Error of Approximation (RMSEA; Steiger & Lind, 1980). Good models have a RMSEA value of .05 or less; a RMSEA value between .05 and .10 indicates adequate fit; a RMSEA value greater than .10 indicates a poor model fit. Re-fitting the model with non-significant paths trimmed is recommended, when theoretically reasonable, to find a parsimonious model that fits the data (Kline, 2005). To this end, non-significant time two covariance paths were trimmed. Time one covariance paths were not trimmed because they are required to control for selection effects in the model. Paths between time one and time two were not trimmed because they are theoretically and empirically relevant.

Exchangeable dyadic analyses. To test the hypothesis that friends influence one another's school engagement, the model depicted in Figure 1 was estimated using

friends' time one and time two scores on school engagement. Because friends were not distinguished in this analysis, the APIM method for exchangeable cases was used.

Friend influence is demonstrated when path P1/P2 (identical in exchangeable cases) is significant.

Distinguishable dyadic analyses. To test whether the higher burnout partner's influence on the lower burnout partner's school engagement is stronger than the lower burnout partner's influence on the higher burnout partner's school engagement (hypothesis 2), the model depicted in Figure 1 was estimated using the APIM method for distinguishable dyads. Friend influence is indicated by a significant beta weight for a partner path (*P1* and/or *P2*). Chi-square difference tests contrast the two partner paths (*P1* and *P2*). The hypothesis is confirmed if the beta weight for path *P2* is larger than the beta weight for path *P1*, and the Chi-square difference test contrasting these two paths is significant ($p < .05$).

To test whether an adolescent's perception of maternal affection buffers the risk of negative friend influence (hypothesis 3), the AMOS multiple group models depicted in Figure 3 and Figure 4 were conducted. First, dyads were grouped based on the low burnout partner's perception of maternal affection (see Figure 3). Chi-square difference tests determine whether differences between groups on influence paths (*P1a* and *P1b* or *P2a* and *P2b*) are significant. Hypothesis 3 is confirmed if the path between the high burnout partner's time one school engagement and the low burnout partner's time two school engagement is significant when the low burnout partner's perception of maternal affection is low (path *P2a*), but loses magnitude when the low burnout partner's

perception of maternal affection is high (path *P2b*). Chi-square difference tests are conducted to determine differences between the low and high affection groups on this path.

Dyads were also grouped on the basis of the high burnout partner's perception of maternal affection (see Figure 4). If hypothesis 2 is correct, the high burnout partner should not be influenced, so there is no risk for maternal affection to buffer. No moderating effects of maternal affection are anticipated for the high burnout partner's perception of maternal affection.

To test the prediction that patterns of influence hold when controlling for each partner's level of depression (hypothesis 4), the multiple group models also include depression as a control variable (see Figure 5 and Figure 6).

RESULTS

Preliminary Analyses

Confirmatory factor analysis. The 21 items from the parental relations questionnaire (Aunola & Nurmi, 2004; Nurmi & Salmela-Aro, 2003; Roberts et al., 1974) were subjected to maximum likelihood factor analysis with promax rotation using PASW version 18. Analysis confirmed four components with eigenvalues exceeding 1, explaining 33.0%, 18.9%, 6.0%, and 5.3% of the variance, respectively. Inspection of the screeplot revealed a clear break after the fourth component. This study is concerned with the first component which was confirmed to comprise 9-items focused on the adolescent's perception of maternal affection. When factor analysis was conducted using principal components extraction rather than maximum likelihood, or using varimax orthogonal rotation in lieu of promax oblique rotation, the same 4-factor solution emerged, with the same 9-item factor concerning adolescent's perception of maternal affection. A confirmatory factor analysis in AMOS 17.0 also suggested the 4-factor structure with a marginal model fit ($\chi^2_{(183)} = 1489.37, p < .05$; NC = 8.1; CFI = .90; RMSEA = .07). Table 1 describes factor loadings for the 9-item factor for adolescent's perception of maternal affection.

Sample means and mean level differences. Means and standard deviations for study variables are described in Table 2, separately for low and high burnout partners and for the total sample. Repeated-measures 2 x 2 design ANOVAs were used to detect

intradynamic and time mean-level differences in school engagement, depression, and school burnout. High burnout partners reported lower school engagement ($M = 3.59$, $SD = 1.15$) than low burnout partners ($M = 3.93$; $SD = 1.23$), $F(1, 246) = 5.96$, $p < .05$ (Eta .024). School engagement was higher at time one ($M = 3.89$; $SD = 1.20$) than at time two ($M = 3.63$; $SD = 1.19$), $F(1, 246) = 15.89$, $p < .05$ (Eta .061). High burnout partners reported higher depression ($M = 1.70$, $SD = .57$) than low burnout partners ($M = 1.40$; $SD = .44$), $F(1, 252) = 26.30$, $p < .05$ (Eta .094). High burnout partners reported higher school burnout ($M = 2.86$, $SD = .80$) than low burnout partners ($M = 2.09$; $SD = .72$), $F(1, 246) = 81.17$, $p < .05$ (Eta .248). School burnout was lower at time one ($M = 2.41$; $SD = .87$) than at time two ($M = 2.55$; $SD = .87$), $F(1, 246) = 9.91$, $p < .05$ (Eta .039). But there was a significant time x school burnout interaction, $F(1, 246) = 35.87$, $p < .05$ (Eta .127). Low burnout partners' school burnout scores increased from time one ($M = 1.87$; $SD = .61$) to time two ($M = 2.30$; $SD = .83$), while high burnout partners' school burnout scores decreased from time one ($M = 2.92$; $SD = .76$) to time two ($M = 2.79$; $SD = .84$). A one-way ANOVA detected intradyadic differences in perceptions of maternal affection, $F(1, 251) = 10.22$, $p < .05$ (Eta .039), with low burnout partners perceiving higher maternal affection ($M = 5.76$; $SD = 1.04$) than high burnout partners ($M = 5.32$; $SD = 1.16$). There were no other main effects or interactions.

Intercorrelations among study variables. Bivariate correlations of study variables are presented for the total sample in Table 3. Bivariate correlations for low

and high burnout partners are presented separately in Table 4. Most study variables are significantly intercorrelated.

Intraclass correlations. Intraclass correlations determined that friends were similar on school engagement during the first year of friendship (at time one), $r = .18, p < .01$, and during the second year of friendship (at time two), $r = .38, p < .001$. The increase in similarity suggests friend influence over time.

The significant intraclass correlations for school engagement in the first and second years of secondary level education also indicate interdependence of school engagement measurements taken on friends. Thus the dyad, not the individual, should be the unit of analysis when investigating influence on school engagement between friends.

Test of distinguishability. The chi-square omnibus test of distinguishability confirmed that friends can be distinguished on the basis of relative school burnout, $\chi^2_{(4)} = 28.72, p < .001$.

Dyadic Analyses for the Exchangeable Case

Do friends influence one another on school engagement? The AMOS APIM model for exchangeable dyads was fully saturated, so fit indices could not be estimated. One partner's school engagement at time one was a significant predictor of the other partner's school engagement at time two ($\beta = .10, p < .05$), confirming the first hypothesis that friends influence one another's school engagement.

Dyadic Analyses Distinguishing Friends Based on Relative School Burnout

Do friends' relative levels of school burnout affect the degree of influence each partner exerts over the other? The AMOS APIM model for distinguishable dyads fit the data, $\chi^2_{(10)} = 18.09, p > .05$ (NC = 1.8; CFI = .976; RMSEA = .08, 95% CI [.000, .138]). Trimming non-significant covariances from time two resulted in enhanced model fit, $\chi^2_{(13)} = 19.26, p > .05$ (NC = 1.5; CFI = .98; RMSEA = .06, 95% CI [.000, .116]). Results for the more parsimonious, trimmed model were adopted. The low burnout partner's school engagement at time one did not influence the high burnout partner's time two school engagement ($\beta = .06$), nor did the high burnout partner's time one school engagement influence the low burnout partner's time two school engagement ($\beta = .08$).

Do the low burnout partners' perceptions of relationships with mothers buffer the effects of friend influence on school engagement? The AMOS APIM model distinguishing friends based on relative levels of school burnout was refitted to test whether the low burnout partner's perception of maternal affection moderates patterns of friend influence. Dyads were grouped based on whether the low burnout partner's perception of maternal affection was low (< .125 standard deviations below the mean) or high (> .125 standard deviations above the mean). The multiple-group model depicted in Figure 3 fit the data, $\chi^2_{(20)} = 25.90, p > .05$ (NC = 1.3; CFI = .98; RMSEA = .05, 95% CI [.000, .103]). Trimming non-significant covariances from time two resulted in enhanced model fit, $\chi^2_{(26)} = 31.03, p > .05$ (NC = 1.2; CFI = .98; RMSEA = .04, 95% CI [.000, .090]). Results for the more parsimonious, trimmed model are depicted in Figure 7.

Dyads in which the low burnout partner perceived low maternal affection. The top portion of Figure 7 describes paths of influence when the low burnout partner perceived low maternal affection. In this group, the high burnout partner's school engagement at time one predicted decreases in the low burnout partner's school engagement at time two ($\beta = .25$), but the partner reporting lower school burnout did not influence the partner reporting higher school burnout ($\beta = -.03$). A chi-square difference test confirmed a significant difference between these influence paths, $\chi^2_{(1)} = 5.08, p < .05$. When the low burnout partner perceived low maternal affection, he or she was influenced by the high burnout partner, but the low burnout partner did not influence the high burnout partner. This influence path further supports the first hypothesis that friends influence school engagement, and also provides initial support for the second hypothesis that friends' relative levels of school burnout affect who is influential and who is not.

Dyads in which the low burnout partner perceived high maternal affection. The bottom portion of Figure 7 describes paths of influence when the low burnout partner perceived high maternal affection. In this group, the low burnout partner's school engagement at time one did not influence the high burnout partner's time two school engagement ($\beta = .04$), nor did the high burnout partner's time one school engagement influence the low burnout partner's time two school engagement ($\beta = .01$). A chi-square difference test confirmed that there was not a significant difference between these influence paths, $\chi^2_{(1)} = .04, p > .05$. Neither the high burnout partner nor

the low burnout partner influenced the other when the low burnout partner perceived high maternal affection.

Contrasts between dyads whose low burnout partner perceived low maternal affection and dyads whose low burnout partner perceived high maternal affection. A chi-square difference test confirmed there was not a significant difference in the path of influence from the low burnout partner's time one school engagement to the high burnout partner's time two school engagement, between dyads whose low burnout partners perceived low maternal affection ($\beta = -.03$) and dyads whose low burnout partners perceived high maternal affection ($\beta = .04$), $\chi^2_{(1)} = .16, p > .05$. Whether the low burnout partner perceived high or low maternal affection did not moderate the low burnout partner's (non-significant) path of influence to the high burnout partner.

A chi-square difference test confirmed a statistically significant difference in the prospective path of influence from the high burnout partner's time one school engagement to the low burnout partner's time two school engagement, between dyads whose low burnout partners perceived low maternal affection ($\beta = .25$) and dyads whose low burnout partners perceived high maternal affection ($\beta = .01$), $\chi^2_{(1)} = 4.14, p < .05$. These findings support hypothesis 3: the high burnout partner's influence on the low burnout partner's school engagement was buffered when the low burnout partner's perception of maternal affection was high.

Taken together, the results from the AMOS multiple-group APIM model that distinguished friends based on relative levels of school burnout also support hypothesis 2: friends' relative levels of school burnout affect who influences whom. Given that

influence only emerged on the path between the high burnout partner and the low burnout partner when the low burnout partner's perception of maternal affection was low (i.e., influence was moderated by the perception of maternal affection), these effects were masked in the APIM model for distinguishable dyads that did not include maternal affection as a moderator.

Do patterns of influence hold when controlling for depression? When depression was added to the model as a control variable (see Figure 5) model fit worsened, $\chi^2_{(56)} = 82.75, p < .05$ (NC = 1.5; CFI = .94; RMSEA = .07, 95% CI [.032, .095]), but patterns of influence did not change. Trimming non-significant covariances from time two resulted in enhanced and acceptable model fit, $\chi^2_{(72)} = 93.76, p < .05$ (NC = 1.3; CFI = .95; RMSEA = .05, 95% CI [.010, .080]) and, again, patterns of influence did not change. The trimmed model was adopted.

Dyads in which the low burnout partner perceived low maternal affection. When the low burnout partner perceived low maternal affection, the high burnout partner's time one school engagement predicted decreases in the low burnout partner's time two school engagement ($\beta = .29$), but the partner reporting lower school burnout did not influence the partner reporting higher school burnout ($\beta = -.01$). A chi-square difference test confirmed a significant difference between these paths of influence, $\chi^2_{(1)} = 3.96, p < .05$.

Dyads in which the low burnout partner perceived high maternal affection. When the low burnout partner perceived high maternal affection, neither partner influenced the other (low burnout partner's path of influence $\beta = .04$; high burnout

partner's path of influence $\beta = .00$). There was not a significant difference between these paths of influence, $\chi^2_{(1)} = .07, p > .05$.

Contrasts between dyads whose low burnout partner perceived low maternal affection and dyads whose low burnout partner perceived high maternal affection. A chi-square difference test confirmed there was not a significant difference in the path of influence from the low burnout partner's time one school engagement to the high burnout partner's time two school engagement, between dyads whose low burnout partner perceived low maternal affection ($\beta = -.01$) and dyads whose low burnout partner perceived high maternal affection ($\beta = .04$), $\chi^2_{(1)} = .09, p > .05$.

A chi-square difference test confirmed a statistically significant difference in the prospective path of influence from the high burnout partner's time one school engagement to the low burnout partner's time two school engagement, between dyads whose low burnout partner perceived low maternal affection ($\beta = .29$) and dyads whose low burnout partner perceived high maternal affection ($\beta = .00$), $\chi^2_{(1)} = 5.49, p < .05$.

Do the high burnout partners' perceptions of relationships with mothers buffer the effects of friend influence on school engagement? The AMOS APIM model distinguishing friends based on relative levels of school burnout was refitted to test whether the high burnout partner's perception of maternal affection moderates patterns of friend influence. Dyads were grouped based on whether the high burnout partner's perception of maternal affection was low ($< .125$ standard deviations below the mean) or high ($> .125$ standard deviations above the mean). This multiple group model fit the data, $\chi^2_{(20)} = 27.80, p = > .05$ (NC = 1.4; CFI = .97; RMSEA = .06, 95%

CI [.000, .108]). Trimming non-significant covariances from time two resulted in enhanced model fit, $\chi^2_{(26)} = 31.03$, $p > .05$ (NC = 1.2; CFI = .98; RMSEA = .04, 95% CI [.000, .090]). Results for the more parsimonious, trimmed model are depicted in Figure 8.

Dyads in which the high burnout partner perceived low maternal affection.

The top portion of Figure 8 describes paths of influence when the high burnout partner perceived low maternal affection. Neither partner influenced the other (low burnout partner path of influence $\beta = -.05$; high burnout partner path of influence $\beta = .08$). A chi-square difference test confirmed that there was not a significant difference between these paths of influence, $\chi^2_{(1)} = .65$, $p > .05$.

Dyads in which the high burnout partner perceived high maternal affection.

The bottom portion of Figure 8 describes paths of influence when the high burnout partner perceived high maternal affection. Neither partner influenced the other (low burnout partner path of influence $\beta = .15$; high burnout partner path of influence $\beta = .05$). There was not a significant difference between these paths of influence, $\chi^2_{(1)} = .30$, $p > .05$.

Contrasts between dyads whose high burnout partner perceived low maternal affection and dyads whose high burnout partner perceived high maternal affection.

Chi-square difference tests confirmed there was not a significant difference in the prospective path of influence from the low burnout partner's time one school engagement to the high burnout partner's time two school engagement, between dyads whose high burnout partner perceived low maternal affection ($\beta = -.05$) and dyads

whose high burnout partner perceived high maternal affection ($\beta = .15$), $\chi^2_{(1)} = 1.30$, $p > .05$, nor was there a significant difference in the path of influence from the high burnout partner's time one school engagement to the low burnout partner's time two school engagement, between dyads whose high burnout partner perceived low maternal affection ($\beta = .08$) and dyads whose high burnout partner perceived high maternal affection ($\beta = .05$), $\chi^2_{(1)} = .04$, $p > .05$.

Do patterns of influence hold when controlling for depression? When depression was added to the model as a control (see Figure 6), model fit worsened $\chi^2_{(56)} = 101.90$, $p < .05$ (NC = 1.8; CFI = .92; RMSEA = .09, 95% CI [.059, .112]). The patterns of influence did not change. Trimming non-significant covariances from time two resulted in enhanced and acceptable model fit, $\chi^2_{(72)} = 113.24$, $p < .05$ (NC = 1.6; CFI = .92; RMSEA = .07, 95% CI [.045, .096]) and, again, patterns of influence did not change. The trimmed model was adopted.

Dyads in which the high burnout partner perceived low maternal affection.

When the high burnout partner perceived low maternal affection, neither partner influenced the other (low burnout partner $\beta = -.03$; high burnout partner $\beta = .10$). A chi-square difference test confirmed there was not a significant difference between these paths of influence, $\chi^2_{(1)} = .69$, $p > .05$.

Dyads in which the high burnout partner perceived high maternal affection.

When the high burnout partner perceived high maternal affection, neither partner influenced the other (low burnout partner path of influence $\beta = .16$; high burnout partner

path of influence $\beta = .04$). A chi-square difference test confirmed there was not a significant difference between these paths of influence, $\chi^2_{(1)} = .50, p = > .05$.

Contrasts between dyads whose high burnout partner perceived low maternal affection and dyads whose high burnout partner perceived high maternal affection. Chi-square difference tests confirmed there was not a significant difference in the prospective path of influence from the low burnout partner's time one school engagement to the high burnout partner's time two school engagement, between dyads whose high burnout partner perceived low maternal affection ($\beta = -.03$) and dyads whose high burnout partner perceived high maternal affection ($\beta = .16$), $\chi^2_{(1)} = 1.16, p > .05$, nor was there a significant difference in the path of influence from the high burnout partner's time one school engagement to the low burnout partner's time two school engagement, between dyads whose high burnout partner perceived low maternal affection ($\beta = .10$) and dyads whose high burnout partner perceived high maternal affection ($\beta = .04$), $\chi^2_{(1)} = .22, p > .05$.

Supplemental Influence Analyses

Sex differences. To determine whether gender moderates patterns of influence, each of the two groups (perceived low and high maternal affection) in both multiple group models (perception of low burnout partners and perception of high burnout partners) were estimated, with and without depression controlled, in eight separate multiple-group models, dividing dyads into groups by gender. There were no significant gender differences on patterns of friend influence.

School track differences. To determine whether the type of secondary level education (senior high or vocational school) moderates patterns of influence, each of the two groups (perceived low and high maternal affection) in both multiple group models (perception of low burnout partners and perception of high burnout partners) were estimated, with and without depression controlled, in eight separate multiple-group models, dividing dyads into groups by school track. There were no significant school track differences on patterns of friend influence.

DISCUSSION

This study investigated friend influence on school engagement. The study's design enabled distinction of who influences whom on school engagement, based on intradyadic differences in school burnout and perceptions of maternal affection. Results suggest that the higher burnout partner in a friendship influences the lower burnout partner only when the lower burnout partner perceives low maternal affection. When the lower burnout partner perceives high maternal affection, there is no evidence of negative influence by a higher burnout partner.

Friends' Influence on School Engagement

This study is not the first to demonstrate friend influence. It is, however, the first to examine how individual differences in school burnout and perceptions of maternal affection interact in the process of friend influence on school engagement. This study provides a unique contribution to the literature on adolescent socialization in at least three ways. First, the investigation demonstrates that friends are a risk factor for school engagement. Second, the investigation suggests that an adolescent's perception of an affectionate maternal relationship is a protective factor against negative friend influence. Third, the investigation supports prior assertions that school burnout is qualitatively distinct from depression. This section will address each of these findings, in turn, and then briefly discuss the importance of the statistical methods that facilitated this investigation.

Friends are a risk factor. This study demonstrated that having a friend with greater school burnout is a risk factor for disengagement from school. How does a friend's school burnout give rise to decreased school engagement during adolescence? Research suggests that friend influence is responsible for similarity among friends in school burnout (Kiuru, Aunola, Nurmi, Leskinen, & Salmela-Aro, 2008). When an adolescent has a high level of school burnout, achievement in school tends to be lower (Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008). It is perhaps not surprising, therefore, that an adolescent may be influenced by a friend with higher school burnout and that an elevation in school burnout may be associated with decreased school engagement.

But why is the friend with higher school burnout the more influential partner? Several mechanisms may be responsible for the dynamics of this influence process. First, as already discussed, we know that adolescents tend to co-ruminate about negative feelings and events (Rose, 2002). We also know that deviance training is fostered by rewards from similar peers for deviant talk (Dishion, Spracklen, Andrews, & Patterson, 1996). As a result, not only might the higher burnout partner initiate discourse about academics but the lower burnout partner may receive rewards for dwelling on his friend's choice of school-related topics. Second, increases in school burnout are associated with decreases in school engagement both in the literature (Schaufeli, Martínez, Pinto, Salanova, & Bakker, 2002) and in this study ($r = -.30, p < .01$). In addition to influence transpiring through discourse as suggested above, it is also

possible that the less academically engaged adolescent disrupts his friend's school engagement by introducing non-academic endeavors into the relationship.

But, as previously discussed, although school burnout and school engagement are inversely associated, they are not opposite sides of the same coin; it is possible for a student to be high in school burnout and also high in school engagement. To confirm that influence resulted solely from the negative influence of a higher burnout friend (i.e., the positive influence of an engaged friend, albeit a higher burnout friend, did not contribute to influence effects), high burnout partners were categorized into groups of low school engagement ($> .25$ SD below the mean) or high school engagement ($> .25$ SD above the mean) and the low burnout partners' school engagement means were plotted across time one and time two under four conditions: when the low burnout partner perceived high maternal affection and had a high engaged partner; when the low burnout partner perceived high maternal affection and had a low engaged partner; when the low burnout partner perceived low maternal affection and had a high engaged partner; and when the low burnout partner perceived high maternal affection and had a low engaged partner. See Figure 9. The graph shows that low burnout partners in each condition (low or high perceived maternal affection) reported decreased school engagement, whether their higher burnout friend reported low or high school engagement. Further, the lower burnout friend reported the greatest decrease in school engagement when they perceived low maternal affection and were paired with a higher burnout friend whose initial school engagement was low.

Study results indicate that the absolute level of school burnout does not drive the influence effects. School burnout scores were included in the models as a control (see Figures 3 through 8). This means that effects hold for all friendship partners in each of the relative categories (lower school burnout partner and higher school burnout partner), regardless of absolute levels of school burnout, and confirms the conclusion that relative levels of school burnout are driving the influence effects observed.

Study findings suggest that one person in each friendship dyad is at risk for negative friend influence on school engagement. Fortunately, most adolescents have more than one friend. Unless an adolescent repeatedly selects friends with the same relative level of school burnout, he or she is likely to derive positive benefits from friendship. It is generally accepted that friends can be a developmental asset. For example, having a friend (versus not having a friend) has been linked with better social skills, greater self-confidence, less depression, less loneliness, higher self-esteem, and has been shown to protect youth against peer victimization (for a review see Hartup & Stevens, 1997). The point is, some friends are assets and some friends are liabilities. If we are to understand which is true, the characteristics of the friend must be considered (Hartup, 1996).

Mothers are a protective factor. In the present investigation, adolescents' school engagement was not always influenced by a friend with a higher level of school burnout. When the low burnout partner perceived high affection in their relationship with their mother, the risk of negative influence from the higher burnout partner on school engagement was mitigated. How does maternal affection protect against friend's

negative influence on school engagement? The mechanisms of this buffering effect are not known. But it may be helpful to discuss these findings in light of past research and within relevant theoretical frameworks.

Research demonstrates that when self-esteem is high, adolescents are less subject to the negative influence of friends (Zimmerman, Copeland, Shope, & Dielman, 1997). The relational schema perspective on self development (Ogilvie & Ashmore, 1991) holds that self-experience is shaped by interpersonal relationships. Maternal affection in particular is requisite for developing strong self-concept and high self-esteem (Baldwin, 1992; Harter, 1999). Moreover, perceptions of mother have also been shown to influence self-esteem when with peers (Ojanen & Perry, 2007). Thus, it is plausible that perceptions of an affectionate mother fostered a stronger sense of self and increased self-esteem, which in turn exerted protective effects in the current investigation.

A review of attachment theory (Bowlby, 1969, 1973) suggests that a mother's protective influence begins at birth. A central tenet of attachment theory is that children develop representations, called *internal working models*, of themselves and of the world around them from experiences with primary caregivers. When a child has an affectionate and nurturing relationship with a primary caregiver, the child comes to view him- or herself as acceptable and worthwhile. When a child experiences negative interactions with a primary caregiver, the child develops an internal representation of him- or herself as unworthy and unacceptable. These negative interactions also lead to a poor child-caregiver attachment bond (Ainsworth, Blehar, Waters, & Wall, 1978). Not

surprisingly, evidence suggests that self-esteem is higher when attachment with the primary caregiver is secure than when it is not (Bartholomew & Horowitz, 1991).

Internal working models help individuals understand their environment and anticipate the nature of future interactions and relationships. Adolescents with well-adjusted internal working models of self and of others (that are fostered by a secure attachment with an affectionate mother) are likely to be more resistant to negative peer influence than are adolescents who harbor feelings of rejection, incompetence, and inadequacy.

The literature on social influence provides further explanation as to why friend influence might be greater for those with poor maternal relationships and resultant maladjusted internal working models. Conformance to peers' thoughts and behaviors has been shown to occur for two reasons. First, people conform to the thoughts and behaviors of others when they believe those others have more correct information than they do. This is called *informational social influence* (Cialdini, 2000; Deutsch & Gerard, 1955). Adolescents with maladjusted internal working models likely seek information from friends due to their own feelings of inadequacy, and are influenced in the process. Second, people conform to the thoughts and behaviors of others to gain acceptance. This is called *normative social influence* (Asch, 1951, 1956; Cialdini, Kallgren, & Reno, 1991; Deutsch & Gerard, 1955). We adopt the thoughts and behaviors of others because we want to be liked. Adolescents with maternal relationships lacking affection have likely developed internal working models that anticipate rejection from others, and are thus more susceptible to normative social influence because they work even harder to seek acceptance. Whether informational

social influence or normative social influence were causative factors for influence in the present investigation can never be known, but poor maternal relations could certainly promote these types of influence and study results clearly indicate that a poor relationship with mother was at the root of the negative influence process.

A final speculation about the mechanisms of maternal protection involves relative levels of influence among parents and friends. Although youth separate from parents during adolescence, establishing greater autonomy and turning to friends more for guidance and support, there are continuities in emotional bonds with, and the potential influence of, parents (Collins & Laursen, 2000). Parents might be more directly influential on matters relating to school than are friends during adolescence, as long as relationships with parents are good. But when relationships with parents are poor, it is likely that parental influence diminishes or becomes negative. The literature reflects that while peers are more influential about immediate issues regarding lifestyles (Kandel, 1996), parents are more influential when it comes to long-term goals such as educational aspirations (Kandel & Lesser, 1969). In the current study, perhaps when adolescents perceived high maternal affection the mother's positive influence on academic engagement overpowered the negative influence of a high burnout friend, but when adolescents perceived low maternal affection, the friends' negative influence was dominant.

Whatever the mechanisms, it is clear that the maternal relationship serves as a strong protective factor that should be further explored. While many aspects of maternal relationships are not easily directed by social policy, some schools have embarked upon

parent training programs that have made a difference in youth education. For example, the Family Check-Up Intervention Model (FCU; Stormshak, Fosco, & Dishion, 2010) targeted 377 adolescents and their families across three public middle schools in urban-America to provide support for parenting skills and family management practices. Follow-up studies suggest that the intervention resulted in increased self-regulation skills among the adolescents, which in turn led to increased school engagement (and lower depression). Given the results of the present investigation, perhaps the results realized in the FCU intervention were due, at least in part, to the establishment of better adolescent-parent relationships which, in turn, buffered effects of negative friend influence.

School Burnout is Not a Proxy for Depression

Is school burnout a proxy for depression when investigating friend influence on school engagement? The effects of school burnout on the influence process observed in this study were not a product of individual levels of depression. The same pattern of results emerged when depression was included and excluded from the models. Previous studies (e.g., Salmela-Aro, Savolainen, & Holopainen, 2009) suggest that school burnout is a unique construct, qualitatively different from depression. A major distinction between depression and school burnout is that depression is a global cognitive-affective state, while school burnout is specific to the school context. It is likely that this distinction renders school burnout a more effective conduit for negative friend influence involving school engagement than does depression because co-rumination resulting from the negative state will dwell on academically-related issues,

versus abstract global issues. Exploring depression in the models in place of school burnout as a distinguishing variable bolstered this line of thought when the same pattern of influence was visible, but did not rise to the level of significance.

Evidence that effects of school burnout are not a result of depressive symptoms has important implications for adolescents suffering from high levels of school burnout. Depression is a mood disorder that often warrants clinical treatment involving the administration of antidepressants. While school burnout can ultimately lead to depression if left unattended (Salmela-Aro, Savolainen, & Holopainen, 2009), school burnout is not depression. So how should school burnout be addressed if not as a depressive symptom? School burnout is a cognitive-affective state, characterized by exhaustion due to school demands, feelings of inadequacy as a student and cynicism towards school. Adolescents face an overwhelmingly large number of demands—juggling schoolwork, extracurricular activities, sports, and social and family obligations—and often spread themselves too thin in a number of commitments. School burnout may be best treated by getting organized, by simply slowing down, and by including proper diet, sleep and exercise in daily routines. Research suggests that academia can also make a difference, with both positive teacher motivation and school support being inversely linked with school burnout (Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008).

Influence Effects are Not Moderated by Sex or School Track

Sex did not moderate patterns of friend influence in this investigation. Given that some researchers have found sex differences in social influence and others have not

(for reviews see Eagly, 1978; Eagly & Carli, 1981; Weiss, Weiss, Wenninger, & Balling, 1981), it was important to determine whether patterns of friend influence on school engagement varied as a function of sex. When sex differences have been found, females were more easily influenced than males, although effect sizes have been small (Eagly & Carli, 1981). One potential explanation for emergence of sex differences in some studies (and not others) is the power status differential between males and females, due to socialization into different roles (Eagly, 1983). This is not an issue when investigating influence between same-sex, same-age friends. A second reason it was important to rule out sex differences in patterns of friend influence on school engagement is that studies have shown that when compared to adolescent boys, adolescent girls have higher levels of school burnout (Salmela-Aro, Kiuru, Pietikäinen, & Jokela, 2008; Salmela-Aro, Savolainen, & Holopainen, 2009) and school engagement (Véronneau & Dishion, 2011). Ruling out sex as a moderator of patterns of friend influence enables the conclusion that effects of school burnout function similarly in the friend influence process involving school engagement for both boys and girls.

School track did not moderate patterns of friend influence in this investigation. Given that adolescents on academic tracks have reported higher levels of academic achievement and school burnout than adolescents on vocational tracks (Kiuru, Nurmi, Aunola, & Salmela-Aro, 2009), it was important to determine whether patterns of friend influence on school engagement were dependent on the type of secondary level education pursued. They were not. Moreover, students on an academic track often have a strong orientation towards school, where academic demands are typically higher than

they are in vocational schools. These differences may present a greater risk for exhaustion (Roderick & Camburn, 1999), which is a component of school burnout. Ruling out school track as a moderator of the patterns of friend influence demonstrated in this study enables the conclusion that school burnout functions similarly in the friend influence process involving school engagement, for both academic and vocational students.

The Importance of Distinguishing Dyad Members and Examining Indirect Effects

Two methodological issues were highlighted during the course of this investigation. The first is the importance of distinguishing dyad members on some theoretically meaningful basis when studying friend influence. The second is the importance of investigating beyond direct-effects models, to explore moderators (even, perhaps especially, in the face of null findings in direct-effects models). Both are critical components of study design when investigating same-sex friendship dyads (Laursen, 2005).

Distinguishing dyad members. It could be argued that same-sex friends can never be described as distinguishable partners and that analyses for exchangeable dyads are always more appropriate. This not only oversimplifies the matter but also yields oversimplified results, which is demonstrated by the APIM for exchangeable dyads that was estimated as a starting point in the present investigation. Although the APIM for exchangeable partners confirmed friend influence on school engagement, it offered no insight into the process or into who influences whom.

According to Kenny et al. (2006), it is reasonable to “create a variable that can be used to distinguish dyad members. If such a variable is theoretically and empirically meaningful, this approach is not problematic” (pp. 6-7). School burnout is theoretically meaningful in this study given the conceptual basis for the prediction that the high burnout partner would be more influential than the low burnout partner. School burnout is also empirically meaningful because it can be reliably measured (Salmela-Aro, Kiuru, Leskinen, & Nurmi, 2009) and the test for distinguishability reveals distinct variance and correlation matrices for low burnout partners and high burnout partners. This indicates that school burnout is a meaningful factor for distinction in this investigation, and the partners’ scores can be reliably ordered to enable quantitative analyses for distinguishable partners. The APIM for distinguishable partners produces unique estimates for each partner’s path of influence, and enables exploration into differences between partners.

Using the APIM for distinguishable partners in this investigation ultimately revealed that adolescents’ school engagement is negatively influenced by a friend with higher levels of school burnout, if the adolescent perceives low maternal affection. It is important to note, however, that prior to investigating potential moderating effects of maternal affection, the direct effects APIM for distinguishable partners did not suggest friend influence, let alone implicate school burnout as a distinguishing variable in the influence process (i.e., no influence paths emerged). The high burnout partner’s influence effects were suppressed by the absence of influence effects from the low burnout partner. Subsequent estimation of a re-fitted indirect-effects APIM (i.e., a

multiple-group model testing for moderation) for distinguishable partners underscored the importance of investigating friend influence while considering the potential indirect effect of perceptions of maternal affection, when influence effects re-emerged.

Investigating indirect-effects models. Using the APIM for distinguishable partners (distinguishing friends based on relative levels of school burnout) in a multiple group model to investigate whether perception of maternal affection moderates the friend influence process, the APIM for exchangeable dyads that initially suggested friend influence was supported. Further, the indirect-effects model demonstrated that school burnout and perceptions of maternal affection are important interactive factors in the friend influence process involving school engagement. Without question, direct-effects models are sometimes informative. But too often they fall short of supporting the alternative hypothesis we are investigating because effects are masked by moderated effects. Including variables that are theoretically or conceptually implicated as potential moderators of direct effects is an important aspect of study design that may make the difference between detecting significant effects, or not.

Limitations

This study is not without limitations. First, this sample was drawn from a small city in central Finland, where the population is homogeneous. Future research needs to include a more diverse sample to demonstrate the generalizability of this study's conclusions. It should also be noted, however, that this sample comprised all schools within a community, an advantage not often seen in U.S. samples. Second, although the sample size was more than adequate to conduct the primary investigations, cell sizes in

supplemental analyses investigating possible sex and school track differences were small and power to detect differences was limited. Third, data were collected one year apart. Investigating friend influence on school engagement over a longer period of time may yield additional information on effect sizes and the influence process. Fourth, it should be noted that all data used in this investigation was derived through self-reports. Not all individuals accurately report certain behaviors. However, in the case of school burnout and school engagement, self-perceptions are particularly important due to the cognitive components of these constructs. Finally, interpersonal influence is dynamical, with many variables interacting in the process. Because the hypotheses for this study were generated after data collection, variables included in the investigation were constrained by the data available.

Conclusion

In conclusion, this study furthers our understanding of friend influence on school engagement during adolescence. School engagement is critical during adolescence, when school performance determines future academic and employment opportunities. While this study demonstrated that having a friend with a higher level of school burnout is a risk factor for school engagement, it also clearly showed that a good maternal relationship is a protective factor against that risk. A few schools have implemented parent training programs centered on promoting good parenting skills. These programs have proven successful in keeping adolescents engaged in school. Policy makers and educators need to expand this focus. With the right emphasis on the

importance of good parenting, it may be possible to alter the probability of life-course success for at-risk youth.

Table 1

Unstandardized Loadings (Standard Errors) and Standardized Loadings for 9-Item Factor Measuring Adolescent Perception of Maternal Affection

Item	Unstandardized	Standardized
appreciates that I try to do or achieve something	1.12 (.09)	.77
thinks thanking has a greater influence than punishing	1.06 (.09)	.72
respects my opinions	1.16 (.09)	.80
we usually settle things by talking	1.21 (.10)	.71
encourages me to be spontaneous	.94 (.08)	.68
have a good relationship with my mother	1.12 (.08)	.80
takes my thoughts into account	1.20 (.09)	.79
often shows she loves me	1.10 (.10)	.73
knows what things I am interested in	1.00 (---)	.72

Table 2

Sample Means and Mean-Level Differences

	Time One						Time Two					
	Low Burnout Partner		High Burnout Partner		Total		Low Burnout Partner		High Burnout Partner		Total	
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD
School Engagement	4.06	1.22	3.70	1.15	3.87 ^a	1.18	3.78	1.22	3.47	1.15	3.70 ^b	1.22
School Burnout	1.87	.61	2.92	.76	2.33 ^a	.85	2.30	.83	2.79	.84	2.50 ^b	.86
Depression	1.37	.39	1.71	.59	1.53 ^a	.53	1.44	.49	1.70	.56	1.55 ^a	.54
Maternal Affection	5.76	1.04	5.32	1.16	5.52	1.12						

Note: Scores represented are unstandardized. The response scale for *School Engagement* ranged from 1 to 6 (time one total $n = 316$; time two total $n = 314$). The response scale for *School Burnout* ranged from 1 to 6 (time one total $n = 316$; time two total $n = 314$). The response scale for *Depression* ranged from 0 to 4 (total $n = 320$ both time one and time two). The response scale for *Maternal Affection* ranged from 1 to 7 (total $n = 318$). Higher scores indicate higher levels of each measure. Across rows, total time one and total time two means with different subscripts differ

Table 3

Intercorrelations Among Study Variables for the Total Sample

	1	2	3	4	5	6	7
Time One							
1. School Engagement	—						
2. School Burnout	-.30**	—					
3. Depression	-.30**	.55**	—				
4. Maternal Affection	.26**	-.22**	-.23**	—			
Time Two							
5. School Engagement	.62**	-.25**	-.26**	.17**	—		
6. School Burnout	-.19**	.59**	.44**	-.23**	-.32**	—	
7. Depression	-.15**	.44**	.59**	-.19**	-.28**	.58**	—

Note: ** $p < .01$. Total sample $n = 320$; correlation $n = 309$ to 320 , depending on variables.

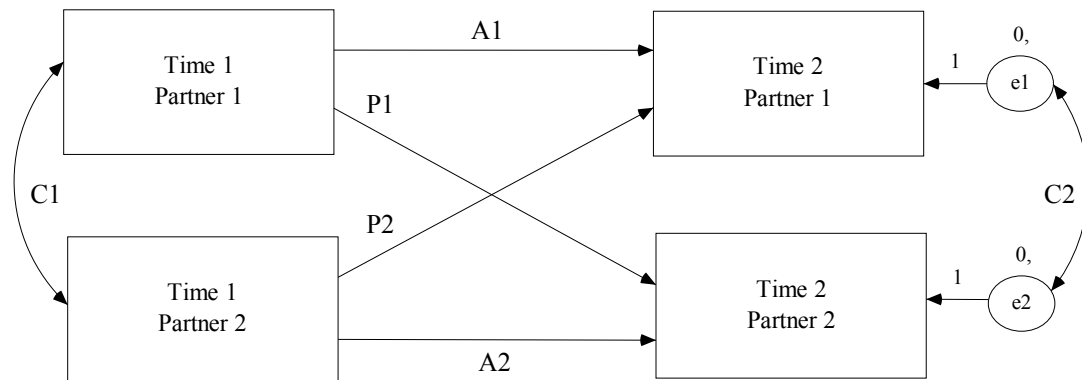
Table 4

*Intercorrelations Among Study Variables for Low and High Burnout Partners**Separately*

	1	2	3	4	5	6	7
Time One							
8. School Engagement	—	-.37**	-.29**	.28**	.50**	.07	-.15
9. School Burnout	-.30**	—	.59**	-.25**	-.16	.46**	.38**
10. Depression	-.24**	.41**	—	-.19*	-.22*	.45**	.64**
11. Maternal Affection	.23*	-.07	-.31**	—	.13	-.21*	-.14
Time Two							
12. School Engagement	.78**	-.30**	-.21*	.23*	—	-.24**	-.32**
13. School Burnout	-.25**	.68**	.35**	-.13	-.33**	—	.66**
14. Depression	-.16	.42**	.64**	-.27**	-.16	.48**	—

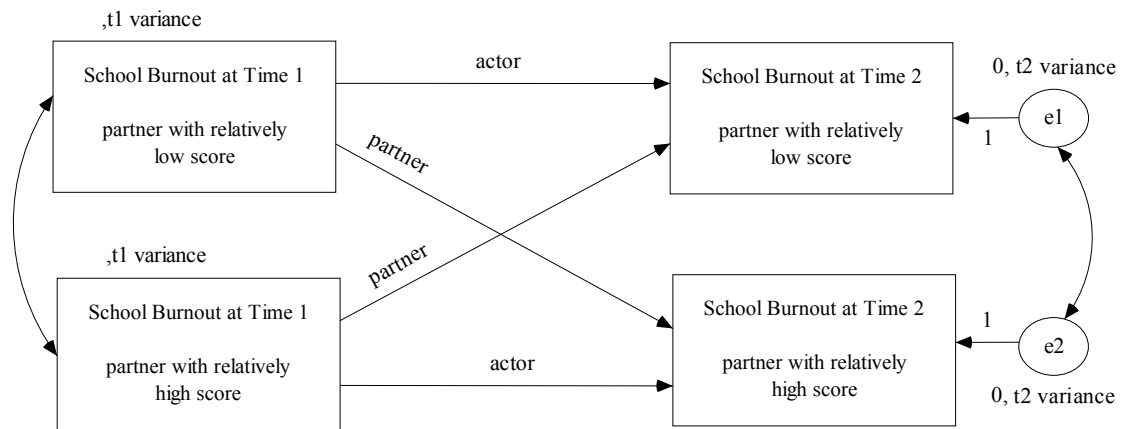
Note: * $p < .05$, ** $p < .01$. Friends with school burnout scores within .25 standard deviations of one another omitted from analysis. Low burnout partners ($n = 127$) are below the diagonal, high burnout partners ($n = 127$) are above the diagonal. Correlation $n = 122$ to 127.

Figure 1. Actor-Partner Interdependence Model for Testing Peer Influence



Note. Paths A1 and A2 (actor paths) indicate an individual's influence on his or her own behavior between waves of data collection (also called stability paths). Paths P1 and P2 (partner paths) indicate influence of one partner on another between waves of data collection.

Figure 2. *Omnibus Test of Distinguishability*



Note. Variances, the interpersonal path, and the intrapersonal path parameters are constrained in AMOS. A significant χ^2 difference test contrasting this model with an unconstrained model indicates that friends are distinguishable on the variable being tested.

Figure 3. *Multiple Group Model of Friend Influence on School Engagement as a Function of Relative School Burnout: Dyads Divided into Low and High Maternal Affection Groups on the Basis of the Low Burnout Partner's Perception of Maternal Affection*

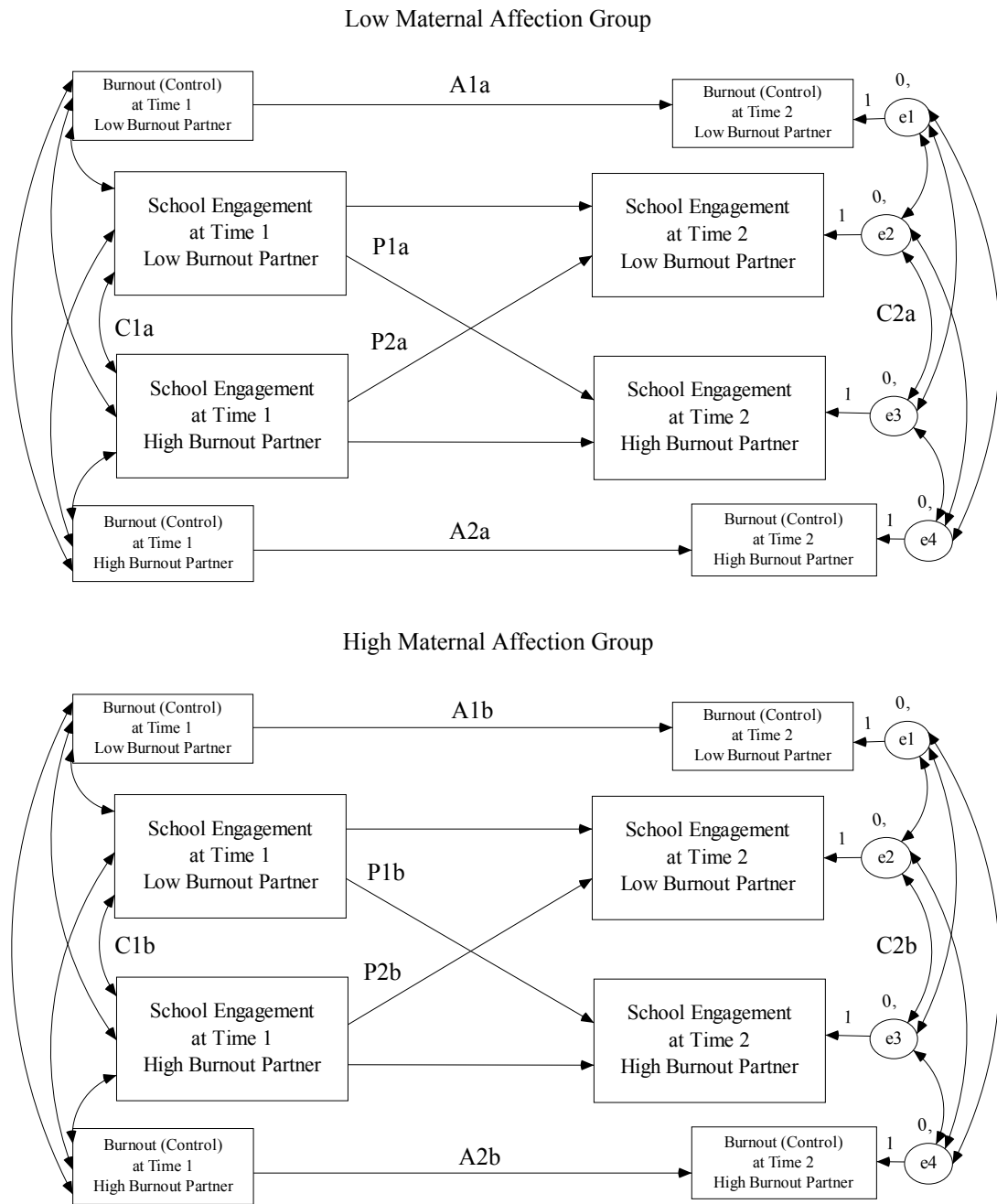


Figure 4. *Multiple Group Model of Friend Influence on School Engagement as a Function of Relative School Burnout: Dyads Divided into Low and High Maternal Affection Groups on the Basis of the High Burnout Partner's Perception of Maternal Affection*

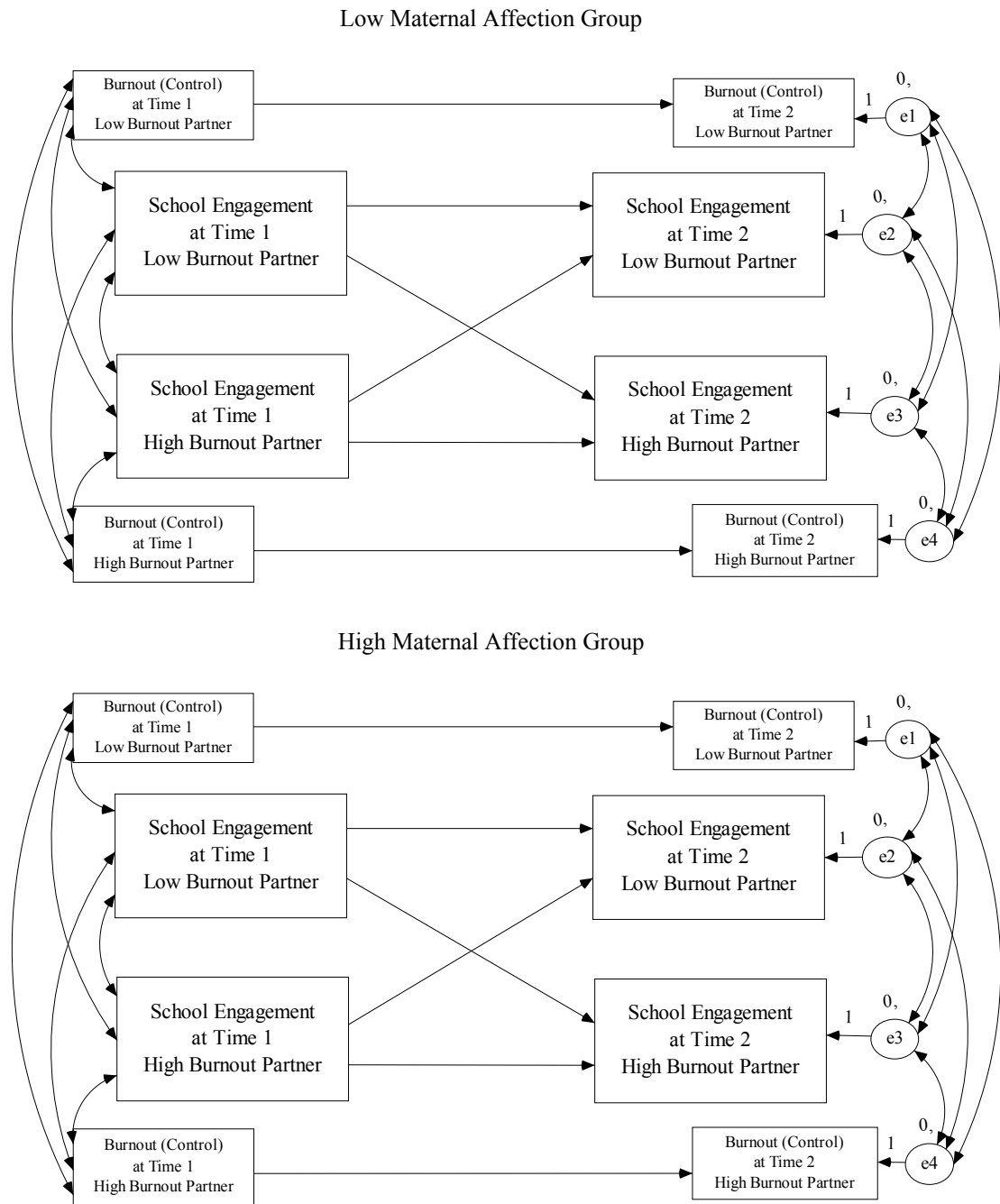


Figure 5. Multiple Group Model of Friend Influence on School Engagement as a Function of Relative School Burnout, Controlling for Initial Depression: Dyads Divided into Low and High Maternal Affection Groups on the Basis of the Low Burnout Partner's Perception of Maternal Affection

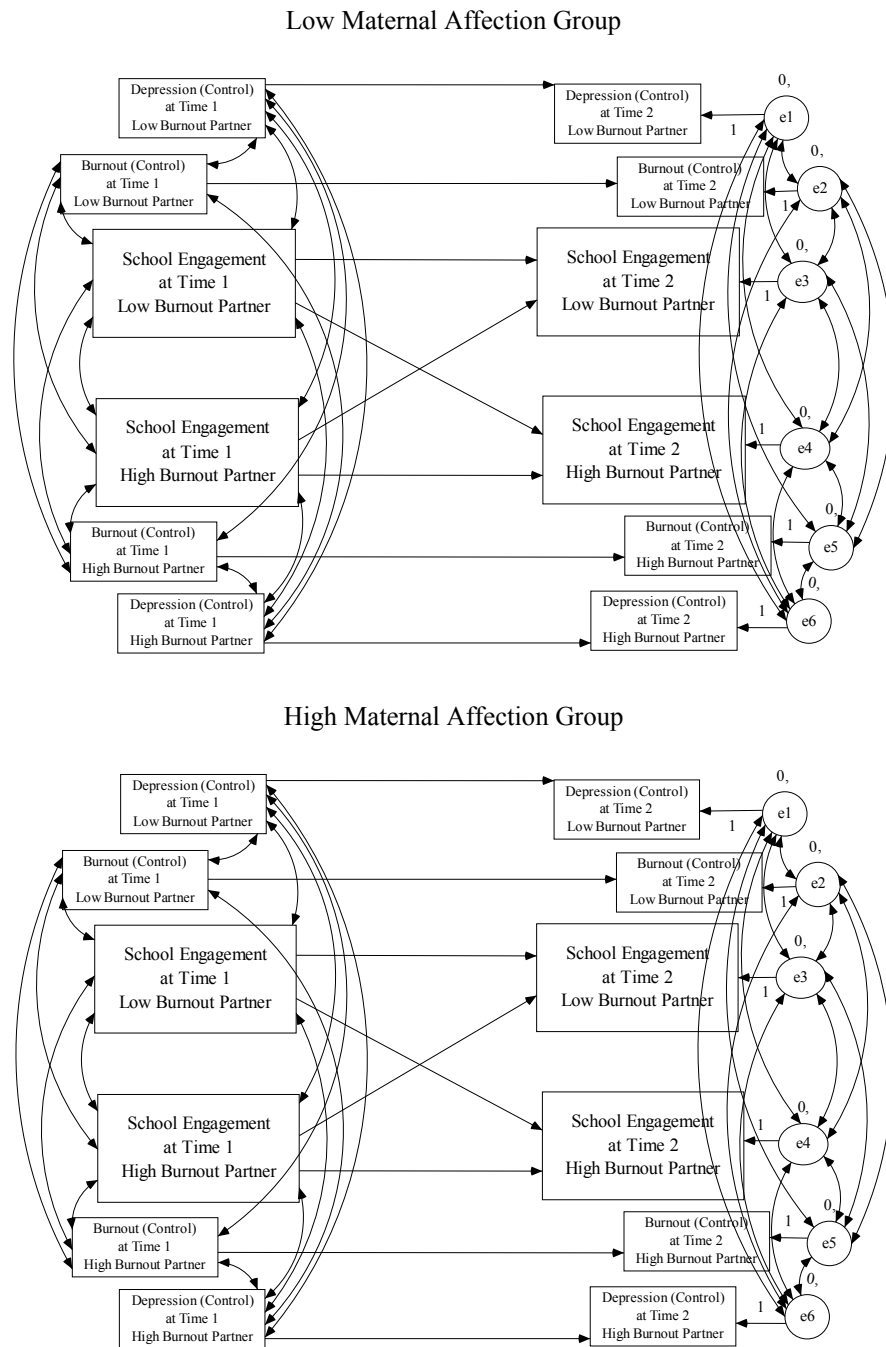


Figure 6. *Multiple Group Model of Friend Influence on School Engagement as a Function of Relative School Burnout, Controlling for Initial Depression: Dyads Divided into Low and High Maternal Affection Groups on the Basis of the High Burnout Partner's Perception of Maternal Affection*

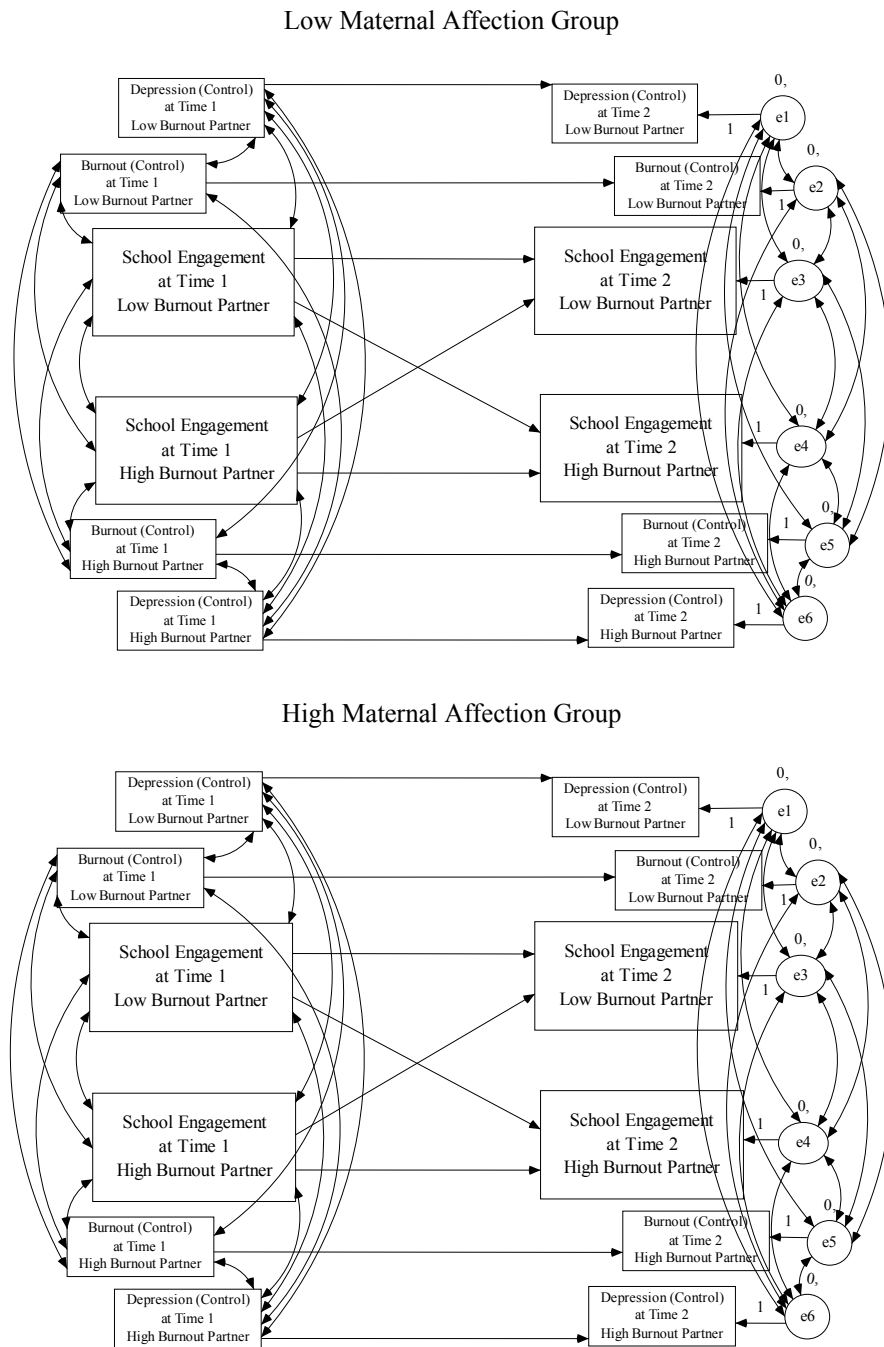
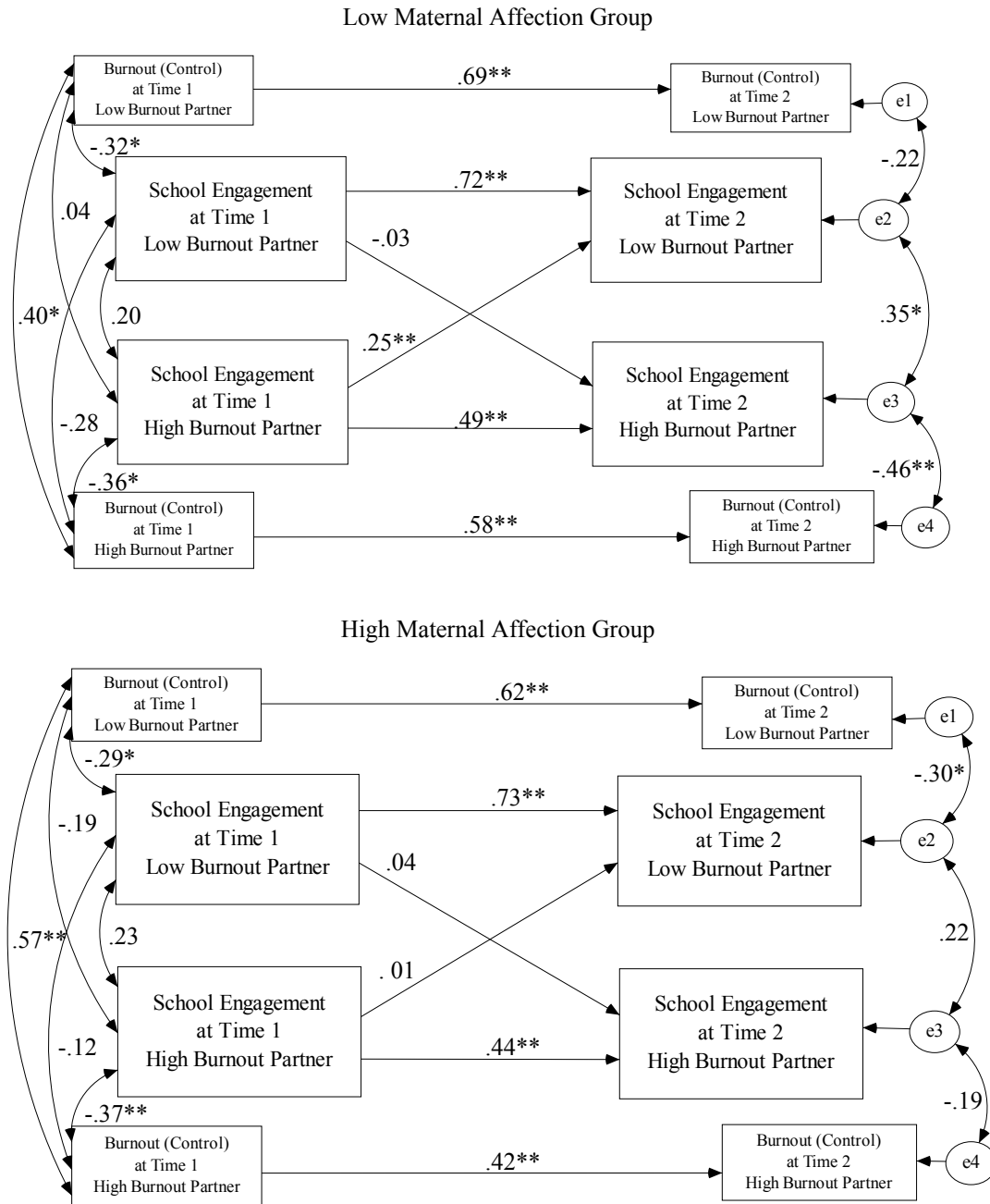
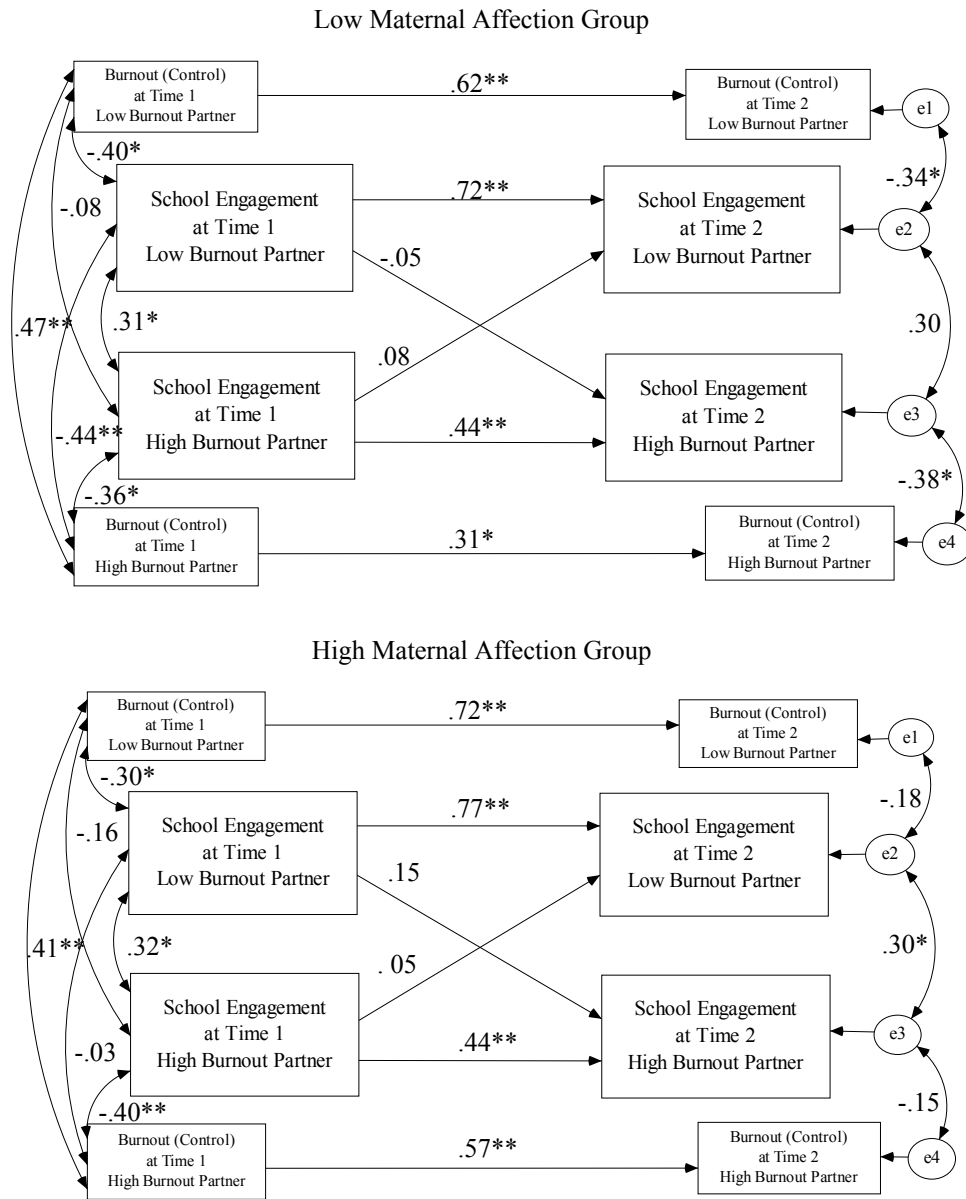


Figure 7. *Friend Influence on School Engagement as a Function of Relative School Burnout; Groups Based on the Low Burnout Partner's Perception of Maternal Affection*



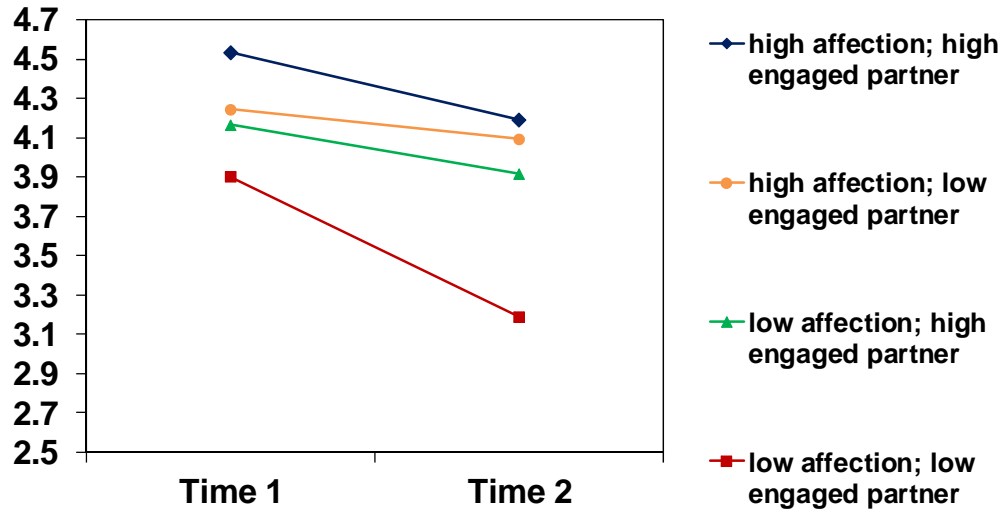
Note. $n = 46$ friend dyads for low burnout partner's perception of low maternal affection group. $n = 66$ friend dyads for low burnout partner's perception of high maternal affection group. * $p < .05$. ** $p < .01$.

Figure 8. *Friend Influence on School Engagement as a Function of Relative School Burnout; Groups Based on the High Burnout Partner's Perception of Maternal Affection*



Note. $n = 49$ friend dyads for greater burnout partner's perception of low maternal affection group. $n = 64$ friend dyads for greater burnout partner's perception of high maternal affection group. * $p < .05$. ** $p < .01$.

Figure 9. *Low Burnout Partners' School Engagement Under Conditions of High and Low Maternal Affection, When Friends' School Engagement is High or Low.*



Note. Member scores in each low group are at least .25 SD below the mean. Member scores in each high group are at least .25 SD above the mean. High affection, high engaged partner $n = 30$; high affection, low engaged partner $n = 24$; low affection, low engaged partner $n = 14$; low affection, high engaged partner $n = 21$.

APPENDICES

APPENDIX A

Questionnaire Items on School Engagement

Now think about your current studies and matters related to it.							
	Never	A few times a year	Once a month	A few times a month	Once a week	A few times a week	Every day
When I study, I feel like I am bursting with energy.	0	1	2	3	4	5	6
I find my studies to be full of meaning and purpose.	0	1	2	3	4	5	6
Time flies when I'm studying.	0	1	2	3	4	5	6
When studying I feel vigorous.	0	1	2	3	4	5	6
I am enthusiastic about my studies.	0	1	2	3	4	5	6
When I am studying, I forget everything else around me.	0	1	2	3	4	5	6
My studies inspire me.	0	1	2	3	4	5	6
When I get up in the morning, I feel like going to class.	0	1	2	3	4	5	6
I can get carried away by my studies.	0	1	2	3	4	5	6

APPENDIX B

Questionnaire Items on School Burnout

Please choose the alternative that best describes our school circumstances. The choices should describe your current school situation.						
	Completely disagree	Disagree	Partly disagree	Partly agree	Agree	Completely agree
I feel I am drowning in school work.	1	2	3	4	5	6
I feel myself unwilling at school and I often think of quitting school.	1	2	3	4	5	6
I often have feelings of inadequacy at school.	1	2	3	4	5	6
I often sleep badly because of various school things.	1	2	3	4	5	6
I feel I am losing my interest towards school.	1	2	3	4	5	6
I constantly ask myself if my school attendance has any meaning.	1	2	3	4	5	6
I feel I have less and less to give at school.	1	2	3	4	5	6
I also think about school things a lot during free time.	1	2	3	4	5	6
Before I expected to get more things done at school than now.	1	2	3	4	5	6
The pressure of school work caused problems in my close relationships.	1	2	3	4	5	6

APPENDIX C

Questionnaire Items on Depression

How has your mood been during the last month?	Not at all	Somewhat	Quite Much	Very much
I suffered from sleeplessness.	1	2	3	4
I felt myself sad.	1	2	3	4
I felt everything required effort.	1	2	3	4
I felt myself unenergetic.	1	2	3	4
I felt myself lonely.	1	2	3	4
The future seemed hopeless.	1	2	3	4
I did not enjoy my life.	1	2	3	4
I felt myself unworthy.	1	2	3	4
I felt all the joy had disappeared from my life.	1	2	3	4
I felt my sadness was not relieved even with the help of my family or friends.	1	2	3	4

APPENDIX D

Questionnaire Items on Parental Relations

The following claims describe your relations to your parents. Please evaluate how well these claims fit your relationship with your mother and your father.														
1 = does not fit me at all — 7 = Fits me completely														
	Mother							Father						
My mother often shows me how much she appreciates the fact that I try to do or achieve something	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother thinks thanking me has a greater influence than punishing me	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother respects my opinions	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother thinks scolding and reminding me of things is appropriate	1	2	3	4	5	6	7	1	2	3	4	5	6	7
When my mother gets angry she shows it	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother thinks it is important that rules are followed in our family	1	2	3	4	5	6	7	1	2	3	4	5	6	7
If I have a disagreement with my mother, we usually settle things by talking	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother thinks a young person must behave well towards her or his parents	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother usually knows what I am doing and where I am	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother encourages me to be spontaneous	1	2	3	4	5	6	7	1	2	3	4	5	6	7
It is important for my mother that I obey her	1	2	3	4	5	6	7	1	2	3	4	5	6	7

continued on next page...

APPENDIX D (continued)

Questionnaire Items on Parental Relations

1= does not fit me at all — 7 = Fits me completely														
	Mother							Father						
I have a good relationship with my mother	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother takes my thoughts into account when planning things for our family	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother often reminds me of all the things she has done for me	1	2	3	4	5	6	7	1	2	3	4	5	6	7
If I behave badly or inappropriately, my mother clearly shows she is disappointed and ashamed	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother thinks I should appreciate how good things are	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother often reminds me how much she has sacrificed for me	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother often shows she loves me	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother knows what things I am interested in	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother does not let me get angry at her	1	2	3	4	5	6	7	1	2	3	4	5	6	7
My mother knows who I spend my time with	1	2	3	4	5	6	7	1	2	3	4	5	6	7

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