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Longitudinal Investigation Into the Role of Perceived Social Support in Adolescents' Academic Motivation and Achievement

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We examined (a) the relative importance of perceived social support from parents, peers, and teachers; (b) the consequences associated with different types of perceived social support; and (c) the mediation by achievement goals in the relationship between perceived social support and academic outcomes. We analyzed the first 3 waves of the Korean Educational Longitudinal Study 2005 data (Y. Kim et al., 2007), which followed students from Grade 7 to Grade 9 in middle school. Compared with the other 2 social agent groups, support from parents predicted the widest variety of adolescent motivation and achievement indexes. Parental emotional support was most beneficial, predicting stronger mastery goals, weaker performance-avoidance goals, lower test anxiety, and higher academic achievement than any other type of support. Parental academic support functioned as a double-edged sword, predicting not only stronger mastery goals but also stronger performance-approach goals, stronger performance-avoidance goals, and higher test anxiety. Achievement pressure from teachers had the same predictive relationships but was weaker in strength. Perceived emotional support from teachers was not as effective as that from parents in predicting adolescent motivation achievement; however, perceived academic support from teachers was helpful for adolescents in predicting stronger mastery goals. Support from peers worked as a buffer against maladaptive motivation, predicting weaker performance-avoidance goals and lower test anxiety. Mastery goals mediated the relationship between social support and academic achievement, whereas performance-approach goals and performance-avoidance goals mediated the relationship between social support and test anxiety. The same patterns emerged consistently for all 3 years at middle school.

Keywords: social support, achievement goals, test anxiety, academic achievement, longitudinal study

The academic motivation and achievement of adolescents must be understood within not only specific learning and performance contexts but also the broader social and psychological settings in which they function (Bronfenbrenner, 1986; Eccles et al., 1993). For adolescents, their perception of the social support they receive from significant others constitutes an integral part of their social and psychological environment. Mounting evidence has demonstrated that perceived social support plays an influential role in various aspects of student adjustment at school (Cohen & Wills, 1985; Demaray, Malecki, Davidson, Hodgson, & Rebus, 2005; Goodenow, 1993; Ladd, 1990; Sarason & Sarason, 1986; Wentzel, 1997, 1998).

Although a consensus exists in the literature that social support contributes positively to adolescent motivation and learning at school, several issues related to the exact function of perceived social support are yet to be clearly understood (Wentzel, Battle, Russell, & Looney, 2010). These issues include (a) the relative importance of different social agents in terms of the support they provide, (b) the consequences associated with different types of social support, and (c) the potential mediation by adolescents' motivational beliefs in the relationship between perceived social support and academic outcomes.

In particular, research that considers the independent contributions of social—academic and emotional—support from parents, teachers, and peers is required. Parents, teachers, and peers are major sources of support during adolescence. With few exceptions (e.g., H. Patrick, Ryan, & Kaplan, 2007; Wentzel, 1998), existing studies have customarily assessed perceived support from these social agents as a unitary construct without distinguishing between the support provided by different figures. However, the support from a particular social agent may be more consequential than support from other agents in shaping motivation and performance during adolescence. Further, perceived support from different social agents may or may not have an effect on adolescent development.

The same argument applies to the different types of support provided by the same social agent. Perceived support that is mainly academic in nature, such as providing study tips to adolescent students, is expected to have a different effect on their motivation and performance than would purely emotional support, such as providing empathy and encouragement. It will also be helpful to learn the psychological mechanisms through which social support

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results in concrete academic outcomes. Wentzel (1998) suspected that academic motivation in the form of interest and achievement goals is one likely mediator linking social influence to academic performance. H. Patrick et al. (2007) likewise tested self-efficacy and various achievement goals as potential mediators in the relationship between social support and academic achievement. We set out to examine the role of achievement goals in this research.

In addition, previous research has primarily been concerned with Western education settings; thus, the applicability of the results derived from these studies to other populations also needs to be ascertained. Social support is presumed to exercise a positive influence on the adjustment of both East Asian and Western adolescent learners, regardless of cultural differences. Nonetheless, it is possible that social support plays a more determining role in the academic motivation and achievement of East Asian adolescents because of their interdependent self-construal and proclivity toward social harmony (Markus & Kitayama, 1991). Analyzing a nationally representative sample of Korean middle school students, as we did in this study, would help test the generalizability of previous findings and uncover any cultural idiosyncrasies.

Whose Support Is Most Important in the Motivation and Achievement of Adolescents?

The Relative Contribution of Different Social Agents

The home and school are the two most important social environments for adolescents (Bronfenbrenner, 1986). In these environments, parents, teachers, and peers serve as the three primary social agents who influence the development and learning of adolescents (Eccles et al., 1993; Wentzel, 1998). Parents are the key socializing agents at home, having a wide-reaching impact on adolescent development, including attitudes toward learning. Teachers and peers are the major social agents at school, whose support often determines the levels of academic interest, self-concept, and psychological distress that adolescents experience, as well as the type of academic and social goals they pursue (DuBois, Felner, Brand, Adan, & Evans, 1992; Goodenow, 1993; Wentzel, 1998).

Although few dispute that parents, teachers, and peers are all important figures during adolescence, only a small number of studies have empirically compared, in a single investigation, the relative contribution these three social agents make as sources of perceived support. The study by Wentzel (1998) is one such investigation. She assessed family cohesion, perceived support from teachers, and perceived support from peers in a group of middle school students. Pertinent to this study are her findings that (a) different social agents did not interact in terms of the perceived support they provided, but rather contributed independently to student motivation; and (b) the perceived support from each social agent predicted slightly different motivational outcomes. In particular, family cohesion positively predicted school interest and mastery goal orientation and negatively predicted performance goal orientation. Perceived support from teachers positively predicted school interest, class interest, and the pursuit of prosocial goals, whereas perceived support from peers positively predicted only the pursuit of prosocial goals.

Evidence also suggests the influence of parents, teachers, and peers in terms of the social support they provide differs. Demaray et al. (2005) examined the predictive utility of the perceived support from parents, teachers, classmates, close friends, and school for adolescent adjustment. Of these five sources, support from parents predicted the widest range of adjustment indexes for middle school students, followed by support from classmates. Personal adjustment (a composite measure of the relationship with parents, interpersonal relations, self-reliance, and self-esteem) was positively predicted by the support from parents when measured 6 months later. Parental support also negatively predicted clinical maladjustment (a composite of social stress, anxiety, somatization, atypicality, and locus of control) and emotional symptoms (a composite of anxiety, social stress, depression, sense of inadequacy, interpersonal relations, and self-esteem) when assessed 1 year later. Support from classmates was also a negative predictor of emotional symptoms after 1 year. Support from teachers or close friends did not predict the adjustment indexes of adolescents in the presence of support from other sources. Support from their school, however, negatively predicted school maladjustment (represented by negative attitudes toward and dissatisfaction with school, teachers, personnel, and structures within the school) when assessed 1 year later.

Perceived support from school, therefore, only predicted maladjustment that was specifically related to school. This limited impact contrasts with that of parental support, which affected a diverse range of indexes for adolescent adjustment. Ryan, Stiller, and Lynch (1994) reported similar findings. The researchers compared the predictive utility of the representations of relationships with parents, teachers, and friends in terms of student motivation at middle school. Here, the representation of relationships refers to a generalized view of interpersonal relationships that organizes ongoing experiences and interactions with significant others. Teacher representation significantly predicted students' positive coping, relative autonomy, perceived control, and positive affect toward school. However, it did not predict self-esteem or identity integration. Friend representation, on the other hand, predicted only self-esteem and not any of the school-relevant outcomes. Consistent with the results of Demaray et al. (2005), parent representation significantly and more strongly predicted both school- and self-relevant outcomes than did the other two representations.

Changing Importance of Social Agents During Adolescence

The changing nature of the relationships with parents, teachers, and peers during adolescence makes it all the more important to examine the independent contributions of the support received from these social figures. Although the significance of friends increases during adolescence (Berndt, 1982; Larson & Richards, 1991), the importance of interpersonal relationships with parents and teachers declines, especially during the transition to middle school (Eccles et al., 1993; Feldlaufer, Midgley, & Eccles, 1988; Larson & Richards, 1991; Spinath & Spinath, 2005). Some researchers have argued that the significance of teachers and friends increases during middle school (Ryan et al., 1994). In general, the connection with social figures outside the family appears to become stronger during adolescence.

A complicating factor is that the consequences for adolescents of an increase in the importance of a specific relationship may be unpredictable. Perceived support from peers, for example, may or may not predict an increase in adolescent motivation, despite the increasing significance of peers during adolescence (Berndt,

1992). Some friendships may be beneficial and others detrimental to academic and emotional adjustment at school (Ryan et al., 1994). In contrast, support from parents and teachers continues to make positive contributions to academic motivation and adjustment during middle school, despite their waning significance during adolescence (Feldlaufer et al., 1988; Midgley, Feldlaufer, & Eccles, 1989; Ryan et al., 1994; Wentzel, 1998).

Parental support is expected to be particularly influential in the motivation and achievement of Korean adolescents—the participants in the present sample. In addition to elements of East Asian cultural heritage, such as interdependent self-construal (Markus & Kitayama, 1991), there are sociocultural and historical factors that are indigenous to Korean culture and society. These include the Confucian notions of filial piety and familism, which require children to pay due respect to and look after the elderly in the family; the Confucian educational system, which has traditionally rewarded successful performance in nationwide examinations with coveted positions in government agencies or entrance to prestigious universities; and the ensuing educational fervor and academic elitism (Bong, Kim, Shin, Lee, & Lee, 2008; Park & Kim, 2006). These factors lead Korean adolescents to feel a strong sense of obligation to recompense their parents with high scholastic achievement for the support they have given and the sacrifices they have made. Perceived parental support thus functions as a source of heightened academic motivation.

In fact, Park and Kim (2000) demonstrated that various forms of social support from parents were significant predictors of a number of adjustment indexes for Korean adolescents, including achievement motivation, life satisfaction, academic achievement, and delinquent behavior. Parental support was also a significant predictor of these indexes in all age groups spanning from elementary school to college, although its predictive utility was strongest at elementary school. Likewise, Jiang, Song, Lee, and Bong (2014) found that the perceived achievement goals of parents were consistent predictors of the achievement goals and self-efficacy of Korean elementary and middle school students, confirming the significant role Korean parents play in their children's academic motivation.

Taken together, these findings demonstrate that the perceived support offered by each social agent makes a unique contribution to student motivation, and that parental support has a potentially greater impact on adolescents' overall adjustment at school, both academically and emotionally. It also appears that support from parents plays a particularly consequential role in Korean adolescents' motivation and performance at school. Surprisingly, however, few studies have tested the support from parents, teachers, and peers separately. The Korean literature is not an exception, with most studies taking social support from parents, teachers, and peers as a single factor (e.g., Min & Jang, 2013; So, 2008). To more fully understand the relative influence of the perceived support from these social figures on the motivation and learning of students, it is important that multiple sources of support be assessed and examined simultaneously within a single sample.

What Type of Support Is Most Conducive to Which Outcome?

Academic Support Versus Emotional Support

Even when students receive support from the same social agent at any given time, the effects of this support could still play out differently depending on what type of support each of them believes that she or he was provided with. In the past, investigators have assessed social support as either a global construct or a more specific construct that emphasized a particular type of support. Social support, belongingness, positive relationships, or teacher–student relationships (e.g., Wentzel, 1998) are examples of the former; emotional support, informative support, pedagogical caring, or intimacy (e.g., Ahmed, Minnaert, van der Werf, & Kuyper, 2010; Berndt, 1992) are examples of the latter. Neither, however, adequately represents the complex nature of the support adolescent students receive at home or school. Perhaps for this reason, previous research into social support has been criticized for its failure to clearly establish the various functions social support plays in the interpersonal relationships between students and significant others (Winemiller, Mitchell, Sutliff, & Cline, 1993).

Many researchers view academic support and emotional support as the two representative forms of social support that adolescents receive at school (H. Patrick et al., 2007). Perceived academic support is defined as the belief that significant others value and encourage student learning and progress by modeling, helping, and providing guidance and information when necessary. Perceived emotional support is the belief that significant others respect students as individuals and attend to their feelings and needs, by expressing empathy and concern about their personal well-being (Ahmed et al., 2010; Johnson, Johnson, & Anderson, 1983; H. Patrick et al., 2007). Students are capable of distinguishing between these two forms of social support; student ratings of academic and emotional support indicate that they are considered two independent factors, although they often correlate strongly with each other (e.g., Johnson et al., 1983; H. Patrick et al., 2007).

Both academic and emotional support are known to play unique roles in the prediction of student motivation, emotion, and learning. For example, perceived emotional support from parents significantly reduces the levels of anxiety experienced by students (Ahmed et al., 2010; Leung, Yeung, & Wong, 2010), but perceived academic support from parents does not (Leung et al., 2010), or may even increase it (Ahmed et al., 2010). Similarly, emotional support from teachers, while improving the psychological safety and emotional comfort students feel at school, does not necessarily contribute to their academic motivation (H. Patrick, Anderman, Ryan, Edelin, & Midgley, 2001). However, academic support from teachers enhances subject matter interest and achievement (Ahmed et al., 2010; Wentzel, 1998).

It thus appears that emotional support helps students primarily by reducing negative psychological responses, whereas academic support contributes more directly to student achievement by enhancing positive motivational and behavioral responses. Despite the recognition that the two types of support may play different roles in student motivation and performance (H. Patrick et al., 2007; Wentzel, 1997), direct evidence of this is scarce. It is still common practice to measure social support as a single construct and, even when subcomponents of support are assessed separately, excessively strong correlations between these subcomponents often force researchers to merge them into a single factor. Because we analyzed a longitudinal database in which perceived academic support and emotional support from parents and teachers were assessed independently for multiple years, we were able to study the simultaneous influence of the two types of social support on student motivation and achievement.

Achievement Pressure

We also examined achievement pressure from teachers in this study. Achievement pressure refers to the excessive demands imposed by significant others, such as parents and teachers, on students to perform at high levels (Levpušček & Zupančič, 2009). Whereas academic and emotional support embody positive forms of social influence, achievement pressure exemplifies a negative form of social support in terms of student motivation and achievement.

Owing to its Confucian tradition, Korean society puts a strong value on scholastic achievement (Bong et al., 2008). Adolescent members of society are the primary target of this achievement pressure because entering a leading university is an implicit prerequisite for improved employment opportunities and social recognition. Failing to do so is often followed by a stream of denied opportunities (Bong, 2003). Korean adolescents thus normally spend an enormous amount of time studying and suffer from extreme stress and sleep deprivation (M. Lee & Larson, 2000; Yang, Kim, Patel, & Lee, 2005). This stress can be summed up by the description of Korea as an "examination hell" (M. Lee & Larson, 2000). Noting this, Korean educational researchers have attempted to evaluate the influence of achievement pressure on the academic motivation and learning of Korean students, demonstrating that parental achievement pressure relates positively to both test anxiety (e.g., Jeong, Chung, & Lee, 2009) and academic achievement (e.g., Hong & Lee, 2012). This literature has almost exclusively focused on achievement pressure from parents; research related to achievement pressure from teachers is lacking.

Achievement pressure from teachers—in the form of a strong emphasis on grades, test scores, evaluation, and relative performance—is a salient and ubiquitous feature in a performance-oriented classroom (H. Patrick et al., 2001). A perceived focus on evaluation and harsh evaluation itself are negative predictors of intrinsic motivation in the classroom (Church, Elliot, & Gable, 2001). Achievement pressure also activates negative achievement emotions (Goetz, Pekrun, Hall, & Haag, 2006) and lowers self-efficacy and achievement (Levpušček & Zupančič, 2009). These findings have been replicated in studies with Korean learners in which perceived classroom goal structures were assessed in lieu of achievement pressure from teachers. Jeon, Bong, and Kim (2010), for instance, found that the perception of performance-oriented classroom goal structures predicted the test anxiety, negative classroom affect, personal performance-approach goals, and performance-avoidance goals of adolescent students. By testing both the positive and negative forms of social influence, we aimed to uncover the complex interrelationship social support has with student motivation and achievement.

Do Achievement Goals Mediate the Relationship Between Perceived Social Support and Either Test Anxiety or Academic Achievement?

Directly and indirectly, social support from parents, teachers, and peers contributes to student outcomes via student motivation. This theoretical stance agrees with that of Wentzel (1999), who argued that the socialization experiences of children and adolescents with their parents, teachers, and peers shape their social and academic motivational processes, and these motivational processes lead students to particular academic outcomes, most notably academic achievement. This motivational mediation of social support has been clearly demonstrated in previous studies (H. Patrick et al., 2007; Wentzel, 1998). In H. Patrick et al. (2007), for instance, emotional support and the promotion of student interaction by teachers, in addition to the academic support of peers, predicted students' use of self-regulation strategies and task-related interaction, the latter of which, in turn, predicted academic achievement. Most importantly, all predictive paths from the support variables to self-regulation and task-related interaction were mediated by the students' mastery goals and academic self-efficacy, whereas the path from the peers' academic support to task-related interaction was mediated by the students' social efficacy.

We selected test anxiety and academic achievement as outcome variables in this study for several reasons. First, test anxiety and academic achievement, respectively, represent important emotional and cognitive outcomes of the learning process. They also represent typical negative and positive responses in achievement settings. These contrasting characteristics make them highly promising variables for delineating the idiosyncratic effects, if any, associated with different types of support. Second, both have been predicted by students' perceptions of social support and achievement pressure (Ahmed et al., 2010; Demaray et al., 2005; Goetz et al., 2006; Leung et al., 2010), as well as students' personal achievement goals, in previous research (Bong, 2009; Church et al., 2001; Elliot & McGregor, 1999, 2001). These well-established links with social support and achievement goals situate test anxiety and academic achievement as particularly suitable measures when investigating the potential mediation of support-outcome relationships by achievement goals.

Achievement goals function as an interpretive cognitive framework for the messages learners receive in achievement contexts. These messages can be as explicit as achievement pressure (Goetz et al., 2006), parental achievement goals (Jiang et al., 2014), and classroom goal structures (Anderman & Anderman, 1999; Urdan, 2004), or as subtle as family cohesion (Wentzel, 1998) and informational support (Leung et al., 2010). Depending on the nature of these messages, students strive to master new skills and improve their competence (mastery goals), perform better than others and validate their competence (performance-approach goals), or avoid performing worse than others in an attempt to conceal their incompetence (performance-avoidance goals).

More specifically, when students perceive social support in the form of academic and emotional support from parents and teachers, positive interactions with peers, and a focus on learning and progress in the classroom, they are more likely to pursue mastery goals. Mastery-oriented learners are more intrinsically motivated, feel more self-efficacious and less anxious, and reach higher levels of achievement compared with those who are less mastery-oriented (Bong, 2009; Church et al., 2001; H. Patrick et al., 2007). Conversely, when students perceive achievement pressure in the form of high academic demands from parents and teachers, competition among peers, and a focus on ability and evaluation, they are more likely to pursue performance-approach goals, performance-avoidance goals, or both. These goals differ in their implications for test anxiety and achievement; students with performance-approach goals occasionally experience heightened levels of test anxiety, but more frequently demonstrate stronger academic performance than students without such goals. Learners

with performance-avoidance goals, in comparison, almost always exhibit lower intrinsic motivation, stronger test anxiety, and poorer academic performance (Church et al., 2001; Elliot & McGregor, 1999; Jiang et al., 2014; Middleton & Midgley, 1997). Our aim was to elucidate the routes through which different sources of social support affect important student outcomes, with personal achievement goals considered as a motivational mediator.

Does Social Support Function Differently for Girls and Boys?

Self-construals of women depend more on how they are connected to others, whereas those of men focus more on how they are independent from others (Cross & Madson, 1997). Social support—emotional support in particular—is also more important to women than men, a situation that leads to differences in the level of stress experienced and the type of coping strategies used by the two genders. Women find conflict in social relationships more stressful and seek more emotional support when in trouble than men do (Tamres, Janicki, & Helgeson, 2002). All available evidence thus suggests that social agents and the support they provide are of potentially greater importance for girls than boys.

Helsen, Vollebergh, and Meeus (2000) observed that perceived parental support decreased and perceived peer support increased between the ages of 12 and 16 years for both genders. Boys perceived consistently stronger support from parents than from peers during this period, whereas girls started to perceive stronger support from peers at around the age of 14. However, it was girls who benefitted more from perceived parental support when faced with emotional problems such as stress. In addition, although perceived parental support demonstrated a similar relationship with general psychological well-being for both girls and boys, its relationship with the emotional problems of girls was significantly more negative than it was with those of boys. In a similar vein, Goodenow (1993) found that teacher support correlated more strongly with the expectations for success in, and value attached to, specific school subjects among girls than it did among boys. Accordingly, we hypothesized that the motivation and achievement of the adolescent girls in this study would depend more heavily on the perceived support from adults, whereas those of the boys would be more affected by the perceived support from peers.

Present Study

In its basic conceptualization of the support–motivation–outcome link, the longitudinal model we tested in this study is consistent in many ways with those of Wentzel (1998) and H. Patrick et al. (2007). Nevertheless, there are important differences that make the present study unique, with novel contributions to the existing literature.

First, the perceived support from three social agents of particular importance for adolescents—parents, teachers, and peers—was assessed in this study. By including these sources of social influence in a single study, we were able to compare the relative contribution of each in the prediction of adolescent academic motivation and achievement. Based on the characteristics of the sample used in our study and previous findings that parents wield significant influence over a wide variety of adjustment indexes for adolescents (Feldlaufer et al., 1988; Midgley et al., 1989), one that is often stronger and wider-reaching than that of teachers or peers (Helsen et al., 2000; Ryan et al., 1994; Wentzel, 1998), we hypothesized that parental support would exhibit a significant predictive pathway to test anxiety, academic achievement, and achievement goals. Because previous studies have indicated that support from teachers or schools tends to more accurately predict school-related variables than parental support does (Demaray et al., 2005; Ryan et al., 1994), we expected that support from teachers might demonstrate stronger links to some of the variables under analysis. The limited evidence from previous studies made it difficult to generate hypotheses of any greater specificity.

Second, various forms of social support were also analyzed in this study. The literature suggests that both the source and the type of support affect adolescent motivation and achievement. In order to test this, academic support and emotional support from both parents and teachers were assessed, along with achievement pressure from teachers and perceived support from peers. Emotional difficulties in adolescents, such as anxiety, stress, or depression, are most effectively minimized when they perceive emotional support from their parents, whereas academic interest and achievement are most reliably improved by the academic support of teachers (Ahmed et al., 2010; Wentzel, 1998). Thus, we hypothesized that parental emotional support would more strongly predict student test anxiety, whereas teachers' academic support would more accurately predict student achievement goals and academic achievement than would other types of support.

Evidence is inconclusive about the exact role that peer support plays in adolescent academic motivation or achievement, indicating only that it appears less consequential than the support of parents or teachers (Ryan et al., 1994). As explained in the next section, the peer support construct assessed in this study is highly similar to emotional support from peers. We thus hypothesized, based on the observations of Demaray et al. (2005), that it would negatively predict the test anxiety of adolescent students. Jiang et al. (2014) observed that the perceived achievement goals of parents and peers were more predictive of achievement goals in Korean adolescents than were those of teachers, suggesting that peer support might also predict students' adoption of particular achievement goals. Because the peer support assessed in this study was neither a parallel nor the direct opposite of any of the achievement goals, no specific hypothesis was generated regarding the relationship between peer support and achievement goals.

We hypothesized the achievement pressure from teachers would be associated with an increase in test anxiety and a decrease in academic achievement (Goetz et al., 2006; Levpušček & Zupančič, 2009). Our hypothesis of a negative relationship between teacher pressure and student achievement was tentative, however, because the few available studies on teacher achievement pressure have documented a nonsignificant link between the two (S. Kim & Oh, 2014; J. Lee, 2012). We further hypothesized that achievement pressure from teachers would predict a student's adoption of performance-approach and performance-avoidance goals because of the strong focus on evaluation that achievement pressure shares with performance-oriented classroom goal structures (Church et al., 2001). By simultaneously examining adaptive and maladaptive forms of social influence on adolescents, we aimed to clarify their contrasting natures and the motivational mechanisms by which they primarily operate.

Third, we tested achievement goals as a mediator between social support and academic outcomes. Because achievement goals were compared with positive and negative forms of support (emotional support and achievement pressure, respectively) and positive and negative outcomes (achievement and test anxiety, respectively), the nature of each achievement goal would be easier to discern. For example, it remains unclear whether performance-approach goals represent an adaptive or maladaptive motivational orientation (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Midgley, Kaplan, & Middleton, 2001). Analyzing the antecedents and consequences of performance-approach goals would help understand the nature of these goals better.

Fourth, because we analyzed a longitudinal data set, it was possible to test the stability of each type of support provided by the social agents in question. More importantly, it was also possible to examine the stability of construct relations over time. Figure 1 presents a schematic of the model we tested. The first-year (Year 1) database included only test anxiety and achievement scores, which served as control variables for test anxiety and achievement assessed in subsequent years. Including these control variables in the model generated greater confidence in the present results because the paths leading to these two outcome variables were estimated in a highly conservative manner.

The second- and third-year databases (Year 2 and Year 3, respectively) included six types of perceived social support (parental academic support, parental emotional support, teacher academic support, teacher emotional support, teacher achievement pressure, and peer support), three achievement goals (mastery goals, performance-approach goals, and performance-avoidance goals), test anxiety, and academic achievement. Not only were we able to present a comprehensive picture on how social support predicted adolescent student motivation and performance over time, we were also able to show how these predictive relationships differed between girls and boys. We hypothesized that emotional support from both parents and teachers would show stronger negative paths to test anxiety for girls than for boys (Helsen et al., 2000; Tamres et al., 2002). In contrast, we hypothesized that peer support would more strongly predict the motivation of boys in general than it would for girls (Goodenow, 1993).

Potential differences related to culture notwithstanding, it was our judgment that none of the results obtained in this research would represent a phenomenon confined solely to Korean learning situations or Korean youth. Quite the contrary, we strongly believed that the effects of the multiple sources and types of perceived social support on the motivation and achievement of the present sample of Korean adolescents would be similar to those for adolescent samples from other cultures, with possible sociocultural differences reflected in the relative strength, rather than the nature, of the effects.

Method

Data Source and Sample

The present study used the Korean Educational Longitudinal Study 2005 (KELS 2005; Y. Kim et al., 2007) database. KELS 2005 is a longitudinal survey conducted by the Korean Educational Development Institute (KEDI) each December near the end of the school year in Korea. An academic year in Korean schools starts on the second day of March and ends on the last day of February the following calendar year. The first semester runs from March to the middle of July. The second semester runs from the middle of August to December, with an additional 2 weeks in February. Korea has a 6–3–3 education system, with 6 years of elementary school and 3 years each of middle and high school education.

In 2005, seventh-grade students from 150 public and private middle schools across the nation were randomly selected by stratified cluster random sampling. Fifty students were selected from each school to participate in the survey (N = 6,908). KEDI plans to follow these participants for 19 years until they reach adulthood. KELS 2005 assesses variables related to the home environment, the learning environment, school characteristics, psychological aspects, attitudes toward learning, and educational achievement.

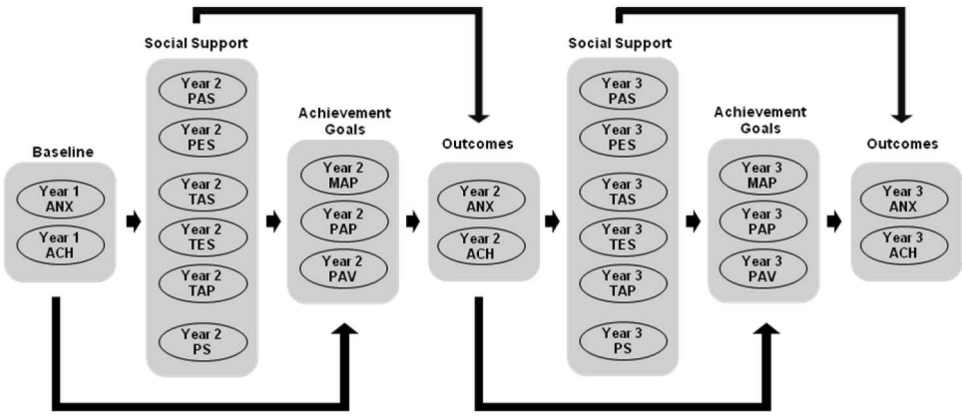

Figure 1. A schematic representation of the complete model. For clarity, stability paths and disturbance terms are not presented. ANX = test anxiety; ACH = academic achievement; PAS = parental academic support; PES = parental emotional support; TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure; PS = peer support; MAP = mastery goals; PAP = performance-approach goals; PAV = performance-avoidance goals.

Detailed information on KELS 2005 can be found in Y. Kim et al. (2007).

We analyzed the first three waves of the KELS 2005 data, which followed the middle school freshman cohort (Grade 7) for 3 years until they became seniors (Grade 9). The normal age range for this cohort was from 13 years to 15 years and 11 months. We were particularly interested in this age group because Grade 7 in Korea is when students make the transition to middle school. Middle school adolescents are subject to evolving social relationships with their parents, teachers, and peers, rendering them an ideal sample with which to study the differing roles of social support from these multiple agents. They also start experiencing many changes in the classroom environment, such as an increased emphasis on grades and competition. Still, unlike Korean high school students, who (with few exceptions) suffer from immense achievement pressure and stress because of concerns about their imminent entrance into university, middle school students do not need to face these extreme challenges for a few more years. We conjectured that if adolescents indeed alter their academic motivation and performance by reacting to the source and type of social support that they receive, these differences would emerge more clearly among middle school students than among high school students.

The present study included students who satisfied two criteria. First, a student had to respond to every questionnaire that included the measures we used in this study. Second, a student had to take the standardized achievement tests in mathematics, English, and Korean in all 3 years. The final sample size was $N = 6{,}089$, of which 51.8% were boys (3,156 boys, 2,933 girls).

Measures

The KELS 2005 database included measures of social support, achievement goals, and test anxiety, along with scores from the national standardized achievement tests. Students responded to the social support and test anxiety items on a 5-point Likert-type scale (1 = *strongly disagree*, 5 = *strongly agree*) and achievement goal items on a 4-point Likert-type scale (1 = *strongly disagree*, 4 = *strongly agree*). All items referred to school learning in general. Table 1 shows the means and standard deviations, and Table 2 provides the reliability coefficients for the measures.

Perceived support from parents. KELS 2005 included eight items assessing students' perceptions of parental academic support and two items assessing those of parental emotional support. Appendix A presents all items with factor loadings from the Year 2 and Year 3 data. All items for parental academic support and emotional support loaded on their respective factors with no serious cross-loading.

Perceived support and achievement pressure from teachers. We used four items for perceived academic support from teachers, six items for perceived emotional support from teachers, and five items for perceived achievement pressure from teachers. All items referred to "my teacher," and students were instructed to think of the teachers in their school in general. A small number of the items were worded, however, in such a way that their homeroom teacher was likely to be the basis of their answer (e.g., "My teacher emphasizes that our class should rank high on regular examinations"). Homeroom teachers in the context of Korean secondary

Table 1
Means, Standard Deviations, and Results of Mixed ANOVAs

	Whole sample		Boys		Girls		*F* value		
Variable	*M*	*SD*	*M*	*SD*	*M*	*SD*	Year	Gender	Y × G
PAS2	3.04	0.66	3.12	0.66	2.97	0.65	143.68**	89.67**	.27
PAS3	2.95	0.69	3.01	0.70	2.87	0.68			
PES2	3.47	0.90	3.45	0.89	3.48	0.92	17.95**	4.96	2.55
PES3	3.41	0.96	3.38	0.96	3.45	0.96			
TAS2	3.32	0.81	3.37	0.87	3.28	0.74	222.61**	34.67**	.62
TAS3	3.49	0.77	3.54	0.82	3.44	0.70			
TES2	2.88	0.73	2.97	0.75	2.78	0.69	4.39	161.32**	.08
TES3	2.90	0.71	3.00	0.74	2.80	0.66			
TAP2	3.28	0.81	3.33	0.81	3.23	0.81	351.72**	33.73**	1.03
TAP3	3.51	0.68	3.54	0.72	3.47	0.65			
PS2	3.58	0.66	3.54	0.69	3.62	0.62	15.20**	25.76**	1.77
PS3	3.62	0.65	3.59	0.67	3.65	0.61			
MAP2	2.91	0.59	2.92	0.61	2.90	0.57	42.41**	.34	7.64*
MAP3	2.86	0.59	2.84	0.62	2.87	0.57			
PAP2	2.85	0.66	2.87	0.68	2.82	0.64	83.19**	3.59	6.80*
PAP3	2.76	0.65	2.76	0.67	2.76	0.64			
PAV2	2.39	0.66	2.39	0.69	2.39	0.63	.40	.17	.00
PAV3	2.39	0.68	2.39	0.70	2.38	0.65			
ANX1	3.12	0.94	3.15	0.95	3.09	0.92	402.18**	4.87	2.28
ANX2	3.08	0.85	3.10	0.87	3.07	0.83			
ANX3	2.81	0.82	2.82	0.84	2.80	0.81			
ACH1	299.85	51.61	293.82	52.64	306.34	49.68	84289.32**	138.60**	18.61**
ACH2	399.35	59.53	390.46	60.69	408.92	56.73			
ACH3	511.98	53.59	505.40	53.78	519.05	52.48			

Note. PAS = parental academic support; PES = parental emotional support; TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure; PS = peer support; MAP = mastery goals; PAP = performance-approach goals; PAV = performance-avoidance goals; ANX = test anxiety; ACH = academic achievement; 1 = Year 1; 2 = Year 2; 3 = Year 3; Y × G = interaction between year and gender.
* $p < .01$. ** $p < .001$.

Table 2
Correlation Coefficients Among Latent Variables and Reliability Estimates of Scales

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1. ANX1	91																						
2. ACH1	−07	—																					
3. PAS2	09	23	82																				
4. PES2	**−02**	18	58	80																			
5.TAS2	**−01**	**02**	21	26	89																		
6.TES2	**−01**	**−04**	26	27	67	85																	
7. TAP2	06	**03**	11	05	08	**02**	73																
8. PS2	**−03**	13	25	31	33	33	16	81															
9. MAP2	05	25	26	24	23	16	13	19	80														
10. PAP2	17	11	25	14	12	11	13	11	55	80													
11. PAV2	21	**−00**	09	**−00**	05	05	08	−05	28	52	83												
12. ANX2	46	**−01**	18	**02**	05	04	12	**−02**	17	35	38	91											
13. ACH2	−06	92	22	21	08	**00**	**03**	15	30	15	**03**	**00**	—										
14. PAS3	07	25	62	33	12	16	05	18	19	19	07	15	25	84									
15. PES3	−04	17	32	52	16	16	**02**	21	19	12	**03**	**02**	19	56	82								
16. TAS3	**−03**	**00**	12	16	41	34	**03**	18	15	07	**03**	**02**	07	17	23	89							
17. TES3	**−01**	−06	15	17	36	42	**00**	15	12	06	05	**03**	**−01**	22	24	67	87						
18. TAP3	08	08	09	06	**02**	**−01**	24	14	06	06	**04**	07	06	11	07	09	**−03**	72					
19. PS3	−04	14	17	20	18	11	05	41	14	07	**−02**	**−01**	17	23	28	34	34	21	83				
20. MAP3	**00**	28	22	20	19	15	08	16	47	30	15	10	32	27	26	22	19	09	20	80			
21. PAP3	13	16	21	09	07	06	11	08	34	48	29	23	18	24	15	09	09	12	08	57	81		
22. PAV3	18	05	09	**−01**	**01**	**02**	07	**−03**	17	30	36	28	**03**	15	07	04	07	08	−05	31	64	85	
23. ANX3	40	−06	11	**−01**	04	04	09	−04	10	24	28	53	−04	20	**02**	04	09	11	−06	12	28	36	92
24. ACH3	−06	84	20	19	08	**01**	**03**	16	28	14	05	**02**	88	24	21	09	**01**	06	16	36	19	**04**	**−02**

Note. All coefficients are statistically significant at $p < .01$, except for those in bold. Reliability coefficients are presented along the diagonal. PAS = parental academic support; PES = parental emotional support; TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure; PS = peer support; MAP = mastery goal; PAP = performance-approach goal; PAV = performance-avoidance goal; ANX = test anxiety; ACH = academic achievement; 1 = Year 1; 2 = Year 2; 3 = Year 3.

schools are viewed as surrogate parents while students are at school (B. Lee & Jeung, 2006). They exercise enormous influence on the motivation and achievement of students in their homeroom classes (Bong, Hwang, & Song, 2010). We thus determined that the wording was appropriate and even desirable for the purposes of the present research.

In KELS 2005, the four teacher academic support items were called "students' perceptions of their teachers' passion and knowledge." Prior research has demonstrated that students are positively motivated when they believe their teacher demonstrates an enthusiasm for learning and a passion for teaching (B. C. Patrick, Hisley, & Kempler, 2000). Therefore, we treated these items as measuring, if only indirectly, perceived academic support from teachers.

Appendix B presents all items with factor loadings from the Year 2 and Year 3 data. All items clearly loaded on their respective factors with no cross-loading, except for TAP1 ("My teacher wants students to study hard"), which did not load on any of the factors. This item was subsequently deleted from the analysis.

Perceived support from peers. There were four items assessing students' perceptions of peer support and positive relationships among peers. These items were, "Students get along well in my school," "It is easy to make friends in my school," "My peers at school respect and care about me," and "I can solicit my peers' help when performing difficult tasks." Except possibly for the last statement, these items generally describe emotional support from peers. They formed a single peer support factor in exploratory factor analysis.

Achievement goals. KELS 2005 includes nine achievement goal items based on Elliot and McGregor (2001). There were three items each for mastery goals (e.g., "I want to learn as much as possible in class"), performance-approach goals (e.g., "My goal in class is to get a better grade than other students"), and performance-avoidance goals (e.g., "I study in class to avoid doing poorly compared to other students").

Test anxiety. The following nine items assessed test anxiety: "I become anxious during the midterm or final exam period," "I cannot study because I am worried about test scores," "I cannot concentrate on my test when I think about getting a bad score," "I become agitated while taking a test," "I still get anxious about a test even when I am thoroughly prepared," "During exams, I get headaches or an upset stomach due to nervousness," "I worry about failing while taking a test," "I cannot get over my worries about an exam even after it is over," and "While taking a test, I go blank because I get too anxious."

Academic achievement. We used scores from the standardized achievement tests in Korean, English, and mathematics administered by KEDI with the KELS 2005 survey. KEDI made statistical adjustments to these scores, so they could be readily used in conjunction with the KELS 2005 survey data (G. Lee, Kang, Noh, Yu, & Lew, 2006).

Results

Mean-Level Differences Across School Year and Gender

Missing data present potential problems in most large-scale data sets (Graham, 2009). This was not the case, however, with KELS

2005. The rate of no responses ranged from 0.1% to 1.9% for the survey items and from 0.0% to 2.2% for the achievement tests. We thus used the expectation-maximization algorithm for the imputation of missing data. To test the differences in mean levels across school year and gender, and a possible interaction between the two variables, we performed a Year × Gender mixed analysis of variance (ANOVA), using SPSS 12.0. To guard against the possibility of obtaining a statistically significant result purely because of the large sample size, we set the a priori alpha level at the more conservative .01 rather than the usual .05.

As reported in Table 1, perceived parental academic support was significantly higher in Year 2 than in Year 3, $F(1, 6087) = 143.68$, $p < .001$, and for boys than for girls, $F(1, 6087) = 89.67$, $p < .001$. Perceived parental emotional support was also significantly higher in Year 2 than in Year 3, $F(1, 6087) = 17.95$, $p < .001$, but showed little variation between genders. Perceived academic support from teachers was significantly higher in Year 3 than in Year 2, $F(1, 6087) = 222.61$, $p < .001$, and for boys than for girls, $F(1, 6087) = 34.67$, $p < .001$. Perceived emotional support from teachers did not differ between school years but was significantly higher for boys than for girls, $F(1, 6087) = 161.32$, $p < .001$. Perceived achievement pressure from teachers was significantly higher in Year 3 than in Year 2, $F(1, 6087) = 351.72$, $p < .001$, and for boys than for girls, $F(1, 6087) = 33.73$, $p < .001$. Perceived support from peers was also significantly higher in Year 3 than in Year 2, $F(1, 6087) = 15.20$, $p < .001$, and for girls than for boys, $F(1, 6087) = 25.76$, $p < .001$. None of the interactions between school year and gender were significant for the support variables.

Regarding the three achievement goals, mastery goals were significantly higher in Year 2 than in Year 3, $F(1, 6087) = 42.41$, $p < .001$. The interaction between school year and gender was also significant, $F(1, 6087) = 7.64$, $p < .01$. Scores for mastery goals declined with school year for both genders but the dip was greater for boys than for girls. Performance-approach goals were also significantly higher in Year 2 than in Year 3, $F(1, 6087) = 83.19$, $p < .001$, again with a significant interaction between school year and gender, $F(1, 6087) = 6.80$, $p < .01$. As with mastery goals, compared with girls, boys demonstrated a greater drop in their performance-approach goal scores in Year 3. There was no significant school-year difference or interaction between school year and gender in performance-avoidance goals. None of the overall gender differences were significant for any of the achievement goals.

Unexpectedly, test anxiety decreased across school years for both genders, $F(2, 12174) = 402.18$, $p < .001$, with no significant interaction between school year and gender. By contrast, achievement scores increased across school years, $F(2, 12174) = 84289.32$, $p < .001$, with girls maintaining significantly higher test scores compared with boys, $F(1, 6087) = 138.60$, $p < .001$. The gender gap was wider in Year 2 compared with that in Year 1 or Year 3, which rendered the interaction between school year and gender for achievement scores significant, $F(2, 12174) = 18.61$, $p < .001$.

Latent Variable Analysis

Before testing the hypothesized predictive relationships with structural equation modeling (SEM), we first checked the measurement properties and bivariate correlations among the latent variables with confirmatory factor analysis (CFA) using AMOS 16.0. Multiple goodness-of-fit indexes were consulted to evaluate the fit of the CFA and SEM models, which included chi-square statistics, the Tucker-Lewis Index (TLI), the comparative fit index (CFI), and root mean square error of approximation (RMSEA). For the CFI and the TLI, values above .90 were taken as evidence of an acceptable model fit (Hu & Bentler, 1999). For RMSEA, values below .05 were taken to indicate an excellent fit, and those between .05 and .08 indicate a reasonable fit (Browne & Cudeck, 1993).

Tests of measurement models. We performed a CFA with all latent variables. Because the same survey items were used repeatedly across different school years for each construct, we incorporated correlated error paths between the same items measured at various times to more accurately model construct relations (Pitts, West, & Tein, 1996). This initial model demonstrated an acceptable fit, $\chi^2(5545, N = 6089) = 37017.751$, $p < .001$ (CFI = .910, TLI = .902, RMSEA = .031). However, modification indexes consistently suggested that the errors of three pairs of items were correlated. Upon inspection, we decided that each pair shared sufficient similarity in wording or content to justify the additional error covariance paths. Three error covariance paths were therefore added one at a time between the following item pairs: "I cannot study because I am worried about test scores" and "I cannot concentrate on my test when I think about getting a bad score" on test anxiety; "My parents check my schoolwork and homework assignments" and "My parents personally teach me" on perceived parental academic support; and "My teacher understands students from students' point of view" and "My teacher never ignores students' opinions" on perceived emotional support from teachers. The final measurement model displayed an improved fit for the data, $\chi^2(5538, N = 6089) = 31064.017$, $p < .001$ (CFI = .927, TLI = .921, RMSEA = .028). All factor loadings, factor variances, and error variances were significant at $p < .001$.

Table 2 presents the correlation coefficients for the latent variables. Several findings are noteworthy. All support variables correlated positively with one another in any given year, regardless of the source. The correlation coefficients ranged between $.17 \leq rs \leq .27$ for the parental support and teacher support variables, $.23 \leq rs \leq .31$ for the parental support and peer support variables, and $.33 \leq rs \leq .34$ for the teacher support and peer support variables. The correlation coefficients were stronger when the support came from the same source: $rs = .58$ in Year 2 and .56 in Year 3 between perceived parental academic support and perceived parental emotional support, and $rs = .67$ in both Year 2 and Year 3 between perceived teacher academic support and perceived teacher emotional support.

Although all types of perceived social support correlated positively with the two approach goals, parental academic support was the only support variable that exhibited comparable correlations with both mastery goals and performance-approach goals in both Year 2 ($rs = .26$ and .25, respectively) and Year 3, ($rs = .27$ and .24, respectively). All other support variables demonstrated noticeably stronger correlations with mastery goals than they did for performance-approach goals. The correlation coefficients for parental emotional support with mastery goals and performance-approach goals were, respectively, $rs = .24$ and .14 in Year 2 and $rs = .26$ and .15 in Year 3; for teacher academic support, they were

*r*s = .23 and .12 in Year 2 and *r*s = .22 and .09 in Year 3; for teacher emotional support, they were *r*s = .16 and .11 in Year 2 and *r*s = .19 and .09 in Year 3; and for peer support, they were *r*s = .19 and .11 in Year 2 and *r*s = .20 and .08 in Year 3.

Perceived parental academic support was also the only support variable that produced relatively sizable correlation coefficients with both test anxiety (*r*s = .18 in Year 2 and .20 in Year 3) and academic achievement (*r*s = .22 in Year 2 and .24 in Year 3). Perceived parental emotional support showed correlation coefficients comparable with those of parental academic support with academic achievement (*r*s = .21 in both Year 2 and Year 3), but did not correlate significantly with test anxiety in any of the school years. Similarly, perceived peer support correlated with academic achievement (*r*s = .15 in Year 2 and .16 in Year 3), but not test anxiety (*r*s = −.02, $p > .01$ in Year 2 and −.06 in Year 3). Whereas the correlation coefficients between the teacher support and pressure variables and test anxiety or academic achievement were generally weak, teacher achievement pressure displayed modest correlations with test anxiety (*r*s = .12 in Year 2 and .11 in Year 3).

Mastery goals and performance-approach goals correlated substantially with each other (*r*s = .55 in Year 2 and .57 in Year 3), as did performance-approach goals and performance-avoidance goals (*r*s = .52 in Year 2 and .64 in Year 3). Test anxiety showed particularly conspicuous correlations with both performance-approach goals (*r*s = .35 in Year 2 and .28 in Year 3) and performance-avoidance goals (*r*s = .38 in Year 2 and .36 in Year 3), whereas academic achievement correlated with mastery goals (*r*s = .30 in Year 2 and .36 in Year 3).

Tests of structural models. Predictive and stability paths for the latent variables from one year to the next were specified. Each survey item functioned as an indicator of its respective latent variable. Scores in the three subject tests were used as indicators of academic achievement. We hypothesized that perceived social support and pressure from parents, teachers, and peers would predict test anxiety and academic achievement both directly and indirectly through personal achievement goals each year. Figure 1 presents the model structure.

In testing the predictive relationships, we controlled for the test anxiety and academic achievement assessed in the previous year because prior levels of achievement and anxiety could affect subsequent perceptions of social support, motivation, and achievement. Table 3 presents the coefficients for these paths. Several paths were consistently observed in each of the school years. Test anxiety in the previous year predicted parental academic support and students' personal performance-approach and performance-avoidance goals in the following year. Academic achievement in the previous year predicted parental academic support, parental emotional support, peer support, personal mastery goals, and performance-approach goals.

We also controlled for the effects of the same variable assessed in the previous year by specifying stability paths. Consequently, the coefficients for the predictive paths obtained in this study represent estimates that are conservative yet highly unlikely to have occurred by chance. Modification indexes suggested that the disturbance terms of the parental academic and emotional support variables, of the teacher academic and emotional support variables, and of the performance-approach and performance-avoidance goal

Table 3
Standardized Coefficients for the Paths From Previous Test Anxiety and Achievement to Subsequent Variables

	Year 2										
	PAS	PES	TAS	TES	TAP	PS	MAP	PAP	PAV	ANX	ACH
Year 1 predictor											
Test anxiety											
Whole sample	.11**	−.01	−.01	−.01	.07**	−.02	.06**	.15**	**.20****	—	−.00
Boys	.11**	−.01	−.01	−.01	.07**	−.02	.06**	.15**	**.16****	—	−.00
Girls	.10**	−.01	−.01	−.01	.06**	−.02	.06**	.15**	**.24****	—	−.00
Academic achievement											
Whole sample	.24**	.19**	.04	−.02	.04	.14**	.21**	.08**	.02	−.01	—
Boys	.27**	.19**	.05**	−.00	.05*	.14**	.21**	.09**	.02	−.02	—
Girls	.26**	.18**	.06**	−.00	.05*	.15**	.21**	.09**	.02	−.02	—
	Year 3										
Year 2 predictor											
Test anxiety											
Whole sample	.05**	.01	−.00	.02	.04	−.00	.02	.08**	.15**	—	.02
Boys	.05**	.01	.00	.02	.03	−.01	.02	.08**	.15**	—	.02
Girls	.05**	.01	.00	.02	.04	−.01	.02	.08**	.15**	—	.02
Academic achievement											
Whole sample	.12**	.09**	.04*	−.01	.07**	.11**	.17**	.10**	.03	−.08**	—
Boys	.14**	.09**	.04*	.01	.07**	.11**	.17**	.10**	.02	−.08**	—
Girls	.13**	.09**	.05*	.01	.08**	.11**	.17**	.10**	.02	−.08**	—

Note. Coefficients in bold indicate a significant gender difference at $p < .01$. PAS = parental academic support; PES = parental emotional support; TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure; PS = peer support; MAP = mastery goal; PAP = performance-approach goal; PAV = performance-avoidance goal; ANX = test anxiety; ACH = academic achievement.
* $p < .01$. ** $p < .001$.

variables should be correlated, a suggestion that was consistent with theory. A final model with the three disturbance covariation paths fit the data well, $\chi^2(5682, N = 6089) = 36649.579$, $p < .001$ (CFI = .911, TLI = .906, RMSEA = .030).

Tests of gender invariance. To examine the moderating effect of gender, we conducted multigroup analysis. We first examined the measurement invariance model by constraining the factor loadings to be equal between the boy and girl groups. The purpose of this analysis was to make sure that differences observed later in the structural paths were not because of the items functioning differently according to gender. Values of the goodness-of-fit indexes for this measurement invariance model, $\chi^2(11450, N = 6089) = 42929.374$, $p < .001$ (CFI = .910, TLI = .906, RMSEA = .021), were comparable with those of the unconstrained model, $\chi^2(11364, N = 6089) = 42677.231$, $p < .001$ (CFI = .910, TLI = .905, RMSEA = .021), indicating that the items functioned similarly across the two genders (Kline, 2011). Next, additional invariance constraints were imposed on all of the structural paths to determine which paths differed significantly between boys and girls. For any that did, we removed the equality constraint on that particular path and reestimated the model. We repeated this procedure until no significant differences remained. The final model, with 15 independently estimated paths for the boy and girl groups, demonstrated satisfactory goodness-of-fit indexes, $\chi^2(11560, N = 6089) = 43071.741$, $p < .001$ (CFI = .910, TLI = .906, RMSEA = .021). The coefficients for the boy and girl groups from the multigroup analysis are presented alongside those from the whole-sample analysis in each table.

Temporal stability of latent variables. Table 4 presents the stability path coefficients for each variable. All perceived support and pressure variables in Year 2 significantly predicted the corresponding variables in Year 3 ($.23 \leq \beta s \leq .58$). Significant gender differences were also observed in all stability paths associated with the support variables, except for teacher achievement pressure. In all cases in which there existed a gender difference, the perceptions of girls of the social support they received from parents, teachers, and peers ($.42 \leq \beta s \leq .64$) were significantly more stable than those of boys ($.33 \leq \beta s \leq .51$).

Achievement goals in Year 2 also significantly predicted corresponding achievement goals in Year 3 ($.27 \leq \beta s \leq .36$). Again, significant gender differences were detected in the two performance goals. Both the performance-approach ($\beta = .44$) and performance-avoidance goals of girls ($\beta = .32$) were significantly more stable than those of boys ($\beta s = .32$ for performance-approach goals; .23 for performance-avoidance goals). The stability of test anxiety was also stronger for girls than for boys in both years ($\beta s = .44$ for girls vs. .33 for boys from Year 1 to Year 2; .50 for girls vs. .40 for boys from Year 2 to Year 3). Academic achievement demonstrated by far the strongest stability coefficients ($\beta s = .92$ from Year 1 to Year 2; .87 from Year 2 to Year 3).

Table 4
Standardized Coefficients for the Stability Paths

Variable	Year 1 → Year 2	Year 2 → Year 3
Test anxiety	**.38*/.33*/.44***	**.45*/.40*/.50***
Academic achievement	.92*/.90*/.93*	**.87*/.84*/.90***
Parental academic support	—	**.58*/.51*/.64***
Parental emotional support	—	**.51*/.45*/.57***
Teacher academic support	—	**.37*/.34*/.42***
Teacher emotional support	—	**.39*/.33*/.46***
Teacher achievement pressure	—	.23*/.22*/.24*
Peer support	—	**.40*/.36*/.45***
Mastery goal	—	.36*/.36*/.38*
Performance-approach goal	—	**.37*/.32*/.44***
Performance-avoidance goal	—	**.27*/.23*/.32***

Note. Coefficients for the whole sample are reported first, followed by those for boys, and then those for girls from the multigroup analysis. Coefficients in bold indicate significant gender differences at $p < .01$.
* $p < .001$.

Perceived social support and achievement goals as predictors of test anxiety and academic achievement. Table 5 shows the coefficients for the direct paths from social support and achievement goals to test anxiety and academic achievement within each year. Figure 2a illustrates the significant direct paths from social support to test anxiety and academic achievement. Parental academic support positively predicted test anxiety in both Year 2 ($\beta = .12$) and Year 3 ($\beta = .14$). Its predictive paths to test anxiety were significantly stronger for boys than for girls in both Year 2 ($\beta s = .16$ and .08, respectively) and Year 3 ($\beta s = .17$ and .13, respectively). Parental academic support did not directly predict academic achievement in either school year. Parental emotional support, on the other hand, negatively predicted test anxiety in both Year 2 ($\beta = -.06$) and Year 3 ($\beta = -.07$). It also positively and directly predicted academic achievement in Year 2 ($\beta = .03$) but not in Year 3. Therefore, our hypothesis regarding the relationship between parental support and both test anxiety and achievement was supported only in regard to parental emotional support.

Teacher academic support did not relate to test anxiety but had a positive relationship with academic achievement in Year 2 ($\beta = .04$), consistent with our hypothesis. Contrary to our expectations, however, teacher emotional support related positively to test anxiety in Year 3 ($\beta = .07$). Our hypothesis that parental emotional support would predict test anxiety more strongly than that of teachers was thus supported. Also as hypothesized, teacher achievement pressure demonstrated a positive relationship with test anxiety in both Year 2 ($\beta = .06$) and Year 3 ($\beta = .07$). However, neither teacher emotional support nor teacher achievement pressure predicted academic achievement directly. Peer support related negatively to test anxiety in both Year 2 ($\beta = -.04$) and Year 3 ($\beta = -.08$), consistent with our hypothesis. Unsurprisingly, peer support did not directly predict academic achievement. None of our hypotheses regarding gender differences received support.

Figure 2b illustrates the significant direct paths from achievement goals to test anxiety and academic achievement. Mastery goals did not relate to test anxiety in either school year but instead related positively to academic achievement in both Year 2 ($\beta = .04$) and Year 3 ($\beta = .07$). In contrast, both performance-approach and performance-avoidance goals positively related to test anxiety in both Year 2 ($\beta s = .14$ and .21, respectively) and Year 3 ($\beta s = .05$ and .17, respectively). Neither performance-approach goals nor performance-avoidance goals predicted academic achievement in any of the school years.

Perceived social support as predictors of achievement goals. Table 6 presents the coefficients for the paths from social support to achievement goals for each year. The predictive pattern was

Table 5
Standardized Coefficients for the Paths From Social Support and Achievement Goals to Test Anxiety and Academic Achievement

Predictor	Test anxiety		Academic achievement	
	Year 2	Year 3	Year 2	Year 3
Parental academic support	**.12**/.16**/.08****	**.14**/.17**/.13****	−.03/−.02/−.02	−.01/−.01/−.01
Parental emotional support	−.06**/−.06**/−.07**	−.07**/−.07**/−.07**	.03*/.03/.03	.03/.03/.03
Teacher academic support	.02/.02/.02	−.01/−.01/−.01	.04*/.04*/.04*	.03/.03/.02
Teacher emotional support	.00/.00/.00	.07**/.08**/.07**	−.02/−.01/−.01	−.02/−.01/−.01
Teacher achievement pressure	.06**/.06**/.06**	.07**/.08**/.07**	−.01/−.01/−.01	−.01/−.01/−.01
Peer support	−.04*/−.04*/−.04*	−.08**/−.08**/−.08**	.01/.00/.00	−.01/−.01/−.01
Mastery goals	.01/.01/.01	−.00/−.00/−.00	.04**/.05**/.05**	.07**/.07**/.07**
Performance-approach goals	.14**/.14**/.15**	.05*/.05*/.05*	−.01/−.00/−.00	.00/.01/.01
Performance-avoidance goals	.21**/.21**/.20**	.17**/.17**/.17**	.03/.03/.03	−.04/−.04/−.03

Note. Coefficients from the whole sample are reported first, followed by those for boys, and then those for girls from the multigroup analysis. Coefficients in bold indicate significant gender differences at $p < .01$.
* $p < .01$. ** $p < .001$.

highly consistent, with no noticeable change between school years or differences between the genders. Figure 2c presents the indirect paths from social support to test anxiety and academic achievement as mediated by achievement goals. Parental academic support positively predicted all three achievement goals in both Year 2 (βs = .12, .21, and .10 for mastery, performance-approach, and performance-avoidance goals, respectively) and Year 3 (βs = .10, .12, and .10, respectively). In contrast, parental emotional support positively predicted only mastery goals in both years (βs = .08 in Year 2 and .06 in Year 3) and negatively predicted performance-avoidance goals in Year 2 (β = −.05).

Teacher academic support positively predicted the two approach goals for the entire sample (βs = .17 for mastery goals and .07 for performance-approach goals) and also the performance-avoidance goals of girls (β = .14) in Year 2. It predicted only mastery goals but not performance goals in Year 3 (β = .08). Teacher emotional support predicted only the performance-avoidance goals of boys in Year 2 (β = .09). However, it predicted mastery goals (β = .05) and performance-avoidance goals (β = .07) for the entire sample in Year 3. Our hypothesis that teacher academic support would predict achievement goals more strongly than parental support was therefore refuted.

Similar to parental academic support, teacher achievement pressure positively predicted all achievement goals in both Year 2 (βs = .10, .10, and .07 for mastery, performance-approach, and performance-avoidance goals, respectively) and Year 3 (βs = .04, .09, and .07, respectively). Overall, though, the coefficients were generally weaker than those associated with parental academic support. Our hypothesis that achievement pressure from teachers would predict the two performance-oriented goals thus received partial support because it did predict mastery goals. Peer support positively predicted mastery goals (β = .05) and negatively predicted performance-avoidance goals in Year 2 (β = −.08). It continued to negatively predict performance-avoidance goals in Year 3 (β = −.09).

Tests of mediation effects. We tested the significance of specific meditational paths linking the social support variables to test anxiety and academic achievement via achievement goals using the phantom model approach (Macho & Ledermann, 2011). For this, a phantom model representing each indirect effect is added to the main model and tested for its significance using the bias-corrected percentile bootstrap method based on 1,000 randomly selected samples with 95% confidence intervals. All indirect paths from the social support variables to test anxiety and academic achievement were examined when they were connected significantly to each other via achievement goals. Table 7 summarizes the mediational effects of achievement goals between the social support and outcome variables. Indirect paths judged significant by the bootstrapping method linking social support to test anxiety and academic achievement via achievement goals are presented in bold in Figure 2c.

Discussion

Adolescents interact with a range of social agents both at home and at school. The most influential of these agents are parents, teachers, and peers. These groups independently provide adolescent students with various types of support, most notably academic and emotional. The type of support and who it is delivered by has important ramifications for the motivation and achievement of students. The present study follows earlier studies that found perceived support that is primarily instrumental and informative in nature plays a different role to more personal and emotional support (Ahmed et al., 2010; Leung et al., 2010). The current results also corroborated on a general level the observations of Wentzel (1998) and H. Patrick et al. (2007), who found that the motivational beliefs of students function as an important link between their perceptions of social support and tangible learning outcomes. By examining the relationships that distinct types of support from various social agents maintained with student motivation and achievement over 2 academic years, we extended previous findings on several important fronts.

Parents as the Strongest Source of Perceived Support for Adolescents

As previously documented (Berndt, 1979; Ryan et al., 1994), the perceived support from parents decreased and that from people outside the family (especially friends) increased during middle school years. Also consistent with previous reports (Demaray et al., 2005; Helsen et al., 2000; Ryan et al., 1994; Wentzel, 1998), perceived academic and emotional support

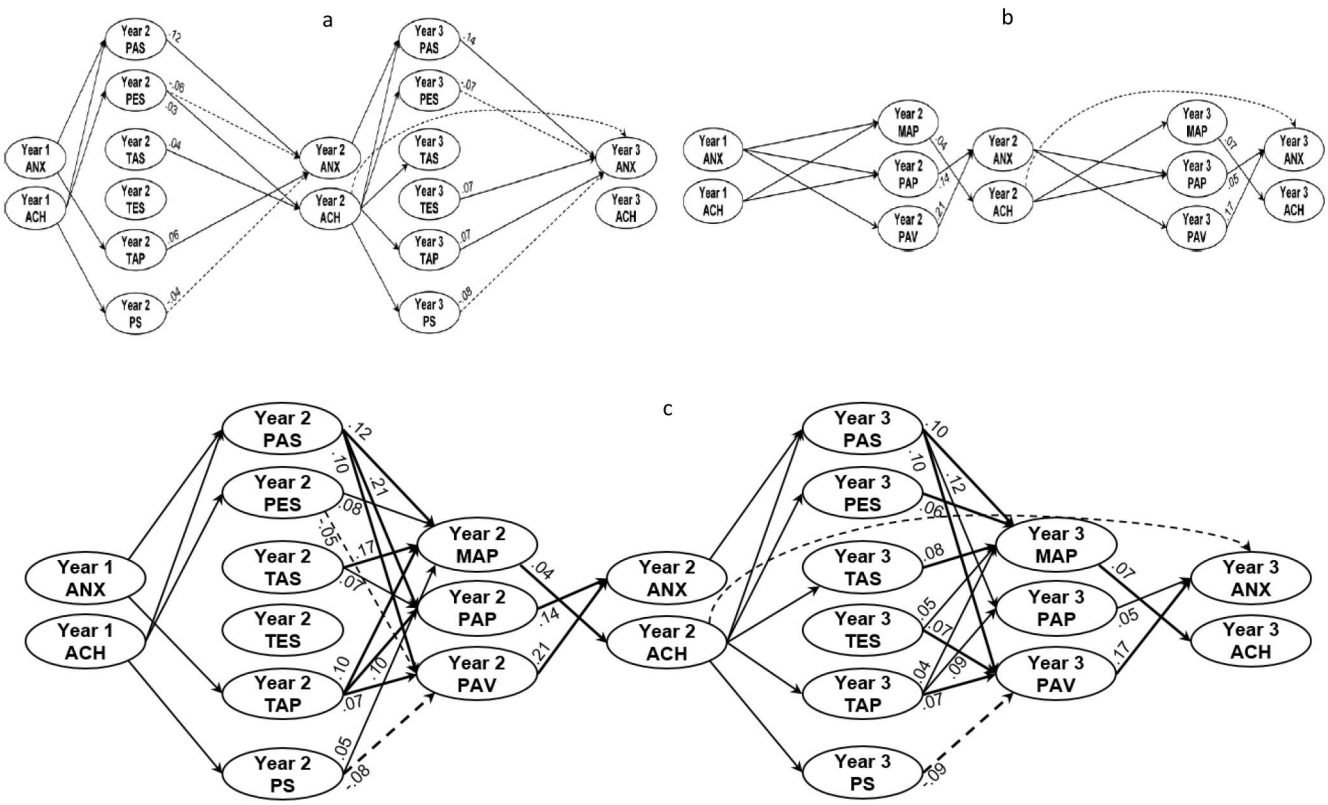

Figure 2. Partial representations of the significant paths from structural equation modeling. Only paths significant at $p < .01$ are presented. Stability paths and disturbance terms are not presented for clarity. Solid lines indicate positive paths; dotted lines indicate negative paths; thick lines indicate paths associated with significant mediation effects by achievement goals. (a) Direct paths from social support to test anxiety and academic achievement only; (b) direct paths from achievement goals to test anxiety and academic achievement only; (c) indirect paths from social support to test anxiety and academic achievement mediated by achievement goals. ANX = test anxiety; ACH = academic achievement; PAS = parental academic support; PES = parental emotional support; TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure; PS = peer support; MAP = mastery goals; PAP = performance-approach goals; PAV = performance-avoidance goals.

from parents continued to contribute significantly to all areas of academic motivation and achievement assessed in this study, despite the decline in the quantity of parental support perceived by the students. Moreover, perceived support from parents, especially parental academic support, was a stronger predictor of achievement goals and test anxiety than perceived support from teachers or peers.

Family is the basic social unit and a universal resource in the development of self and social relationships for adolescents across cultures. For adolescents in East Asian cultures, it takes on an even greater significance as a core element in their interdependent self-construal (U. Kim, Park, & Koo, 2004; Markus & Kitayama, 1991). In a country like Korea, the feelings, desires, and opinions of parents are closely monitored and respected by the child, which amplifies parental influence. Supporting this view, parental support has been a stronger predictor of various psychological constructs, such as achievement motivation, levels of aspiration and stress, life satisfaction, and self-efficacy for academic achievement and self-regulated learning, than teacher or peer support among Korean middle school students (U. Kim & Park, 1999). The importance of parental support, therefore, might have been greater in the present sample of Korean adolescents than in adolescent samples from Western countries.

One possible limitation of this study, which offers a direction for future research, has to do with the specificity associated with the assessment of the support variables. The KELS 2005 survey assessed all variables in reference to general school learning, except for the achievement test scores, which were collected from three specific subjects. This is recommended practice because it guarantees that the relationships between the variables would not be unduly over- or underestimated because of differences in measurement specificity (Pajares, 1996). Nevertheless, had the variables been assessed in reference to a particular subject area, perceived support from the teacher may have displayed a stronger predictive utility than parental support for student motivation and achievement in that subject. Peer influence also differs in its scope and strength, depending on the type of friendship in question (Berndt, 1992; Hartup & Stevens, 1997; Ryan et al., 1994). Students could perceive the support offered by close friends differently from that offered by peers in general, peers within a particular class, or mere

Table 6
Standardized Coefficients for the Paths From Social Support to Achievement Goals

Predictor	Mastery goal		Performance-approach goal		Performance-avoidance goal	
	Year 2	Year 3	Year 2	Year 3	Year 2	Year 3
PAS	.12**/.12**/.12**	.10**/.10**/.11**	.21**/.20**/.21**	.12**/.12**/.12**	.10**/.10**/.11**	.10**/.10**/.10**
PES	08**/.08**/.08**	06**/.05**/.06**	−.03/−.02/−.02	.01/.01/.01	−.05*/−.05*/−.06*	−.00/−.00/−.00
TAS	.17**/.18**/.16**	.08**/.09**/.08**	.07*/.07*/.06*	.01/.01/.01	**.04/−.02/.14****	−.01/−.01/−.01
TES	−.00/−.01/−.01	.05*/.05*/.05*	.01/.01/.01	.05/.05/.04	**.04/.09**/−.05**	07**/.07**/.07**
TAP	.10**/.10**/.10**	.04*/.04*/.04*	.10**/.09**/.10**	.09**/.09**/.08**	.07**/.07**/.08**	.07**/.08**/.07**
PS	05**/.05**/.05**	03/.03/.03	.02/.03/.03	−.02/−.02/−.02	−.08**/−.08**/−.08**	−.09**/−.10**/−.09**

Note. Coefficients from the whole sample are reported first, followed by those for boys, and then those for girls from the multi-group analysis. Coefficients in bold indicate significant gender differences at $p < .01$. PAS = parental academic support; PES = parental emotional support; TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure; PS = peer support.
* $p < .01$. ** $p < .001$.

acquaintances. We encourage researchers to investigate these issues in future studies.

Parental emotional support as an independent and adaptive form of social support. Perceived academic support and perceived emotional support have correlated strongly in past research, especially when they involved the same social agent. For this reason, they were sometimes treated as correlated dimensions of a single social support factor (Wentzel, 1997, 1998) or, at other times, as correlated yet independent factors (H. Patrick et al., 2007). Partly for this reason, the unique role played by each type of support has not been fully identified. Academic and emotional support again correlated strongly with each other in this study, whether they came from parents or teachers. Nonetheless, they clearly formed two independent factors, as defined by their respective items. Because academic and emotional support from parents and that from teachers were examined simultaneously in a single sample, the characteristics associated with each type of support and each type of social agent were unambiguously outlined in relation to student motivation and achievement.

Whereas academic support and emotional support, whether they came from parents or teachers, predicted different motivation and achievement outcomes, the divergence between the two types of support was more evident when the support came from parents. Perceived emotional support from parents was clearly beneficial to

Table 7
Standardized and Unstandardized Estimates and Confidence Intervals for Mediation Effects

Path						Indirect effect			
						β	*b*	(*SE*)	95% CI
PAS	→	PAP	→	ANX	Year 2	.03	0.04*	(0.01)	[0.03, 0.06]
					Year 3	.01	0.01	(0.00)	[0.00, 0.02]
PAS	→	PAV	→	ANX	Year 2	.02	0.03*	(0.01)	[0.01, 0.04]
					Year 3	.02	0.02*	(0.01)	[0.01, 0.03]
PES	→	PAV	→	ANX	Year 2	−.01	−0.01	(0.01)	[−0.02, −0.00]
TAS	→	PAP	→	ANX	Year 2	.01	0.01	(0.00)	[0.00, 0.02]
TES	→	PAV	→	ANX	Year 3	.01	0.01*	(0.01)	[0.01, 0.03]
TAP	→	PAP	→	ANX	Year 2	.01	0.01*	(0.00)	[0.01, 0.02]
					Year 3	.00	0.01	(0.00)	[0.00, 0.01]
TAP	→	PAV	→	ANX	Year 2	.02	0.02*	(0.00)	[0.01, 0.03]
					Year 3	.01	0.01*	(0.00)	[0.01, 0.02]
PPR	→	PAV	→	ANX	Year 2	−.02	−0.02*	(0.01)	[−0.04, −0.01]
					Year 3	−.02	−0.02*	(0.01)	[−0.03, −0.01]
PAS	→	MAP	→	ACH	Year 2	.01	0.45*	(0.18)	[0.18, 0.88]
					Year 3	.01	0.53*	(0.15)	[0.28, 0.89]
PES	→	MAP	→	ACH	Year 2	.00	0.22	(0.10)	[0.07, 0.47]
					Year 3	.00	0.24*	(0.10)	[0.08, 0.47]
TAS	→	MAP	→	ACH	Year 2	.01	0.52*	(0.17)	[0.22, 0.90]
					Year 3	.01	0.41*	(0.15)	[0.17, 0.76]
TES	→	MAP	→	ACH	Year 3	.00	0.30	(0.15)	[0.02, 0.63]
TAP	→	MAP	→	ACH	Year 2	.00	0.29*	(0.10)	[0.12, 0.54]
					Year 3	.00	0.20	(0.10)	[0.04, 0.43]
PPR	→	MAP	→	ACH	Year 2	.00	0.20	(0.10)	[0.04, 0.45]

Note. Bootstrap $J = 1{,}000$. CI = confidence interval; PAS = parental academic support; PES = parental emotional support; TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure; PS = peer support; MAP = mastery goal; PAP = performance-approach goal; PAV = performance-avoidance goal; ANX = test anxiety; ACH = academic achievement.
* $p < .01$.

adolescent motivation and achievement. Adolescents who believed that they received strong emotional support from their parents were more likely to pursue mastery goals, less likely to pursue performance-avoidance goals, felt lower test anxiety, and attained higher levels of academic achievement. These results are consistent with previous research that has found the emotional support from parents reduces test anxiety (Leung et al., 2010) and encourages a stronger orientation toward mastery goals in learning situations (Wentzel, 1998).

It is especially noteworthy that the negative path from parental emotional support to test anxiety, and the positive path to academic achievement via mastery goals, emerged in 2 consecutive school years, the sophomore and senior years at middle school. We controlled for a host of preceding variables when estimating the paths in the sophomore and senior years. Furthermore, academic achievement was extremely stable throughout the middle school years, with stability coefficients as high as .92. The consistent nature of these significant relationships involving parental emotional support suggests that they are all the more reliable.

Parental academic support as a double-edged sword. Perceived academic support from parents, on the other hand, did not demonstrate consistent relationships with the measured variables. It was linked to both adaptive and maladaptive indexes of student motivation across the two school years. As students recognized greater academic support from their parents, they were more likely to adopt not only mastery goals but also the two performance-oriented achievement goals. Increased parental academic support also made students more anxious about tests both directly and indirectly, the latter case by increasing the likelihood of students adopting performance-approach and performance-avoidance goals. It thus simultaneously played both a positive and a negative role in adolescent student motivation.

A close inspection of the items assessing perceived parental academic support revealed that some of the items could have been interpreted by students as pressure and control rather than a pure form of support. For example, items such as "(My parents) check my schoolwork and homework assignments," "(My parents) monitor my school grades," and "(My parents) supervise my daily life and oversee my schedule" could have been understood by students as a controlling parenting style or achievement pressure from parents. We recommend that parental achievement pressure be assessed along with parental academic and emotional support in future research, which will help tease out the occasionally subtle differences between support and pressure as subjectively experienced by adolescent learners.

Academic Support From Teachers as an Antonym of Achievement Pressure

The results from this study clearly established that emotional support is a desirable type of attention that parents could give to their child, as it is associated with only beneficial motivational and behavioral outcomes. Perceived emotional support from teachers, in comparison, was not as effective at enhancing positive motivation or guarding against detrimental academic tendencies, a finding consistent with H. Patrick et al. (2001). Rather, it was the perceived academic support from teachers that proved more helpful for adolescent students. It consistently predicted the adoption of mastery goals during the sophomore and senior years at middle school, which directly predicted academic achievement. Academic support from teachers also directly predicted academic achievement during the sophomore year.

The perceived academic support from teachers assessed in this study was indirect, defined as students' perceptions of teachers demonstrating expert knowledge in the subject area and enthusiasm for teaching. Even so, it still managed to demonstrate significant predictive utility for adaptive student outcomes in the midst of other support variables. This result is in line with B. C. Patrick et al. (2000), who found that college students demonstrated higher levels of intrinsic motivation and psychological vitality after observing enthusiastic teachers. Out of 13 teacher-related variables, teacher enthusiasm was the strongest predictor of students' intrinsic motivation and vitality. Its predictive power was stronger than more direct forms of teacher academic support such as promoting the relevance of learning materials, variation in the presentation method, and clarity of presentation.

Kunter et al. (2008) showed that enthusiasm for teaching was a significant predictor of the instructional behavior of teachers, including closely monitoring student behavior, challenging students cognitively, and providing social support for students. This trend was observed both when instructor behavior was self-reported and when it was rated by students. In summary, the available evidence, including the present results and those of H. Patrick et al. (2001), clearly indicates that enthusiastic teachers engage students in high-quality instructional processes, which positively supports their academic motivation and achievement.

In contrast to teachers' academic support, teachers' achievement pressure predicted not only the two types of approach-oriented achievement goal, but also performance-avoidance goals and the test anxiety of students. The predictive nature of teachers' achievement pressure was thus highly similar to that of parental academic support. The fact that adolescent students were more likely to adopt the three types of achievement goal, even though these goals are of a contrasting nature, suggests that students received mixed messages from teachers who demanded that they study hard and attain a higher level of academic success. Previous research has already discovered that a strong focus on evaluation in a learning environment increases the likelihood of students pursuing performance-focused achievement goals (Church et al., 2001). It is an irony that recognizing the pressure that their teachers exerted on them did not lead to students improving their academic success—the ultimate goal teacher pressure is intended to achieve. If anything, increases in achievement pressure resulted in higher levels of test anxiety among adolescent students, which is well known for its debilitating effects on academic performance.

Perceived Support From Peers as a Buffer Against Anxiety and Avoidance Goals

Intimacy is a representative feature of friendship during adolescence, especially for girls (Berndt, 1992). Positive relationships with peers form the foundation of a psychologically safe environment for adolescents, which supports their academic motivation and achievement (Wentzel, 2005). For this reason, adolescents with supportive peer relationships tend to demonstrate better adjustment and adaptive motivation in academic contexts. The present study was in agreement with these previous findings. Adolescent students who perceived stronger support from their peers

reported stronger mastery goals, weaker performance-avoidance goals, and lower test anxiety. The negative paths to performance-avoidance goals and test anxiety emerged consistently over two consecutive middle school years.

Of the many positive benefits that peer support offers, the most critical may be that it acts as a stress buffer (Cohen & Wills, 1985; Hartup & Stevens, 1997). Han, Park, and Lee (1997) demonstrated that although support from parents, teachers, and peers all negatively and indirectly predicted Korean adolescents' stress via increased feelings of self-worth, support from peers also directly predicted lower levels of stress. According to Wentzel (1999), children who receive support from friends regulate their emotions and adjust to school more effectively, which explains why positive peer relationships are directly related to academic motivation and performance at school. In this sense, the observation that perceived support from peers discourages students from pursuing performance-avoidance goals is of particular importance. It has been demonstrated on a number of occasions that performance-avoidance goals predict a range of maladaptive processes and outcomes, including self-handicapping, avoidance of help-seeking, a weaker sense of self-efficacy, and poorer achievement (Elliot & McGregor, 2001; Middleton & Midgley, 1997; Urdan, 2004), a pattern also observed in samples of Korean middle school students (Bong, 2009; Jiang et al., 2014). The less likely a student is to adopt performance-avoidance goals, the more likely they are to avoid these maladaptive motivational processes.

Peer support is generally characterized by its intimate characteristics (Berndt, 1982, 1992). We have acknowledged that the measure of peer support used in this study more closely represents emotional support than it does academic support. Unfortunately, the nature of the data set did not allow us to distinguish between the two types of peer support. Although it is unclear whether adolescent students distinguish between the academic and emotional support they receive from their friends and classmates as clearly as they would the support from their parents or teachers, it would be worthwhile to compare the relative benefits of each for student motivation and achievement in future studies.

Achievement Goals as Motivational Mediators of Perceived Social Support

Wentzel (1998, 1999) has suggested that social and academic motivational processes mediate the association between students' interpersonal relationships and academic achievement. This mediating role of motivation was supported in this study through an analysis of achievement goals. The relationships between social support and academic achievement were mediated by mastery goals, and those between social support and test anxiety by performance-approach and performance-avoidance goals. The same pattern was observed in both school years.

That the two types of performance goal mediated the relationships between perceived social support and test anxiety is hardly surprising. Both trait and state anxiety have been recognized as significant correlates of performance-avoidance and performance-approach goals (Bong, 2009; Elliot & McGregor, 1999, 2001). In fact, the significant pathways from test anxiety to the two performance goals, and from the two performance goals to test anxiety, were repeated over the course of the 3 middle school years examined in this study. In contrast to previous research (Harackiewicz et al., 2002; Senko, Hulleman, & Harackiewicz, 2011), performance-approach goals were never more strongly correlated with academic achievement than were mastery goals during these middle school years. As with the links between test anxiety and the two types of performance-oriented achievement goals, the significant academic achievement-mastery goal-academic achievement link emerged consistently during the three middle school years in this study.

At least two possible explanations for the failure of performance-approach goals to predict academic achievement are apparent. One is the consistently stronger correlation between mastery goals and academic achievement than that between performance-approach goals and academic achievement. When entered into the same regression equation with mastery goals, performance-approach goals were no longer significantly associated with achievement, despite the significant bivariate correlation. This proves that the correlation with academic achievement demonstrated by performance-approach goals was in fact the result of the variance it shared with mastery goals. The second possible explanation was offered by Brophy (2005). He contended that the way performance-approach goal items are written renders it impossible for low-performing students to agree with the content. For items that ask whether a student's goal is to outperform others, the student needs a background of high academic achievement in order to answer affirmatively. Because we controlled for student achievement scores in the previous school year, nullifying the effect achievement history played in student responses, what remained in the measure of performance-approach goals was a variance not attributable to previous achievement. Unlike mastery goals, this unique variance in the performance-approach goals did not contribute to achievement gains.

These explanations notwithstanding, the consistently stronger effect of mastery goals on academic achievement compared with that of performance-approach goals has been observed repeatedly among Korean students in past research. For example, Bong (2009) reported that mastery goals in mathematics demonstrated a stronger correlation with achievement indexes in the same subject for participants ranging from Grades 1 to 9 and for achievement indexes ranging from subjective ratings by teachers to scores on the mathematics final examination. The stronger connection of mastery goals was consistent for all age groups across all types of achievement index. In another study (Bong, 2005), mastery goals were again a stronger predictor of final examination scores in mathematics than were performance-approach goals among Korean high school girls. Neither study was able to establish whether this difference owes to Korean culture or the characteristics of mathematics as a subject. The present study demonstrated that the stronger effect of mastery goals on academic achievement is not restricted to mathematics. Whether it represents a cultural difference remains an important area of future research.

Gender Differences in the Temporal Stability of Perceived Social Support

Contrary to our expectations, few gender differences were observed in the relationships between perceived social support, student motivation, and achievement. Girls are generally believed to be more sensitive to social relationships and benefit more from social support when compared with boys, especially when suffer-

ing from emotional problems or stress (Helsen et al., 2000; Tamres et al., 2002). This assumption was not supported by our study. Girls and boys in early adolescence may be more or less equally affected by social support until they reach late adolescence, during which time the significance attached to social support as perceived by the two genders begins to change. Several studies involving young adolescents have in fact found no gender differences in the manner in which perceived social support affects academic motivation and achievement (Midgley et al., 1989; Wentzel, 1998).

Significant gender differences emerged, however, in the temporal stability of all types of social support from all three social agents. In addition, the test anxiety, academic achievement, performance-approach goals, and performance-avoidance goals of girls were significantly more stable than those of boys. Considering that the achievement scores for both genders were extremely stable throughout middle school, these results raise the possibility that the perception and motivation of girls depend more heavily on their test scores than do those of boys. This is a cause for concern because it would be more difficult for parents, teachers, and peers to improve the perceptions of girls regarding the quantity and quality of support they receive from these significant others than to improve the same perceptions of boys.

Sociocultural Factors Unique to Korea and Their Implications

Two factors unique to the Korean educational context that could have influenced the findings and hence deserve mention are collectivism and the heavy emphasis on scholastic achievement. Owing partly to the Confucian belief (and post-Korean War observation) that education is an effective tool for quickly attaining wealth and social status, Korean parents have come to value education in the hopes of seeing their children succeed in society (Bong et al., 2008), and the resulting strong focus on scholastic achievement is a source of parental academic support. Unfortunately, it is also a source of parental achievement pressure (Bong, 2003). When coupled with the characteristics of parent–child relationships within a collectivistic culture, the high value parents place on education often functions as an impetus for Korean adolescents to achieve academically. In other words, they strive to recompense their parents for their support and sacrifice with strong academic performance.

The positive relationship observed in this study demonstrated by parental academic support with the performance-oriented achievement goals and test anxiety of Korean students may therefore be explained by these factors. We caution, however, that it is important to recognize the underlying psychological mechanisms that explain these findings rather than merely viewing them as specific to Korea and hence lacking generalizability. It is possible that academic support from parents and teachers, when accompanied by achievement pressure or offered in a highly performance-oriented achievement context, will produce the same results in different cultures.

Conclusion

The constraint of having to rely on an existing longitudinal database precluded the possibility of fine-tuning the measurement and assessment of the variables to suit the objectives of the study and prevented the ability to draw strict parallels between the three social agents. In addition, some of the relationships examined in the present study, particularly those associated with parents, were believed to be stronger in this sample of Korean adolescents than they would be in Western samples, owing to sociocultural factors specific to the Korean context. Despite these constraints, the support–motivation–outcome link observed in previous research was replicated in this study. This attests to the generalizability of extant theory and research on social support for adolescents in different cultures and the robustness of the findings reported in this study.

We were able to present convincing evidence that the form in which social support is delivered has an effect on adolescent motivation and achievement. The present results are particularly informative and reliable because significant paths consistent with both theory and prior research were obtained after controlling for achievement, test anxiety, and the same variables assessed in the preceding year. Changes in perceived social support from the previous year, however slight they may have been, significantly predicted changes in achievement goals, and these, in turn, significantly predicted changes in test anxiety and academic achievement. Moreover, this predictive pattern was consistent for both the sophomore and senior years at middle school.

Based on these findings, we offer several implications for parents and educators. Even though the influence of adults on children declines during adolescence, parents still appear to maintain the greatest influence on adolescent academic motivation and achievement. The present results suggest that emotional support from parents and peers can create a psychologically safe learning environment for adolescents, in which they experience stronger mastery goals, weaker performance-avoidance goals, lower test anxiety, and higher academic achievement. Classroom research conducted in Korea and the United States has already demonstrated that teaching styles that provide autonomy support are a positive predictor of classroom engagement and achievement in adolescent learners (Jang, Kim, & Reeve, 2012; Jang, Reeve, & Deci, 2010). Students perceive autonomy support in the classroom when they "feel understood" by the teacher and the teacher "conveys confidence" in and "encourages, listens, and understands" them (Jang et al., 2012)—in other words, when the teacher provides emotional support.

Parents need to exercise due caution when they offer academic support to their children. As the present results indicate, adolescent learners could perceive parental academic support as achievement pressure in disguise. Although this is a potential problem for all sources of academic support with regard to the learning environment, academic support from social figures other than parents appears to have a much lower risk of being perceived as academic pressure. Emotional support, regardless of the provider, seems to be free from this risk altogether. We thus recommend that parents be careful in their selection of language and behavior when they try to offer academic support to their children.

Although not the main focus of this research, the mediating patterns demonstrated by achievement goals observed in this study also helped clarify the exact nature of each achievement goal, which remains a topic of debate in the literature. Mastery goals were clearly more positive for learning than performance-approach goals for the sample of Korean middle school students in this study. Given the consistent and significant paths linking test anx-

iety to performance-approach goals, and vice versa, researchers should exercise due caution when interpreting performance goal effects. Finally, future research should seek to determine whether the relationships that academic and emotional support maintain with student motivation and achievement remain stable as students grow older and the learning environment becomes more challenging.

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Appendix A

Factor Loadings of the Perceived Parental Support Items

Variable	Factor		Item
	PAS	PES	
How much are your parents doing the following things for you?			
PAS1	**.49/.50**	.25/.24	Create a study-friendly environment at home.
PAS2	**.78/.77**	−.13/−.13	Check my schoolwork and homework assignments.
PAS3	**.65/.63**	−.19/−.16	Personally teach me.
PAS4	**.59/.60**	.12/.14	Give advices on how to study.
PAS5	**.49/.55**	.10/.06	Monitor my school grades.
PAS6	**.58/.61**	.03/.05	Collect information on private tutoring services and after-school academies.
PAS7	**.34/.34**	.26/**.32**	Spend generously on expenses related to my study (after-school academies, private tutoring services, study materials, etc.).
PAS8	**.60/.68**	.12/.04	Supervise my daily life and oversee my schedule.
PES1	−.10/−.10	**.97/.99**	Encourage me.
PES2	.00/−.02	**.69/.72**	Care about my feelings.

Note. Results are from exploratory factor analysis with promax rotation. Factor loadings from Year 2 are presented to the left of the slash; those from Year 3 to the right. Values greater than .30 are in bold. PAS = parental academic support; PES = parental emotional support.

(*Appendices follow*)

Appendix B

Factor Loadings of the Perceived Teacher Support and Achievement Pressure Items

Variable	Factor			Item
	TAS	TES	TAP	
TAS1	**.73/.78**	.11/.06	.00/−.02	My teacher teaches enthusiastically.
TAS2	**.81/.80**	.05/.06	−.04/−.04	My teacher possesses qualities that deserve respect.
TAS3	**.90/.86**	−.10/−.05	.01/.01	My teacher is highly knowledgeable about the subject matter s/he teaches.
TAS4	**.75/.72**	.02/.07	.01/−.01	My teacher loves teaching.
TES1	−.06/.01	**.65/.67**	−.03/−.03	My teacher understands students from students' point of view.
TES2	.00/−.01	**.60/.67**	−.03/−.02	My teacher never ignores students' opinions.
TES3	.00/−.01	**.74/.78**	−.03/−.06	My teacher treats students with fairness.
TES4	−.02/−.02	**.83/.81**	.01/.02	My teacher understands the hard issues that I'm struggling with.
TES5	.07/.05	**.68/.70**	.03/.04	My teacher gives students frequent complements.
TES6	.06/.07	**.70/.70**	.04/.04	My teacher helps me when I'm faced with a difficult issue.
TAP1	.22/**.53**	.03/−.04	.25/.10	My teacher wants students to study hard.
TAP2	−.01/.12	−.13/−.13	**.55/.50**	My teacher does not like it when students are not studying hard.
TAP3	−.06/−.05	.00/−.03	**.68/.63**	My teacher emphasizes that our class should rank high on regular examinations.
TAP4	−.01/−.04	.00/.02	**.83/.86**	My teacher demands that every student must complete her/his homework assignments.
TAP5	.07/.06	.10/.13	**.53/.53**	My teacher meticulously checks students' homework assignments.

Note. Results are from exploratory factor analysis with promax rotation. Factor loadings from Year 2 are presented to the left of the slash; those from Year 3 to the right. Values greater than > .30 are in bold. TAS = teacher academic support; TES = teacher emotional support; TAP = teacher achievement pressure.

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