

The Role of Goal Structures and Peer Climate in Trajectories of Social Achievement Goals  
during High School

Kara A. Makara<sup>1</sup> and Nir Madjar<sup>2</sup>

<sup>1</sup> University of Glasgow

<sup>2</sup> Bar-Ilan University

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## Abstract

Students' social goals—reasons for engaging in interpersonal relationships with peers—are consequential for students' interactions with their peers at school and well-being. Despite their importance at school and the salience of peer relationships during adolescence, research on social goals is generally lacking compared to academic goals and it is unknown how these social goals develop over time, especially among high school students. The aim of the study was to assess trajectories of high school students' social goals across two years as well as to determine how relevant individual and contextual variables predicted initial levels and trajectories of students' social goals. Participants were 9<sup>th</sup>-12<sup>th</sup> grade students ( $N = 526$ ) attending a US high school. Students filled out surveys of their social goals (social development, social demonstration-approach, and social demonstration-avoidance) six times across two school years. Non-linear growth curve analyses and piece-wise growth curve analyses were used to assess trajectories of social goals across time. Students' initial levels of social goals differed during high school based on their gender, grade level, prior achievement, and perceptions of classroom goals structures and peer climate. Furthermore, despite substantial stability over time, the shapes of these goal trajectories were predicted by students' gender, grade level, and perceptions of classroom goal structures and peer climate. In particular, students who perceived an increase in performance-avoidance classroom goals maintained higher demonstration social goals and decreased in developmental social goals over time, and students who perceived an increase in positive peer climate decreased in demonstration-avoidance social goals. Implications and directions for future research on social goals are discussed.

*Keywords:* social achievement goals, classroom goal structures, high school, social development, growth curve analysis

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Students' reasons for interacting with their peers are consequential for their well-being and adjustment at school. Social goals—purposes for engaging in interpersonal relationships with others—stem from universal needs for belongingness and status, which are especially salient during adolescence (e.g., Berndt, 1979). Having adaptive social motivation is an important student outcome in its own right as an aspect of healthy social development. Furthermore, because social goals are associated with how students interact with their peers at school (Horst, Finney, & Barron, 2007; Mouratidis & Sideridis, 2009; Rodkin, Ryan, Jamison, & Wilson, 2012; Ryan & Shim, 2006; 2008) and with their academic help seeking (Roussel, Elliot, & Feltman, 2011; Ryan, Hicks, & Midgley, 1997), they have implications for students' academic success as well. Despite growing evidence of their importance, it is unknown how social goals change across time. Understanding the development of social goals and identifying which factors influence that change has educational implications regarding how educators can intervene in schools to positively facilitate students' social development and academic success. The current study contributes to the extant literature by examining changes in high school students' social goals from the beginning, middle, and end of the year across two school years as well as how important contextual and individual factors predict differences in the shape of these trajectories.

We draw from the Achievement Goal Theory perspective for framing social goals, which defines motivation as the goals students pursue when engaging in achievement-related contexts (e.g., Dweck, 1986; Elliot, 2005). An extensive amount of research within the Achievement Goal perspective has examined students' goals within the academic domain. However, students at school have goals not only for their academics but also for their social relationships with their

peers (Anderman & Anderman, 1999; Covington, 2000; King, McInerney, & Watkins, 2010; Ryan & Shim, 2006). Social goals are highly relevant to students; students often place just as much (or even more) emphasis on social goals as they do on academic goals in the classroom setting (Covington, 2000; Dowson & McInerney, 2003; Horst et al., 2007; Ryan & Shim, 2006). From a multiple goal perspective, students who have adaptive social goals in addition to academic goals in school are most successful (Wentzel, 1996). Below we review literature on social achievement goals and then summarize major contextual and personal factors that are likely to be associated with the development of social goals at school.

### *Social Achievement Goals*

The Achievement Goal perspective posits that students' active engagement in a variety of domains (e.g., academic, social, athletic) is driven by a pursuit of feeling competent. Students are oriented toward developing competence or demonstrating competence (e.g., Dweck & Leggett, 1988; Elliot & McGregor, 2001; Elliot, 2005), and these goal orientations have implications for students' achievement-related cognitions, emotions, and behaviors (e.g., Barron & Harackiewicz, 2001; Daniels et al., 2009; Elliot & Dweck, 1988; Midgley, Kaplan, & Middleton, 2001; Wolters, 2004). Researchers who study academic achievement goals in classrooms have found that goals related to the social context are also salient to students when they are at school (e.g., Blumenfeld, 1992). These researchers theorize that students may have similar goals in the social realm as they do in the academic realm, which has led to multiple conceptualizations of social goals across the past several decades.

This study draws from a conceptualization of social goals modeled on the Achievement Goal perspective. Alternatively, social goals have been conceptualized as social purposes for academic achievement (Urdu & Maehr, 1995), as goal content, for example, students' goals to

be prosocial or socially responsible (Wentzel, 1994), or on an approach-avoidance dimension (Elliot, Gable, & Mapes, 2006). In the vein of the 3-dimensional framework commonly used in the Achievement Goal perspective, Ryan and Shim (2006, 2008) created and validated scales to assess students' social achievement goals. *Development* goals refer to a focus on developing and sustaining high quality friendships and improving social competence, *demonstration-approach* goals refer to demonstrating friendships by striving to appear popular and comparing social competence to others, and *demonstration-avoidance* goals refer to avoiding looking like one does not have friendships by avoiding being made fun of or appearing unpopular. The terms of *development* and *demonstration* used by Ryan and Shim (2006, 2008) to label social goals are parallel to *mastery* and *performance*, respectively, which are the widely used labels for achievement goals within the academic domain. These social achievement goals (e.g., orientations toward developing or demonstrating interpersonal relationships) are considered broader than content-based social goals (e.g., a goal to be prosocial, or a goal to be dominant), because goal orientations transcend goal content (Ryan & Shim, 2006). This study focuses on changes in social achievement goals, given that social goal content can fluctuate from situation to situation (e.g., Ojanen, Aunola, & Salmivalli, 2007) and we are interested instead in the broader development of students' overall approaches to their peer relationships at school.

Research on social goals within the Achievement Goal perspective has largely focused on the association of students' social goals with various interpersonal behaviors, cognitions, emotions, and academic goals. Social development goals are highly adaptive—they are positively associated with positive social relations, self-acceptance, and personal growth (Ryan & Shim, 2006), social competence (Shim & Ryan, 2012), prosocial behavior and quality of best friends (Ryan & Shim, 2008), feelings of belongingness and negatively with loneliness (Mouratidis &

Sideridis, 2009), academic engagement and social satisfaction (Shim, Cho, & Wang, 2013), positive relations with others and academic mastery goals (Horst, Finney, & Barron, 2007), and they alleviate the relationship between interpersonal stress and depression (Kuroda & Sakurai, 2011). Demonstration-oriented social goals are generally less adaptive. Social demonstration-approach goals are negatively associated with personal growth and autonomy, and positively with social worry (Ryan & Shim, 2006), negatively related to prosocial behavior and positively related to aggressive behavior and perceived popularity (Ryan & Shim, 2008; Shin & Ryan, 2012), positively related with academic performance-approach and performance-avoidance goals and with fear of negative evaluation and negatively related with positive relations with others (Horst et al., 2007), predict disruptive behaviors and social worry (Shim et al., 2013), and negatively predict peer acceptance (Mouratidis & Sideridis, 2009). Social demonstration-avoidance goals are positively associated with academic performance-approach goals, academic performance-avoidance goals, and fear of negative evaluation, and negatively related to positive relations with others (Horst et al., 2007), positively associated with social worry (Ryan & Shim, 2006; Shim et al., 2013), negatively related to aggressive behavior and perceived popularity and positively related to anxious solitary behavior and social worry (Ryan & Shim, 2008), are negatively associated with social competence, popularity, and prosocial behavior and positively associated with anxiety and internalizing behavior (Shim & Ryan, 2012), and positively predict loneliness (Mouratidis & Sideridis, 2009).

#### *Change in social goals across time*

It is unclear how social goals develop within and across school years because longitudinal research on social goals is scarce. Based on a two time-point design during the transition from elementary to middle school, a recent study determined that young adolescents'

social dominance goals and popularity goals (similar to demonstration goals) increased whereas intimacy goals (similar to a development goal) did not (Kiefer, Matthews, Montesino, Arango, & Preece, 2013). Research on changes in academic achievement goals over time is much more plentiful. Academic goals are relatively stable within the same school year (Fryer & Elliot, 2007) or moderately decrease (Tuominen-Soini, Salmela-Aro, & Miemivirta, 2011), although they vary between different domains and tasks (Muis & Edwards, 2009). A moderate decrease in all three types of academic goals (mastery, performance-approach, and performance-avoidance) was also found between school years, especially during school transitions (Middleton, Kaplan, & Midgley, 2004; Tuominen-Soini et al., 2011). Regarding our hypotheses for how social goals will change in this study, to some extent we expect decreases in goals within each school year given the general trend of academic motivation decreasing each school year, although it is unclear how they will change more broadly across two school years. In this study, we examine between-subjects differences and within-subject changes across two school years. Social goals are assessed three times each year to measure change both within and across school years, and because three or more time points are needed to document longitudinal trends (Raudenbush & Bryk, 2002; Rogosa, 1988). Assessing change in social goals is not only important for determining the development of high school students' social goals, but also for identifying personal and contextual factors that explain this change over time, giving more support than cross-sectional studies for determining the variables that matter for social goal development.

#### *Social goals and the school context*

It is important for educators and researchers to understand how malleable aspects of the school environment may lead to the adoption of social goals and changes in their trajectories. Students' social goals may be associated with the academic climate of the school through

classroom achievement goals, or *goal structures*, that reflect the salience of mastery and performance academic goals promoted by the instructional procedures within the classroom (Ames, 1992; Ames & Archer, 1988; Kaplan, Middleton, Urdan, & Midgley, 2002). In a mastery goal structure, the teacher communicates the purpose of engaging in academic work as developing competence, and thus emphasizes learning, trying hard, and deep understanding of the material. In classrooms that emphasize performance-approach goal structures, the teachers may post grades, display only the best work on the walls, emphasize competition among students, and emphasize the importance of grades. Finally, in classrooms that emphasize performance-avoidance goals, the teacher communicates that the purpose of engaging in academic work in the classroom is to avoid demonstrating incompetence and to not make mistakes in front of other students (Midgley et al., 2000). There is support that high school students differentiate between performance-approach and performance-avoidance goal structures (Schwinger & Stiensmeier-Pelster, 2011) and that each of the three academic classroom goals uniquely predicts academic behaviors among college students (e.g., Karabenick, 2004).

Research on social goals suggests that adaptive academic classroom goal structures (mastery) should lead to the adoption of development social goals, and similarly, maladaptive academic classroom goal structures (performance-approach and –avoidance) should lead to the adoption of demonstration social goals. The association between academic goal structures and students' social goals has not been empirically explored among high school students (grades 9-12), although it has been examined in younger grades. Shim, Cho, and Wang's (2013) study of middle school students found that students' perceived academic mastery goal structure positively predicted students' social development goals and negatively predicted students' social demonstration-approach and demonstration-avoidance goals. In the opposite manner, students'



perception of an academic performance goal structure positively predicted students' social demonstration-approach and demonstration-avoidance goals and negatively predicted their social development goals. In a study on social goal content among 5<sup>th</sup> and 6<sup>th</sup> graders, Kiefer et al. (2013) found that students' reports of teacher academic performance goals positively predicted popularity goals (somewhat similar to social demonstration-approach goals), and teacher promotion of social interaction and mutual respect positively predicted students' intimacy goals (somewhat similar to social development goals).

Although the studies just summarized provide an important infrastructure demonstrating the associations between classroom academic goal structures with students' personal social goals, the next necessary step is to understand whether and how these goal structures predict changes in trajectories of social goals across time. In order to address this, the current study will examine how perceptions of the school context at one time point as well as how changes in students' perceptions of the school context across time predict trajectories of students' social achievement goals. A few studies have examined how changes in the school context predict changes in students' academic behaviors and cognitions, although they do not examine social goals as an outcome. For example, studies focusing on the transition from elementary to middle school (e.g., Urdan & Midgley, 2003) and the transition from middle to high school (e.g., Anderman & Midgley, 2004) found that changes in students' perceptions of classroom goals from before to after the transition predicted students' academic behaviors, motivation, and performance. More specifically, Urdan and Midgley (2003) found that increases in middle school students' perceived mastery goal structure and decreases in perceived performance goal structure were generally adaptive for students' academic goals, emotions, and achievement at school, whereas perceived increases in performance goal structures were maladaptive.

This study includes measures of three classroom goal structures—mastery, performance-approach, and performance-avoidance. Although our measure generalizes across all classes at high school, it is possible that students may take a particular combination of classes that emphasize one type of academic goal structure more than other students taking a different combination of classes, and thus they are exposed to different classroom goals on average at school, which should lead to different reports in their overall perceived classroom goal structures at school. It is expected that students' perceptions of academic mastery goal structures across classes will be positively associated with social development goals and negatively with social demonstration-approach and demonstration-avoidance goals, with opposite patterns for performance goal structures. Furthermore, using growth trajectory models, it is expected that perceptions of each type of academic goal structure will predict increases in the related social goal over time (e.g., perceiving a performance-avoidance goal structure should lead to increases in social demonstration-avoidance goals over time). Using a measure of change in perceived classroom goal structure across school years, we predict that perceptions of an increase in classroom academic mastery goals will predict an increase in social development goals and decrease in demonstration-approach and –avoidance social goals, while perceived increases in classroom performance-approach and –avoidance goals will predict the inverse.

Peer relationships should also influence students' social goals because perceptions of the peer climate may lead to the adoption of particular motivational approaches toward interacting with those peers. Researchers typically examine how social goals predict various social outcomes, but in a reciprocal fashion, the social context at school could in turn impact students' espousal of particular social goals. Several studies have found that a positive social context at school is associated with more adaptive social goals, although these were conducted across a

range of developmental stages different from the age of the current study's student population. Horst et al. (2007) found that college students' self-reported positive relationships with others were positively associated with their social development goals and negatively associated with their demonstration-approach and demonstration-avoidance goals. Kiefer et al. (2013) found that students' self-reported peer support positively predicted popularity goals and intimacy goals (which may be similar to social demonstration-approach and development goals) in 5<sup>th</sup> graders and positively predicted only intimacy goals in 6<sup>th</sup> graders. Also focusing on goal content, Wentzel, Battle, Russell, and Looney (2010) found that several kinds of peer support and teacher support at school predicted 7<sup>th</sup> and 8<sup>th</sup> grade students' goals to be prosocial and compliant.

Our study includes a measure of students' perceptions of positive peer climate at school. Having a supportive group of peers at school may allow students to feel safe, leading them to focus on improving their relationships. Other students at school, however, may have a more maladaptive peer group and they may perceive a less positive peer climate at school. Therefore, in line with studies reporting positive correlations between social goals and peer climate/positive relations with others at one point in time (e.g., Horst et al., 2007; Mouratidis & Sideridis, 2009), it is expected that a positive peer climate will also predict a positive trajectory in social development goals across time. Perceptions that students at school are mean toward one another, through such behaviors as bullying or excluding one another, may lead students to become socially anxious and to be more concerned with demonstrating their social competence or trying to avoid demonstrating incompetence (e.g., Elliot et al., 2006). Therefore, it is expected that a positive peer climate will predict decreases in demonstration-avoidance goals over time. Using a measure of change in perceived peer climate across school years, we predict that increases in perceptions of positive peer climate will also predict an increase in social development goals and

a decrease in demonstration-avoidance goals. The relationship between perceived peer climate and students' demonstration-approach goals is exploratory.

*Social goals and individual differences*

Personal factors such as gender, grade level, and academic achievement may also be associated with social goals. Research has clearly shown that there are gender differences in approaches to social relationships. Female students tend to more highly endorse intimacy and social responsibility goals as compared to male students, and male students tend to strive for agentic social goals, competition, dominance and popularity goals more than female students (Anderman & Anderman, 1999; Kiefer & Ryan, 2008; Mathur & Berndt, 2006; Ojanen et al., 2007; Patrick, Hicks, & Ryan, 1997; Wentzel, 1993). Males have also reported higher academic performance goal orientations than females (e.g., Friedel, Cortina, Turner, & Midgley, 2007). Therefore, it is expected that female students will report higher initial levels of and greater increases over time in social development goals and male students will report higher initial levels of and increases over time in demonstration-approach goals, and males will either be no different from or higher than females in their reported social demonstration-avoidance goals.

Students' grade level may also predict different levels of and changes over time in social goals. Of the very few studies on high school students' social goals, Guan, Xiang, McBride, and Keating (2013) looked specifically at 9<sup>th</sup>-12<sup>th</sup> grade students' social content goals related to athletics, but they did not report grade-level differences. There is a general dearth of developmental research on social achievement goals, not only longitudinally but also cross-sectionally between grade levels. Specifically, we are interested in examining differences between our three cohorts of students: youngest (9<sup>th</sup> becoming 10<sup>th</sup> graders), middle (10<sup>th</sup> becoming 11<sup>th</sup> graders), and oldest (11<sup>th</sup> becoming 12<sup>th</sup> graders). We expect more variation in

social goals for younger students in the transition into high school compared to those who are already more established into the norms of the educational context (e.g., Archambault, Eccles, & Vida, 2010). Similarly, we also expect that the youngest students' social goals should be more strongly associated with the peer and teacher climate of the school compared to the older cohorts, especially if their goals are changing more in general.

Finally, students' prior academic achievement may also be associated with social goals. Social goals are positively correlated with their corresponding academic goals among college students (e.g., Horst et al., 2007), so correspondence with academic achievement is possible. Furthermore, Wentzel (1993) found a positive relationship between social responsibility content goals and student grades among middle school students. Therefore, if academic achievement predicts social achievement goals, it is expected that academic achievement will be positively related to social development because students who are doing better at school academically may in turn feel more belongingness at school and have more positive prosocial interactions with their peers. Alternatively, however, some students who are unwillingly high achievers may try to sustain their social status by downplaying their academic achievement and striving to demonstrate popularity or avoid appearing unpopular. Students with low academic achievement may seek to build their self-worth in the social domain rather than the academic domain and thus become more concerned with demonstrating their popularity, and thus low academic achievement may predict higher demonstration-approach and -avoidance social goals.

#### *Current study*

The aim of the current study is to advance understanding of the changes in social goals during high school. As called for almost two decades ago by Urdan and Maehr (1995), there is a need for studies on developmental changes in social goals, how socialization processes in

schools impact students' social goal orientations, and for research examining individual differences in social goals. Our sample comes from a large Midwestern U.S. high school. This age group is critical for understanding the development of social goals given contextual and development changes during adolescence. Similar to changes that occur during the transition from elementary to middle school (e.g., Midgley, Anderman, & Hicks, 1995; Wang & Holcombe, 2010), the transition from middle to high school brings substantial school context changes such as multiple teachers throughout the day (typically more so than in middle school), exposure to a greater number of peers, and a less intimate environment (Booth & Gerard, 2012; Eccles & Roeser, 2011; Ganeson & Ehrich, 2009). Furthermore, developmental changes in interpersonal relationships arise during late adolescence, for example, by ages 16-18, students report that friend support exceeds both teacher and parent support (Bokhorst, Sumter, & Westenberg, 2010). The data for this study contains measures of social goals spanning six waves across two school years. Through use of growth-curve analysis and piece-wise growth curve modeling, we focus on understanding: 1) how social goals change, linearly or non-linearly, across the two schools years; 2) how initial levels and trajectories of social goals are related to students' gender, grade level, and achievement; and 3) how initial levels and trajectories of social goals are related to students' perceptions of the peer climate and classroom academic goal structures at school.

The study aims to contribute to the existing literature in several ways. Assessing how social goals develop over time builds upon past research studies that have examined social goals at one or two time-points (e.g., Kiefer et al., 2013). We use a six-wave design that captures change both within the school year as well as across school years. Secondly, this study uses growth curve modeling to examine linear and non-linear trajectories across time, and this procedure is also less affected by random missing values compared to traditional longitudinal

analysis methods (e.g., repeated measures ANOVA; see Raudenbush & Bryk, 2002).

Additionally, previous literature in the academic Achievement Goal perspective suggests that the slopes of achievement goals should also be tested within each school year because goals may appear stable between grade levels whereas actually fluctuating within each year (e.g., Chouinard & Roy, 2008). Therefore we utilize piecewise growth curve analysis, a modeling technique that allows us to test the changes and predictors of social goal trajectories within each school year, specifically with regard to the role of changes in perceived academic and social context. We adopt a dynamic perspective by recognizing that both social goals and features of the educational system change over time and thus examine how these variables develop together when controlling for several individual differences. Thirdly, our focus on the high school population (ages 14-18) in the core stage of middle and late adolescence is a critical developmental level for research on social goals. The majority of past research on social goals has focused largely on elementary and middle school students (e.g., Anderman, 1999; Kiefer et al., 2013; Mouratidis & Sideridis, 2009; Rodkin et al., 2012; Ryan et al., 1997; Ryan & Shim, 2008; Shim et al., 2013; Wentzel et al., 2010; Wentzel, Baker, & Russell, 2012) and to a lesser extent on college students (Gable, 2006; Horst et al., 2007; Ryan & Shim, 2006; Shim & Ryan, 2012). The few studies on high school-aged students' social goals (e.g., Jarvinen & Nicholls, 1996; Roussel et al., 2011) did not use the development vs. demonstration social achievement goal conceptualization. In summary, the study contributes to a better empirical understanding of how individual differences and perceptions of the school context are associated with both the initial levels of social goals and change in social goal trajectories across time.

## **Methods**

### *Participants*

The study is part of a larger research project with 740 students, ages 14-18, from a public high school in the Midwestern region of the United States. The students attended the school in both the 2010-2011 and 2011-2012 school years, in three cohorts—9<sup>th</sup> graders who became 10<sup>th</sup> graders ( $n = 230$ ), 10<sup>th</sup> graders who became 11<sup>th</sup> graders ( $n = 233$ ), and 11<sup>th</sup> graders who became 12<sup>th</sup> graders ( $n = 277$ ). In other words, in the first year students were in 9<sup>th</sup>-11<sup>th</sup> grade and in the second year these same students were in 10<sup>th</sup>-12<sup>th</sup> grade. Fifty-four percent of the sample was female, and students self-identified as 62.9% White, 12.3% Black, 11.4% Asian, and 10.6% multi-racial or other. Comparing the sample to records of the entire school, our sample was slightly biased in having more European Americans and less African American students. According to 2011 records, 80% of the school population scored at or above proficient in reading and 77% scored at or above proficient in mathematics on a state standards-based achievement test, and 19.7% of the school was eligible for free or reduced price lunch.

Data was collected across six waves; however, only participants who were present at the two waves when classroom goal structures and peer climate were assessed could be included in the final analyses. Therefore, the final sample for this study consisted of 526 participants with a 26.9% attrition rate across all waves. Logistic regression indicated that the variables of interest—gender, academic achievement, social goals, perceived goal structures and perceive peer climate—do not significantly predict attrition. The only significant predictor was grade level, indicating that the attrition rate was lower among 11<sup>th</sup> grade students (22.0%, final  $n = 216$ ), compared to 9<sup>th</sup> grade (30.0%, final  $n = 161$ ) and 10<sup>th</sup> grade students (36.1%, final  $n = 149$ ). Therefore, missing data due to attrition is largely unrelated to the variables of interest within the study.

### *Procedure*



Hardcopy surveys were administered by teachers who read scripted instructions to students during homeroom periods across six waves: at the beginning (W1), middle (W2), and end (W3) of Year 1 (Y1), and the beginning (W4), middle (W5), and end (W6) of Year 2 (Y2). Students were told that their participation was voluntary and that their responses would be confidential. Students were given the entire period (35 minutes) to complete the surveys and placed finished surveys in an envelope provided for each classroom, reinforcing the confidentiality of their responses. Student ID numbers were used to link surveys over time.

### *Measures*

*Social Achievement Goals.* Social motivation was measured at every survey wave with the 13-item Social Achievement Goal Orientation Scale (SAGOS; Ryan & Hopkins, 2003, as cited in Horst et al., 2007)<sup>1</sup>. The scale is a reduced version of the original 22-item SAGOS and measures social development, demonstration-approach, and demonstration-avoidance goals. The scale has been validated among middle school and college students (Horst et al.). The phrase “at this school” was added to each item to specify the context. Students were given the following instructions: “Please indicate the extent to which the following statements describe you.” Five items were used to assess social development ( $\alpha$ 's W1 to W6 = .87, .87, .90, .91, .90, .88), e.g., “It’s important to me to have friends at this school who really understand me.” Four items were used to assess social demonstration-approach ( $\alpha$ 's W1 to W6 = .83, .87, .86, .86, .86, .87), e.g., “It’s important to me to be seen as having a lot of friends at this school.” Finally, four items were used to assess social demonstration-avoidance ( $\alpha$ 's W1 to W6 = .74, .79, .81, .81, .83, .84), e.g., “I’m often concerned that others at this school won’t like me.” Students responded to all items on a 5-point scale from 1 = “not at all true of me” to 5 = “very true of me.”

*Classroom Goals.* Students' perceptions of their school's academic goal structures were assessed in the middle of each school year (at the 2<sup>nd</sup> and 5<sup>th</sup> waves) from scales adapted from PALS (Midgley et al., 2000). The measure was adapted to be generalized across classes because students change classes throughout the day and all other measures were assessed at the school level. Students were given the following introduction: "My teachers at [name of school]..." followed by a series of items assessing classroom goal structures. Five items were used to assess mastery goal structure ( $\alpha$ 's at W2 and W5 = .74 and .75), e.g., "Recognize us for trying hard." Three items were used to assess performance-approach goal structure ( $\alpha$ 's at W2 and W5 = .67 and .67), e.g., "Tell us how we compare to different students." Three items were used to assess performance-avoidance goal structure ( $\alpha$ 's at W2 and W5 = .81 and .78), e.g., "Tell us that it is important that we don't look stupid in class." Students responded to items on a 4-point scale from 1 = "strongly disagree" to 4 = "strongly agree."

*Perceptions of Peer Climate.* Peer climate was measured in the middle of each school year (at the 2<sup>nd</sup> and 5<sup>th</sup> waves) with seven items assessing positive and negative peer interaction. This was an adapted shortened version from Brand, Felner, Shim, Seitsinger, and Dumas' (2003) assessment of school climate. Four items were worded positively, e.g., "Students enjoy doing things with each other in school activities." Three items were worded negatively, e.g., "Students in this school are mean to each other." Students responded to all items on a 4-point scale from 1 = "strongly disagree" to 4 = "strongly agree." The negative items were reverse coded and combined with the positive items to produce one scale ( $\alpha$ 's at W2 and W5 = .72 and .70) reflecting to what degree students perceive positive peer interactions at school.

*Demographics.* Students' grade point average (GPA; ranging from 0.00-4.00), gender, and grade level were provided by the district. GPA and grade level were treated as continuous variables in the analyses.

## Results

### *Preliminary analysis*

Preliminary analyses included six Confirmatory Factor Analyses (CFA's using AMOS20) to examine the three-factor model for social goals (i.e., development, demonstration-approach and demonstration-avoidance) within each wave. Model fit indexes consistently supported the three-factor model for all six waves, which was significantly better than two- or one-factor models (see Table 1). Correlations between social goals within each wave demonstrated similar patterns to previous studies (e.g., Ryan & Shim, 2008) in that development goals were non- to moderately correlated with demonstration-approach ( $r$ 's ranged from  $-.03$  to  $.15$ ) and with demonstration-avoidance ( $r$ 's ranged from  $.06$  to  $.15$ ), whereas demonstration-approach and avoidance goals were highly correlated ( $r$ 's ranged from  $.57$  to  $.69$ ,  $p$ 's  $< .001$ ). See Table 2 for descriptive statistics and scale reliabilities across all waves and Table 3 for correlations.

Two additional CFA's were tested to estimate the fit of the three-factor model for classroom academic goal structures, which included classroom mastery goal structure, performance-approach goal structure and performance-avoidance goal structure. Students' perceptions of the goal structures were assessed once a year, at the 2<sup>nd</sup> and 5<sup>th</sup> waves. Model fit indexes supported the three-factor model (W2:  $\chi^2 = 114.6$ ,  $df = 41$ ,  $p < .001$ , CFI = .96, NFI = .95, RMSEA = .05; W5:  $\chi^2 = 130.6$ ,  $df = 41$ ,  $p < .001$ , CFI = .95, NFI = .93, RMSEA = .05), which was significantly better than two-factor (W2:  $\Delta\chi^2(2) = 154$ ,  $p < .001$ ; W5:  $\Delta\chi^2(2) = 72.8$ ,  $p < .001$ ) or one-factor (W2:  $\Delta\chi^2(3) = 798$ ,  $p < .001$ ; W5:  $\Delta\chi^2(3) = 744$ ,  $p < .001$ ) models.

Zero-order correlations at waves 2 and 5 (when classroom goals structures and peer climate were assessed in addition to social goals) provided further support for construct validity. For example, development social goals were positively associated with perceived academic classroom mastery goal structure and negatively with performance-avoidance goal structure. Demonstration-avoidance social goals were not associated with classroom mastery goal structure, positively with performance-avoidance goal structure, and negatively with perceived peer climate (see Table 3 for the zero-order correlation matrix).

The correlations between each pair of sequential waves were high for development ( $r$ 's ranged from .55 to .67,  $p$ 's < .001), demonstration-approach ( $r$ 's ranged from .57 to .67,  $p$ 's < .001), and demonstration-avoidance ( $r$ 's ranged from .51 to .62,  $p$ 's < .001) social goals. These findings demonstrate relative stability of social goals within person, however, the remaining variation in social goals allowed us to explore the developmental trajectory of each goal.

#### *Non-linear growth curve analysis*

The primary method of analysis was non-linear growth-curve analysis using Hierarchical Linear Modeling (HLM; Raudenbush & Bryk, 2002). For each outcome we followed a building-up approach to identify a model that was parsimonious and informative (Nezlek, 2008). As shown in Table 4, at step one, for each social goal we explored whether linear, quadratic and cubic curves, fixed and random for each slope, best fit the data based on deviance statistics, with the goal of retaining slopes that do not worsen the fit. For all slopes, time was centered on the second wave of data collection when perceived school contextual factors were initially assessed. At step two, we added the predictors for just the intercept, and then added only one slope at a time without any predictors. Next we added predictors for each of the slopes, testing a range of potential combinations and examining the deviance scores. The predictor variables included

gender, grade level, GPA, classroom goal structures (i.e., mastery, performance-approach, and performance-avoidance), and peer climate. At step three we explored the change in fit if predictors were only added for one part of the model (e.g., only on the linear slope, when the intercept and other slopes were included). At step four, we added only the robust predictors that were significant when controlling for all other variables. Among the options that included significant predictors on the slopes, we chose the model with the lowest deviance score. This procedure enabled us to identify the most parsimonious model compared to alternative models while still including as much information as possible, resulting in a final two-level model for predicting developmental goals (Equation 1), demonstration-approach goals (Equation 2) and demonstration-avoidance goals (Equation 3):

Level 1

$$DEV = \pi_0 + \pi_1*(Linear) + \pi_2*(Quadratic) + \pi_3*(Cubic) + e_0$$

Level 2

$$\begin{aligned}\pi_0 &= \beta_{00} + \beta_{01}*(Gender) + \beta_{02}*(GPA) + \beta_{03}*(MasGS) + \gamma_0 \\ \pi_1 &= \beta_{10} + \beta_{11}*(Gender) + \beta_{12}*(Grade) + \gamma_1 \\ \pi_2 &= \beta_{20} + \beta_{21}*(Gender) + \beta_{22}*(Grade) + \gamma_2 \\ \pi_3 &= \beta_{30} + \gamma_3\end{aligned}$$

[Equation 1]

Level 1

$$DAP = \pi_0 + \pi_1*(Linear) + \pi_2*(Quadratic) + \pi_3*(Cubic) + e_0$$

Level 2

$$\begin{aligned}\pi_0 &= \beta_{00} + \beta_{01}*(Gender) + \beta_{02}*(PavGS) + \gamma_0 \\ \pi_1 &= \beta_{10} + \beta_{11}*(PavGS) + \gamma_1 \\ \pi_2 &= \beta_{20} + \gamma_2 \\ \pi_3 &= \beta_{30} + \gamma_3\end{aligned}$$

[Equation 2]

Level 1

$$DAV = \pi_0 + \pi_1*(Linear) + \pi_2*(Quadratic) + \pi_3*(Cubic) + e_0$$

Level 2

$$\begin{aligned}\pi_0 &= \beta_{00} + \beta_{01}*(Gender) + \beta_{02}*(Grade) + \beta_{03}*(GPA) + \beta_{04}*(PavGS) + \beta_{05}*(PEER) + \gamma_0 \\ \pi_1 &= \beta_{10} + \beta_{11}*(PEER) + \gamma_1 \\ \pi_2 &= \beta_{20} + \gamma_2 \\ \pi_3 &= \beta_{30} + \gamma_3\end{aligned}$$

[Equation 3]

We found that the random cubic slope, with predictors for the intercept and the linear and quadratic slopes, best fit the data for development goal trajectories and explained 22.7% of the level-1 variance. In general, students reported an increase of development goals that later decreased and then plateaued. For both demonstration-approach and demonstration-avoidance goals, a cubic random slope with predictors only on the intercept and the linear slope best fit the data and explained 22.3% and 18.1% of the level-1 variance, respectively. The trajectory demonstrated an early increase in demonstration-approach goals that later changed to decrease and then to be relatively flat. Demonstration-avoidance goals had a constant reported decline.

Results of the final growth curve for social development goals indicated that gender, GPA and perceived classroom academic mastery goal structure were significantly associated with initial levels of development social goals, explaining a total of 20.1% of the variance (Table 5). Females, students with higher achievement, and students' with higher perceptions of teachers as promoting academic mastery goals reported higher levels of social development goals. Grade level and gender also significantly predicted the development of this social goal across time. Younger students initially increased in their development goal to a greater extent as compared to older students (Figure 1). Females reported an increase in their social development goal at a greater pace compared to males, which later decreased equally for both genders (Figure 2).

The social demonstration-approach goal intercept was negatively predicted by gender and positively by perceived academic performance-avoidance goal structure. Males and students who perceived a higher level of classroom performance-avoidance goal emphasis reported higher levels of demonstration-approach goals, and these variables explained 17.7% of the variance (Table 5). Furthermore, perceptions of teacher emphasis on academic performance-avoidance goals negatively predicted this decline (Figure 3). This finding indicates that higher levels of

perceived performance-avoidance goal structure led to a slightly greater decline in social demonstration-approach goals. Note that this effect is relatively small, and students with higher perceptions of academic performance-avoidance goals had higher levels of social demonstration-approach goals at all time points.

Initial levels of demonstration-avoidance goals were positively associated with grade level, GPA and perceived classroom performance-avoidance goal structure, and were negatively associated with gender and peer climate. Students from higher grade levels, higher achievers, and students with higher perceptions of classroom performance-avoidance goals reported higher levels of social demonstration-avoidance goals. Females and students with higher perceptions of positive peer climate reported lower levels of demonstration-avoidance goals. These predictors explained 17.0% of the variance (Table 5). Peer climate also predicted the development of demonstration-avoidance goals across time indicating that students who perceived a more positive peer climate reported more stable demonstration-avoidance goals (i.e., decreased less) across time (Figure 4), although again this effect is relatively small.

All of the final growth curve models were re-run without classroom performance-avoidance goals given that performance-avoidance and performance-approach goals were significantly correlated and could potentially cause suppression, and none of the results changed.

#### *Piecewise growth curve analysis*

We expected that transitioning between different contexts at school (i.e., moving from a high level of perceived classroom mastery goal structure to a performance goal structure or vice versa) would predict changes in reported social goals. In order to test this hypothesis we conducted piecewise growth curve analysis (Raudenbush & Bryk, 2002) in which each school year represented independent linear growth. Waves 1-3 are labeled as piece 1 (P1) and waves 4-6

are labeled as piece 2 (P2), all centered at Wave 2 when the climate factors were initially assessed (P1: -1, 0, 1, 2, 3, 4; P2: -1, -1, -1, 0, 1, 2). The analysis thus included two linear pieces (one for each school year, see Equation 4) with gender, grade level, GPA, perceived classroom goal structures (i.e., mastery, performance-approach, and performance-avoidance), and perceived peer climate entered as predictors of the intercept and P1 (Equation 5), and gender, grade level, GPA, and changes in the level of classroom goal structures and peer climate between year 1 and 2 of the study (calculated by subtracting each classroom goal structure and peer climate variable measured at wave 5 from those measured at wave 2; see Equation 6) entered as predictors of P2.

$$Goal_{ti} = \pi_{0i} + \pi_{1i}*(TimeP1) + \pi_{2i}*(TimeP2) + e_{ti}$$

[Equation 4]

$$\pi_{0i} = \beta_{00} + \beta_{01}*(Gender) + \beta_{02}*(Grade) + \beta_{03}*(GPA) + \beta_{04}*(MasGS) + \beta_{05}*(PapGS) + \beta_{06}*(PavGS) + \beta_{07}*(PEER) + \gamma$$

[Equation 5]

$$\pi_{2i} = \beta_{20} + \beta_{21}*(Gender) + \beta_{22}*(Grade) + \beta_{23}*(GPA) + \beta_{24}*(MasGS Diff) + \beta_{25}*(PapGS Dif) + \beta_{26}*(PavGS Diff) + \beta_{27}*(PEER Diff) + \gamma$$

[Equation 6]

The results regarding intercepts were consistent with findings from the growth curve analysis (Table 6), however, only gender and grade level predicted the first year linear slope, and only for social development goals. Females and students in lower grade levels reported a higher rate of increase in their social development goals. Interestingly, the differences in perceived classroom goal structures and peer climate consistently predicted the trajectories of social goals within the second year of the study. Specifically, transitioning from a high level of perceived academic performance-avoidance goal structure to lower levels from year 1 to year 2 predicted



an increase in social developmental goals and a decrease in both demonstration-approach and avoidance social goals across year 2 (Figures 5 & 6). Transitioning from a high level of perceived peer climate to a lower level predicted an increase in both demonstration-approach and avoidance social goals (Figure 7). The coefficients and variance explained for the piece-wise analyses for each social goal are provided in Table 6.

### **Discussion**

This longitudinal study examined trajectories of students' social goals during high school as well as how relevant personal and contextual factors are associated with the development of these trajectories. Understanding changes in students' social goals over time is critical in light of the recent push to promote students' positive interpersonal relationships in school through socio-emotional learning (Durlak, Weissberg, Dymnicki, Taylor, & Schellinger, 2011). Furthermore, understanding the development of social goals is meaningful given the role of these goals for other important outcomes, such as students' adaptive interactions with their peers (e.g., Rodkin et al., 2012) and academic help seeking at school (e.g., Roussel, Elliot, & Feltman, 2011). Our analysis examined the relationship between students' gender, grade level, academic achievement, perceived classroom achievement goals, and perceived peer climate with initial levels of the three social goals and trajectories of these goals across two years. Additionally, we examined how a perceived transition into a more or less adaptive context at school predicted trajectories of the social goals within each school year. The findings presented here provide new insights into changes in social goals over time during the developmental stage of late adolescence.

#### *The Development of Social Goals*

Understanding how students' approaches to their peer relationships change over time is critical during adolescence, a stage marked by developmental and contextual fluctuations. Not

surprisingly given the stability of goal orientations and the frequent measurement of the goals within the study, social goals were moderately stable across two school years among our sample. On average, students reported higher goals for developing friendships than for demonstrating popularity or avoiding appearing unpopular throughout the two years. The use of linear and non-linear growth trajectories allowed us to assess several different types of changes over time, with the goal of capturing the most natural trajectories of social goal development. Social development goals slightly decreased over time, while demonstration-approach goals decreased in year one and then leveled out by the end of year two and demonstration-avoidance goals increased in the middle of the year and then decreased by the end of the two years. Despite some stability, we found that social achievement goals are also sensitive to perceptions of the educational context, which is analogous to how others have conceptualized social achievement goals (e.g., Ryan & Shim, 2006). Our analysis of social goal trajectories provides empirical support for the conceptualization of social goals as both trait-like and state-like; social goals are quite stable from a broad perspective of measuring changes in social tendencies during high school, yet if focusing on the role of contextual influences, they are also malleable.

#### *The Role of Individual Background Variables*

This study included students' gender, prior achievement, and grade level as predictors of initial levels and trajectories of social development, demonstration-approach, and demonstration-avoidance goals. Our results conform to prior literature by demonstrating that females report higher social development goals and lower demonstration-approach goals than males (e.g., Kiefer et al., 2013), and we additionally found that males reported higher demonstration-avoidance social goals. Furthermore, females also increased in social development goals more quickly than males. The study included academic achievement because students' achievement

could indirectly be associated with students' social motivation through its influence on students' confidence and general well being at school (Verboom, Sijtsema, Verhulst, Penninx, & Ormel, 2014). Students' GPA was positively associated with development goals and to a lesser extent with demonstration-avoidance goals. In other words, students with higher academic achievement are more likely to report higher goals to develop high quality relationships with their peers and to a lesser extent—perhaps among students who are anxious about appearing smart at the cost of their popularity—to avoid appearing unpopular. Importantly, many of these differences likely started occurring prior to high school, as evidenced by similar gender patterns among social goals in middle school (Kiefer et al., 2013). It is critical that students with lower academic achievement and male students be given encouragement and opportunities to develop positive attitudes toward interacting with their peers because their lower social development goals could result in less-adaptive engagement and lower help seeking with their peers at school, which in turn could lead to even lower achievement and create a negative cycle throughout high school.

Our longitudinal study included a cross-sectional design through the inclusion of students from each of the high school grade levels and examination of grade level as a predictor of the slopes of social development, demonstration-approach, and demonstration-avoidance goals. Results determined that older students had higher levels of goals to avoid appearing unpopular (i.e., demonstration-avoidance goals) compared to younger students. Furthermore, in examining the trajectories, we found that social development goals, the most adaptive social goals (e.g., Rodkin et al., 2012), varied significantly more across the school year for younger cohorts compared to older cohorts. As we predicted from other longitudinal studies (e.g., Archambault et al., 2010), younger students who have just transitioned to high school reported less stability in their goals across the year, while those who have had a year or more to adjust to the transition to

high school were more stable. A possible explanation for this post-transition fluctuation of social goals might be explained by a temporary boost in positive perceptions of school climate that occurs right after transitions to new school environments (Booth & Gerard, 2012). Students might perceive this transition as an opportunity to improve social networks and therefore emphasize social development goals. Once students are adjusted to the new school context, their social goals could then return to their initial levels prior to the transition. Although recent studies have focused on recommendations for improving academic aspects of school transitions (e.g., Carolan, Weiss, & Matthews, 2013), we suggest that high schools should also be sensitive to social aspects of school transitions. In particular, educators should note the malleable nature of 9<sup>th</sup> graders' social motivation levels and respond accordingly by promoting these students' desire to have high quality friendships early on during their first year at school. Furthermore, socio-emotional learning programs targeted at first-year students, such as freshman orientation programs, or social-bonding programs targeted at older students to counteract their higher levels of demonstration-avoidance goals, may be especially helpful.

#### *The Role of the School Context*

Our findings on changes in social achievement goals demonstrate that despite general stability, these goals are also sensitive to students' perceptions of the educational context, which highlights the important role of teaching and school culture in maintaining adaptive social goals. The analyses included perceptions of the peer climate and classroom goal structure as predictors of initial levels and trajectories of development, demonstration-approach, and demonstration-avoidance social goals.

Students' perceptions of a mastery classroom structure were associated with higher levels of reported development goals, while perceptions of a performance-avoidance classroom

structure were associated with higher levels of reported demonstration-approach and demonstration-avoidance goals. Across time, students who perceived that their teachers emphasize competition decreased slightly less in their demonstration-approach goals. This small but unexpected effect may be indicative of a “floor effect” in the longitudinal analysis. Students with maladaptive perceptions of the classroom goal structure may have more potential to decrease in demonstration-approach goals, whereas those who perceive a low performance-avoidance goal structure at school may already be at the minimum level of social demonstration-approach goals. In any case, this warranted the piece-wise analysis, which found relationships in the expected direction. Specifically, students who perceived an increase in the emphasis on avoiding appearing academically incompetent at school (i.e., academic performance-avoidance goal structures) from year one to year two decreased in their reported social goals to have high quality relationships with their peers (i.e., development goals) and increased in their goals to appear looking popular or to avoid looking unpopular (i.e., demonstration goals). Therefore perceived changes in the most maladaptive classroom goal structure seem to have the most influence on the development of students’ social goals. Our findings of the role of goal structures on students’ own social goals builds upon the important work conducted by Shim et al. (2013), and adds to the literature in several ways: a) we examined three types of classroom goals (e.g., Midgley et al., 2000) rather than two, b) we focused on high school students rather than middle school students, and c) we expanded empirical support for goal structures through examining how goal structures (and changes in goal structures) predicted trajectories of social goals rather than just mean levels. Our results suggest that classrooms should emphasize academic mastery goals and de-emphasize performance-avoidance goals (see Meece, Anderman, & Anderman, 2006 for recommendations) to encourage the development of adaptive social goals.

Perceived peer support was also predictive of changes in students' social goals during high school. In Kiefer et al. (2013), 6<sup>th</sup> graders' perceptions of peer support positively related to development social goals but did not significantly relate to dominance or popularity goals. Although the zero-order correlations in our study indicated that positive peer climate was associated with social development goals, the final analyses revealed a different yet also favorable outcome—students who perceived high levels of positive peer climate reported lower demonstration-avoidance goals. However, students with higher levels of positive peer climate decreased less in their demonstration-avoidance goals over time. This unexpected finding again may be indicative of a “floor effect” within the longitudinal analysis. The results highlight the importance of examining growth models in conjunction with the piecewise analysis. Students who perceived a positive increase in peer climate at school had a negative change in their demonstration-avoidance goals across the school year. Therefore perceived peer support functioned by decreasing students' reported concern about looking unpopular or trying to avoid being made fun of, or in other words, lowered students' social inhibitions. These findings suggest the need for schools to focus on promoting a positive peer climate, possibly through socio-emotional learning programs and anti-bullying efforts. In general, however, perceptions of classroom academic goal structures were more predictive than perceptions of peer climate for the initial levels and trajectories of the social goals. One explanation is that teachers design the classroom environment and structure classroom activities that shape students' social motivation. For example, a demonstration-avoidance oriented classroom may encourage students to be conscious of whether they are doing worse academically than others, which could lead to a focus on comparisons and hence demonstration-oriented social goals. A second explanation is the matched specificity of the social goal and classroom goal measures compared to the more

general peer climate measure. A measure of peer goals that assesses the achievement orientation of the peers that a student hangs out with at school (e.g., calculating the average academic or social goals at the peer group level) could possibly be more predictive of students' social goals.

#### *Caveats and Future Research*

The use of non-linear growth curve and piece-wise growth curve analyses in the study provided a comprehensive understanding of change in goals over time, including how perceptions of the school context were associated with those changes. Although the effect sizes in the study ranged from small to moderate, they were quite meaningful because of the vast stability in these goals over time, especially given that measures were collected every four months, a short period for detecting change compared to typical longitudinal studies which assess students once or twice a year (e.g., Archambault et al., 2010; Daniels et al., 2009). Furthermore, the results are substantial given that in addition to decreasing variance over time because of measures conducted across six waves, our models simultaneously controlled for other variables including grade level, achievement, gender, and perceptions of peer climate and classroom climate. If we were to imagine the contextual effects compounded over many years, for example, if a student were to constantly face a maladaptive academic and social climate throughout all of middle and high school, then the associations could be more severe.

There are several caveats of the study, which are standard in survey studies. The one school sample may limit generalizability, so these results should be replicated across different schools to determine whether these findings are normative. When filling out the measures of social goals, classroom goal structures, and peer climate, students were instructed to consider all of their classes. It is possible that students may have variant experiences across classes and could vary in their social goals across different contexts, which should be examined in future studies.

The measures were self-report due to the fact that social goals, by definition, are subjective in nature (Shim & Ryan, 2012), however, peer and classroom climate could be triangulated in future work with observational studies or teacher reports. Finally, there was missing data due to permissions, absenteeism, and student mobility, compounded by the multiple-wave research design. It is possible that the reasons data are missing may be related to some student characteristic not assessed in the current study. Despite these limitations, strengths include the relatively large sample size and collection of six waves of longitudinal data across two school years, which make the assessment of change more accurate.

Our findings that individual and contextual factors predict initial levels and trajectories of social goal development indicate the need to continue exploring other factors that predict students' social goals, including potential interactions between individual and contextual factors. Previous research has examined social goals during the transition from elementary to middle school (Kiefer et al., 2013); we would also recommend an examination during the transition from middle to high school. Given that the three social goals in this study are not independent, future researchers may also wish to use person-centered analytical approaches and examine the role of contextual effects on profiles of social goals. Furthermore, the conceptualization of social goals needs clarification because terminology varies widely across the literature. Within the last few years, the most adaptive social goal has been labeled variously as a social development goal (Ryan & Shim, 2008; Shim & Ryan, 2012; Shim et al., 2013), intimacy goal (Kiefer et al., 2013), prosocial goal (Wentzel et al., 2012), communal goal (Ojanen, Smith-Schrandt, & Gesten, 2013), or friendship-approach goal (Roussel et al., 2011). Although conceptually these can be argued as unique because they focus on goal orientation, goal content, or approach vs. avoidance orientation, the operationalization of these goals is quite similar across studies. As called for by



others (e.g., King & Watkins, 2012), there is a need for coherence in the study of social goals, not only in their conceptualization, but more importantly, in understanding the nuances in how we measure social goals and how these nuances may (or may not) impact findings across studies.

### *Conclusions*

Learning in high school is a social endeavor. Students learn in collaboration with, or at least in the company of, their peers. During high school, peer relationships increase in salience and students' goals for their peer relationships predict how they interact with those peers. Despite the importance of social motivation at school, research on social goals has been scarce compared to academic goals, and in particular, there have been a lack of studies on social goal development. This study used contemporary growth curve analysis to measure trajectories of social goals across two years of high school. Students differed in their initial levels of social goals based on their gender, grade level, prior achievement, as well as their initial perceptions of classroom goal structures and peer climate. Despite some stability over time, social goals fluctuated during high school, more so for freshmen than for older grades. These fluctuations could be predicted by students' perceptions of classroom goal structures at school and peer climate. In particular, when students reported an increase across time in their teachers' use of more maladaptive teaching practices (e.g., an emphasis on academic comparison and avoiding looking incompetent), they in turn decreased in their reported goals to develop meaningful friendships with their peers and increased in their reported goals to appear popular or avoid looking unpopular. These results lay the groundwork for future researchers to continue examining the development of social goals in school and how schools can encourage students to adopt adaptive social goals.

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## Footnotes

1. The measure used is based on Ryan's early scale development, cited in Horst et al. (2007), and contains a slight difference in the operationalization of social development goals from Ryan and Shim (2008). Ryan and Shim's scale focuses on learning how to be a good friend (e.g., "I like it when I learn better ways to get along with friends", p. 679). The measure used here focuses on goals for initiating or maintaining friendships rather than learning how to do so (e.g., "It is important to me to have friends who really understand me"; Horst et al., 2007). Items assessing demonstration-approach and avoidance social goal were identical to Ryan and Shim (2008).

Table 1

*Model Fit Indexes for Confirmatory Factor Analyses*

wave	$\chi^2$ (df)	$p$	CFI	NFI	RMSEA	$\Delta\chi^2$ (df)	$\Delta\chi^2$ (df)
		value				DAP+DAV	One factor
1	244.1 (62)	< .001	.95	.93	.06	418.7 (2)	1697 (3)
2	230.1 (62)	< .001	.96	.95	.06	555.0 (2)	2226 (3)
3	301.6 (62)	< .001	.95	.94	.07	623.1 (2)	2730 (3)
4	335.3 (62)	< .001	.95	.94	.07	665.0 (2)	3108 (3)
5	231.7 (62)	< .001	.96	.95	.06	526.3 (2)	2459 (3)
6	360.4 (62)	< .001	.93	.92	.08	604.7 (2)	2198 (3)

*Note.* DAP+DAV – a two-factor model which combine demonstration-approach and avoidance social goals; all  $\Delta\chi^2$ 's were significantly different ( $p$ 's < .001) from three-factor model.

Table 2

*Descriptive Statistics Across All Waves*

Wave	1	2	3	4	5	6	Chronbach's $\alpha$ 's range
DEV	4.12 (.83)	4.15 (.83)	4.08 (.94)	4.02 (.93)	3.96 (.94)	4.04 (.91)	.81-.90
DAP	2.19 (.89)	2.14 (.90)	1.96 (.83)	1.88 (.79)	2.04 (.84)	1.88 (.80)	.80-.87
DAV	2.24 (.88)	2.29 (.90)	2.11 (.89)	1.94 (.85)	2.25 (.90)	1.95 (.86)	.74-.85
MasGS	N/A	2.93 (.47)	N/A	N/A	2.76 (.49)	N/A	.74-.78
PapGS	N/A	2.01 (.61)	N/A	N/A	2.05 (.58)	N/A	.66-.69
PavGS	N/A	1.80 (.66)	N/A	N/A	1.96 (.62)	N/A	.80-.82
PEER	N/A	3.12 (.44)	N/A	N/A	3.09 (.43)	N/A	.70-.72

*Note.* Table includes means and standard deviations (within brackets); DEV – development social goal; DAP – Demonstration-approach social goal; DAV – Demonstration-avoidance social goal; MasGS – classroom mastery goal structure; PapGS – classroom demonstration-approach goal structure; PavGS – classroom demonstration-avoidance goal structure; PEER – perceived peer climate; N/A – measure was not assessed at wave.

Table 3

*Correlations Matrix for All Variables at Waves 2 and 5*

	DEV	DAP	DAV	MasGS	PapGS	PavGS	PEER
DEV	-	.15 <sup>c</sup>	.15 <sup>c</sup>	.19 <sup>c</sup>	-.06	-.12 <sup>b</sup>	.05
DAP	-.01	-	.60 <sup>c</sup>	-.05	.29 <sup>c</sup>	.38 <sup>c</sup>	.02
DAV	.09 <sup>a</sup>	.65 <sup>c</sup>	-	-.04	.21 <sup>c</sup>	.33 <sup>c</sup>	-.07 <sup>a</sup>
MasGS	.17 <sup>c</sup>	.06	.02	-	-.14 <sup>c</sup>	-.01	.35 <sup>c</sup>
PapGS	-.11 <sup>b</sup>	.23 <sup>c</sup>	.16 <sup>c</sup>	.03	-	.49 <sup>c</sup>	-.12 <sup>b</sup>
PavGS	-.25 <sup>c</sup>	.34 <sup>c</sup>	.25 <sup>c</sup>	.08	.56 <sup>c</sup>	-	.00
PEER	.14 <sup>b</sup>	-.02	-.13 <sup>b</sup>	.36 <sup>c</sup>	-.16 <sup>c</sup>	-.03	-

*Note.* Correlations above the diagonal denote time 2 and underneath denote time 5; DEV – development social goal; DAP – Demonstration-approach social goal; DAV – Demonstration-avoidance social goal; MasGS – classroom mastery goal structure; PapGS – classroom demonstration-approach goal structure; PavGS – classroom demonstration-avoidance goal structure; PEER – perceived peer climate.

<sup>a</sup> $p < .05$ , <sup>b</sup> $p < .01$ , <sup>c</sup> $p < .001$ ; two-tailed.

Table 4

*Growth Curve Analysis Deviance Change*

Model	DEV		DAP		DAV	
	Deviance	$\Delta\chi^2$ (df)	Deviance	$\Delta\chi^2$ (df)	Deviance	$\Delta\chi^2$ (df)
<b>Unconditional</b>						
No predictors	6578.44	N/A	6367.05	N/A	7039.53	N/A
<b>Step 1: Level-1</b>						
Linear Slope						
Fixed	6569.04	N/A	6270.38	N/A	6978.81	N/A
Random	6488.47	80.57 (2) <sup>c</sup>	6202.54	67.83 (2) <sup>c</sup>	6924.36	54.45 (2) <sup>c</sup>
Quadratic Slope						
Fixed	6495.84	73.19 (2) <sup>c</sup>	6192.01	78.36 (2) <sup>c</sup>	6931.44	53.64 (2) <sup>c</sup>
Random	6466.62	29.22 (3) <sup>c</sup>	6191.20	1.19 (3)	6917.81	13.62 (3) <sup>b</sup>
Cubic Slope						
Fixed	6451.52	44.32 (3) <sup>c</sup>	6196.18	4.97 (3)	6925.91	5.53 (3)
Random	6406.68	44.84 (4) <sup>c</sup>	6193.95	2.75 (4)	6911.33	6.48 (4)
<b>Step 2: Level-2</b>						
Intercepts Predictors	6482.72	N/A	6290.43	N/A	6996.59	N/A
with linear	6393.65	89.07 (2) <sup>c</sup>	6122.95	167.5 (2) <sup>c</sup>	6875.80	120.8 (2) <sup>c</sup>
with quadratic	6375.13	18.51 (3) <sup>c</sup>	6115.15	7.79 (3) <sup>a</sup>	6875.35	0.45 (3)
with cubic	6311.46	63.66 (4) <sup>c</sup>	6094.56	20.58 (4) <sup>c</sup>	6865.90	9.45 (4)
Predictors Linear	6433.32	49.40 (2) <sup>c</sup>	6166.23	123.8 (2) <sup>c</sup>	6913.63	82.95 (2) <sup>c</sup>
with quadratic	6411.96	21.36 (3) <sup>c</sup>	6154.67	11.56 (3) <sup>b</sup>	6908.91	4.72 (3)
with cubic	6350.69	61.26 (4) <sup>c</sup>	6139.21	15.46 (4) <sup>b</sup>	6905.26	3.65 (4)
Predictors Quadratic	6447.38	14.08 (3) <sup>b</sup>	6206.01	48.60 (3) <sup>c</sup>	6960.07	46.44 (3) <sup>c</sup>
with cubic	6382.44	64.93 (4) <sup>c</sup>	6187.09	18.92 (4) <sup>b</sup>	6952.98	7.08 (4)
Predictors Cubic	6425.70	N/A	6241.13	83.72 (4) <sup>c</sup>	6998.85	38.78 (4) <sup>c</sup>
<b>Step 3: Predictors</b>						
Only Intercepts	6311.46	N/A	6094.45	N/A	6865.90	N/A
Only linear	6425.64	N/A	6207.42	N/A	6949.66	N/A
Only quadratic	6449.53	N/A	6232.23	N/A	6972.08	N/A
Only cubic	6477.17	N/A	6258.54	N/A	6995.86	N/A
<b>Step 4: Best model (only significant)</b>						
Intercepts Predictors	6296.97	N/A	6083.62	N/A	6859.17	N/A
with linear	6307.96	N/A	<b>6084.97*</b>	N/A	<b>6861.05*</b>	N/A
with quadratic	<b>6306.02*</b>	N/A	6111.66	N/A	6871.57	N/A
with cubic	6310.97	N/A	6115.23	N/A	6880.54	N/A

*Note.* DEV - development social goal; DAP – Demonstration-approach social goal; DAV -

Demonstration-avoidance social goal. <sup>a</sup> $p < .05$ , <sup>b</sup> $p < .01$ , <sup>c</sup> $p < .001$ ; at Step 1 the deviance score was compared to the deviance score of the next simplest slope; at Step 2 the deviance score was compared to the deviance score of the previous comparable model tested.



\* In bold – final models reported. The models include the most complex slope that did not have a worse fit on the model as well as predictors that were significant when controlling for all other variables. For the DEV model, the final analysis included significant predictors on the intercept, linear and quadratic slopes. For the DAP and DAV models, the final analysis included only significant predictors on the intercepts and linear slopes. For all three models, random linear, quadratic, and cubic slopes were included.

Table 5  
*Final Growth Curve Analysis Coefficients*

	DEV		DAP		DAV	
	$\gamma$	SE	$\gamma$	SE	$\gamma$	SE
For Intercept						
Intercept	3.96 <sup>c</sup>	.045	2.26 <sup>c</sup>	.044	2.31 <sup>c</sup>	.044
Gender	.40 <sup>c</sup>	.055	-.34 <sup>c</sup>	.054	-.23 <sup>c</sup>	.055
Grade level					.13 <sup>c</sup>	.031
GPA	.28 <sup>c</sup>	.040			.09 <sup>a</sup>	.042
MasGS	.22 <sup>b</sup>	.058				
PapGS						
PavGS			.32 <sup>c</sup>	.042	.22 <sup>c</sup>	.041
PEER					-.26 <sup>c</sup>	.072
For Linear Slope						
Intercept	.10 <sup>a</sup>	.050	-.24 <sup>c</sup>	.044	-.15 <sup>b</sup>	.049
Gender	.15 <sup>c</sup>	.044				
Grade level	-.08 <sup>c</sup>	.025				
GPA						
MasGS						
PapGS						
PavGS			-.02 <sup>a</sup>	.010		
PEER					.04 <sup>a</sup>	.019
For Quadratic Slope						
Intercept	-.10 <sup>c</sup>	.022	.07 <sup>c</sup>	.021	.04 <sup>a</sup>	.023
Gender	-.02 <sup>b</sup>	.008				
Grade level	.01 <sup>c</sup>	.004				
GPA						
MasGS						
PapGS						
PavGS						
PEER						
For Cubic Slope						
Intercept	.01 <sup>b</sup>	.003	-.01 <sup>b</sup>	.003	-.01 <sup>a</sup>	.003
Gender						
Grade level						
GPA						
MasGS						
PapGS						
PavGS						
PEER						
R <sup>2</sup>	Intercept	20.1%		17.7%		17.0%
R <sup>2</sup>	Linear	19.7%		0.6%		0.2%
R <sup>2</sup>	Quadratic	3.7%		N/A		N/A
R <sup>2</sup>	Cubic	N/A		N/A		N/A

*Note.* Gender is a dichotomous variable in which 0 – Males, 1 – Females; DEV - development social goal; DAP – Demonstration-approach social goal; DAV - Demonstration-avoidance social goal; MasGS – Mastery goal structure; PapGS – Performance-approach goal structure; PavGS – Performance-avoidance goal structure; PEER – perceived peer climate.

<sup>a</sup>  $p < .05$ , <sup>b</sup>  $p < .01$ , <sup>c</sup>  $p < .001$ .

Table 6

*Piecewise Growth Curve Analysis Coefficients*

		DEV		DAP		DAV	
		$\gamma$	SE	$\gamma$	SE	$\gamma$	SE
For Intercept							
	Intercept	3.90 <sup>c</sup>	.043	2.26 <sup>c</sup>	.045	2.33 <sup>c</sup>	.044
	Gender	.39 <sup>c</sup>	.055	-.31 <sup>c</sup>	.060	-.22 <sup>c</sup>	.059
	Grade level	.02	.035	.05	.034	.14 <sup>c</sup>	.034
	GPA	.26 <sup>c</sup>	.045	.05	.047	.10 <sup>a</sup>	.044
	MasGS (t2)	.22 <sup>c</sup>	.065	-.06	.065	-.02	.066
	PapGS (t2)	.06	.052	.07	.054	-.04	.056
	PavGS (t2)	-.08	.055	.33 <sup>c</sup>	.051	.28 <sup>a</sup>	.050
	PEER (t2)	.03	.068	.05	.062	-.24 <sup>b</sup>	.072
For P1 Slope							
	Intercept	-.07 <sup>b</sup>	.027	-.11 <sup>c</sup>	.027	-.06 <sup>a</sup>	.028
	Gender	.13 <sup>c</sup>	.033	-.04	.033	-.02	.038
	Grade level	-.07 <sup>c</sup>	.020	-.03	.019	-.01	.022
	GPA	-.04	.033	.00	.025	.01	.029
	MasGS (t2)	.05	.037	-.02	.031	-.01	.042
	PapGS (t2)	-.04	.030	-.01	.033	.00	.035
	PavGS (t2)	-.03	.030	-.02	.029	.00	.032
	PEER (t2)	-.02	.035	-.01	.040	.02	.045
For P2 Slope							
	Intercept	-.02	.018	-.02	.018	-.04 <sup>a</sup>	.020
	Gender	-.04	.023	.00	.022	.00	.025
	Grade level	.04 <sup>b</sup>	.014	.02	.013	-.01	.015
	GPA	.02	.020	.01	.015	.00	.017
	MasGS (t5-t2)	.04	.023	.02	.022	-.01	.026
	PapGS (t5-t2)	.01	.018	.02	.017	.03	.019
	PavGS (t5-t2)	-.05 <sup>b</sup>	.017	.05 <sup>b</sup>	.016	.05 <sup>b</sup>	.017
	PEER (t5-t2)	.00	.024	-.03	.023	-.07 <sup>b</sup>	.025
R2	P1 slope	15.7%		0.0%		6.6%	
R2	P2 Slope	7.6%		4.4%		3.2%	

*Note.* P1 – first piecewise slope (Waves 1 to 3); P2 – second piecewise slope (Waves 4 to 6); Gender is a dichotomous variable in which 0 – Males, 1 – Females; DEV - development social goal; DAP – Demonstration-approach social goal; DAV - Demonstration-avoidance social goal; MasGS – Mastery goal structure; PapGS – Performance-approach goal structure; PavGS – Performance-avoidance goal structure; PEER – perceived peer climate.

<sup>a</sup> $p < .05$ , <sup>b</sup> $p < .01$ , <sup>c</sup> $p < .001$ .

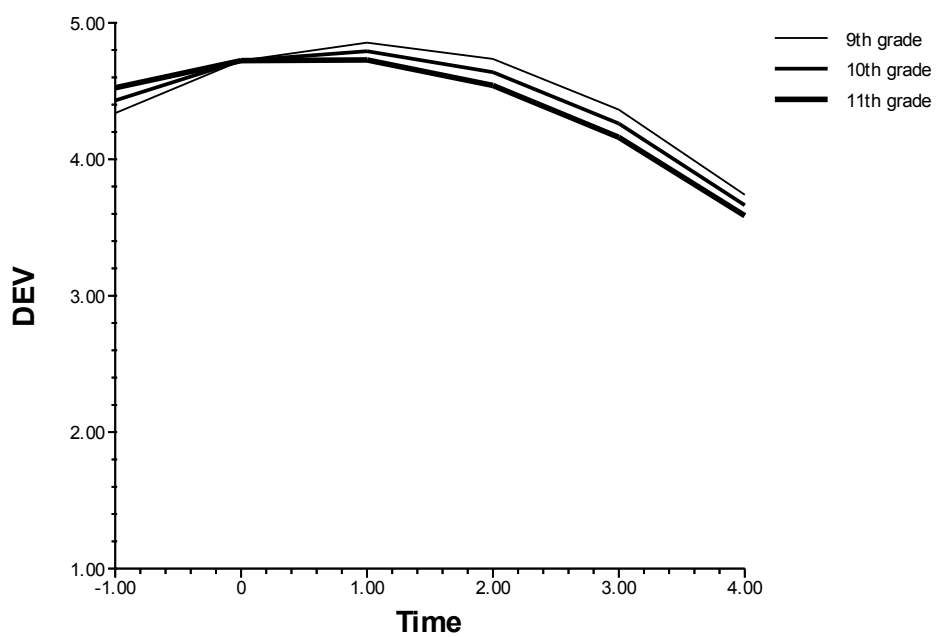


Figure 1. *Trajectories of development social goal by grade levels.*

*Note.* DEV – Development social goal.

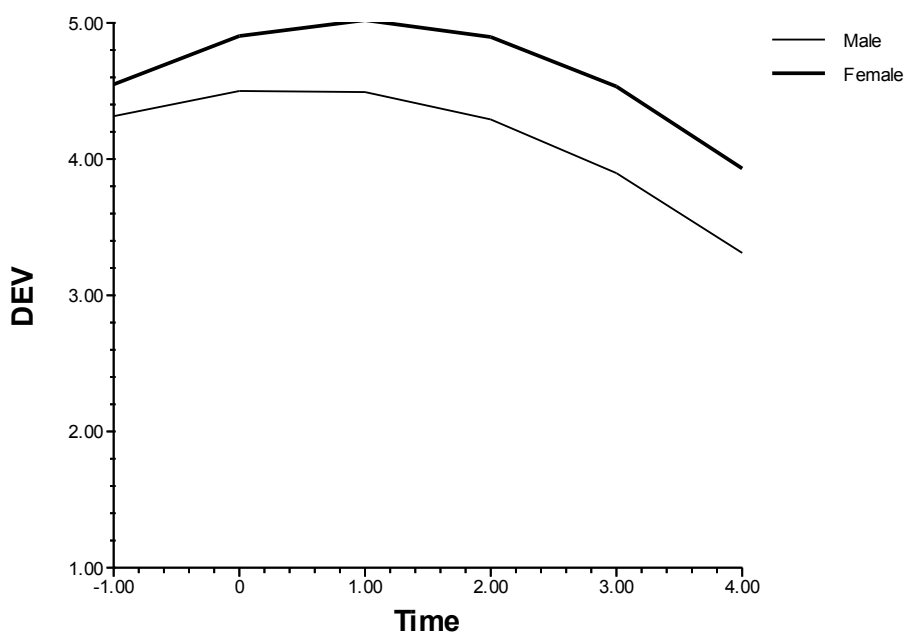


Figure 2. Trajectories of development social goal by gender.

Note. DEV – Development social goal.

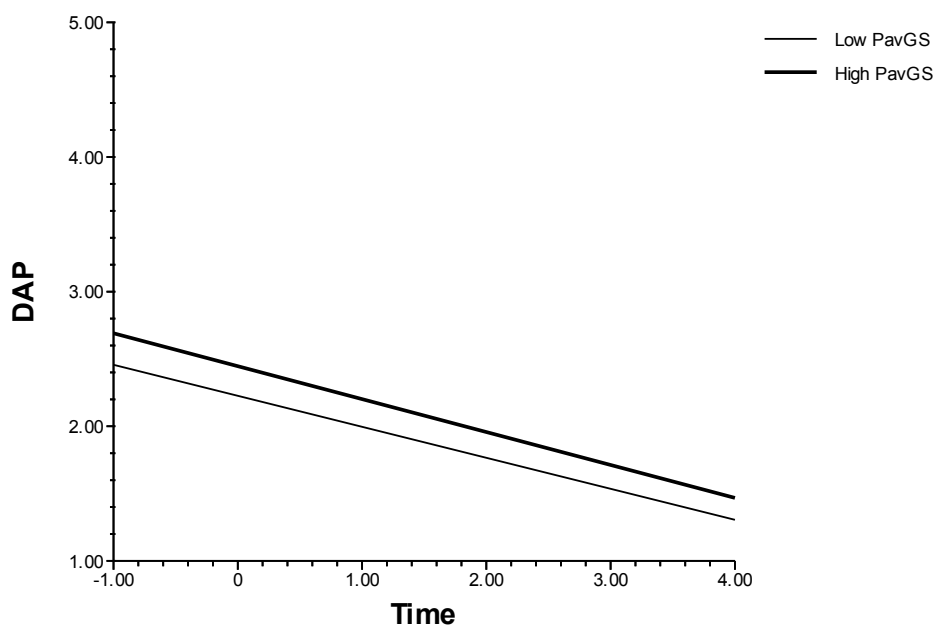


Figure 3. *Trajectories of demonstration-approach social goal.*

*Note.* DAP – Demonstration-approach social goal; PavGS – Performance-avoidance goal structure.

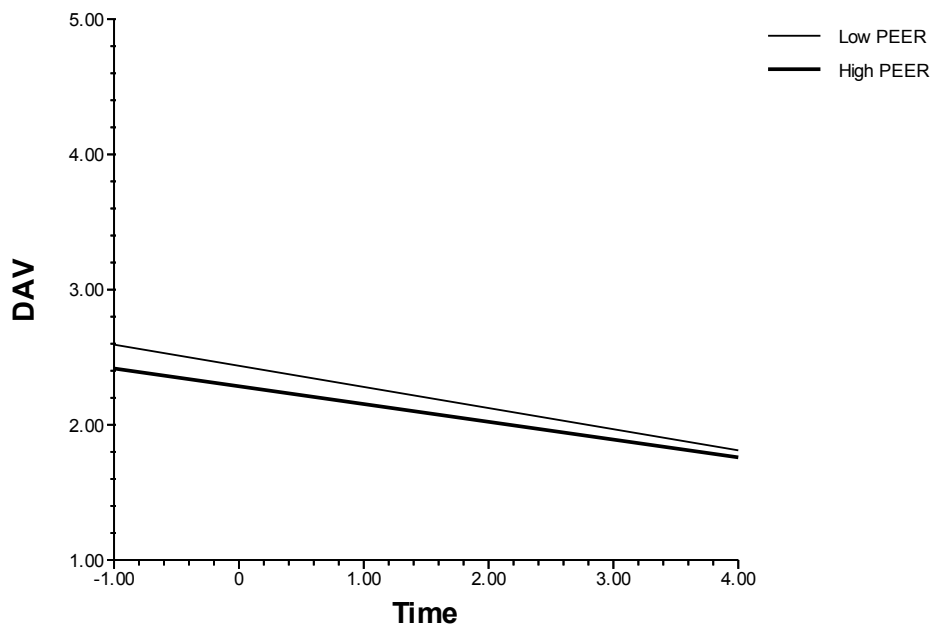


Figure 4. Trajectories of demonstration-avoidance goal by peer climate.

Note. DAV - Demonstration-avoidance social goal; PEER – perceived peer climate.

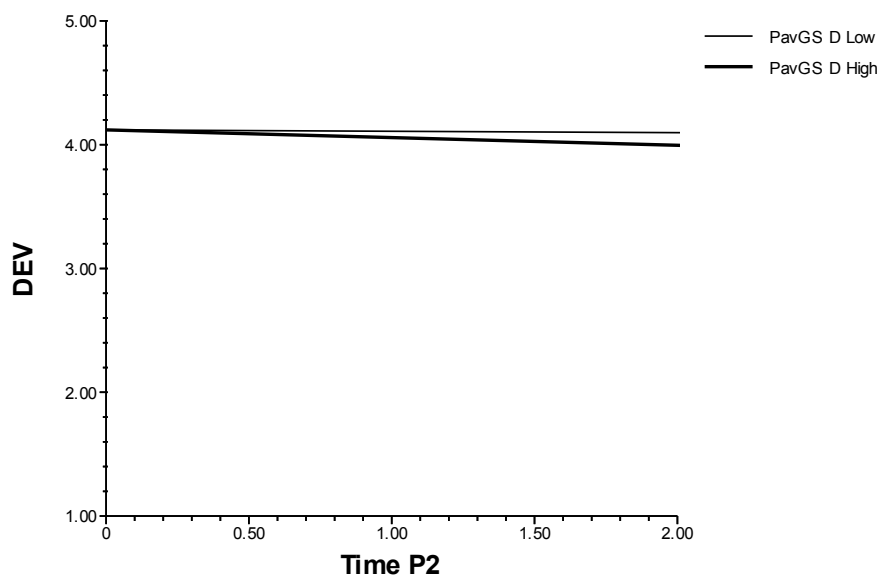


Figure 5. Trajectories of development social goal by classroom performance-avoidance goal structure at the second year of the study.

Note. DEV – development social goal; PavGS D – differences of perceived performance-avoidance goal structure between wave 5 and 2.



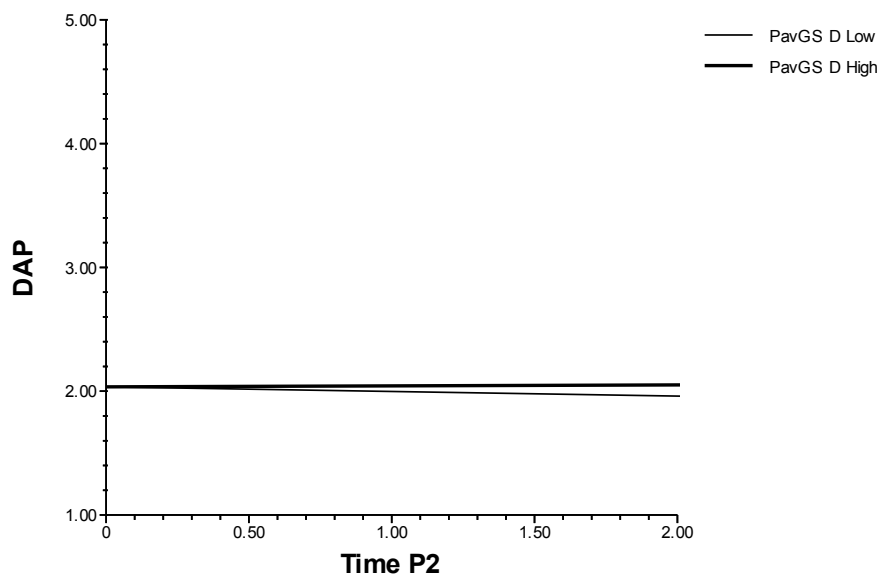


Figure 6. *Trajectories of demonstration-approach social goal by classroom performance-avoidance goal structure at the second year of the study.*

*Note.* DAP – demonstration-approach social goal; PavGS D – differences of perceived performance-avoidance goal structure between wave 5 and 2.

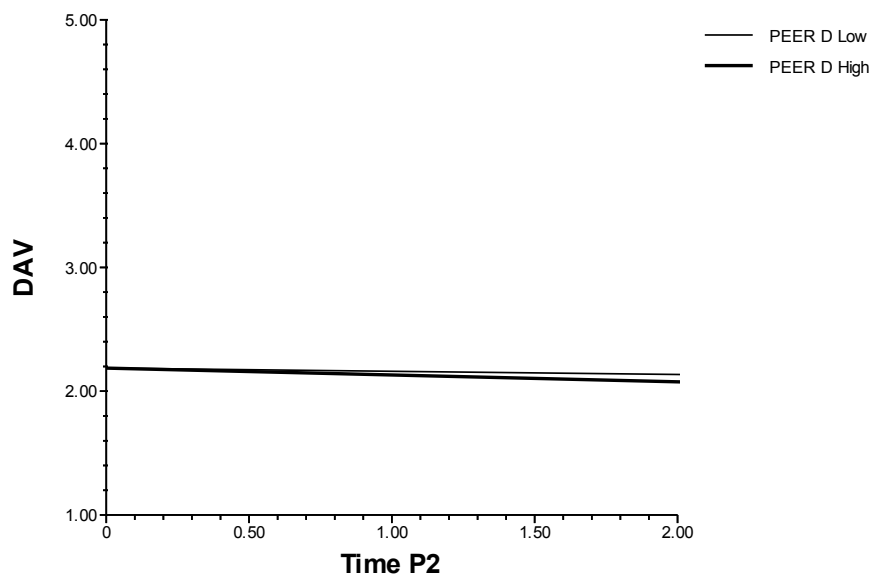


Figure 7. Trajectories of demonstration-avoidance social goal by peer climate at the second year of the study.

Note. DAV – demonstration-avoidance social goal; PEER D – differences of perceived peer climate between wave 5 and 2.