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Developmental Patterns of Social Trust between Early and Late Adolescence: Age and School Climate Effects

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Abstract

Social trust (i.e., beliefs that people are generally fair and trustworthy) is important to the functioning of democracies and trend studies show it has declined. We test hypotheses concerning the development of these beliefs in adolescence. Based on surveys of 1535 adolescents collected over two years, we find that middle and late adolescents had significantly lower levels of trust than early adolescents and that these beliefs became more stable and less related to interpersonal trust between early and late adolescence. Results of multiple group SEMs revealed that, regardless of age, adolescents' reports that a strong sense of student solidarity characterized their school significantly increased ST at T2, controlling for levels at T1, and opportunities to exchange perspectives with fellow students increased ST at T2 indirectly, through feelings of student solidarity. The study points to the role of schools in nurturing the democratic dispositions of younger generations.

Social trust reflects an individual's positive view of humanity, the belief that people generally treat others fairly rather than try to maximize their own gain at others' expense. Such views of humanity are important foundations for democratic societies because they are positively associated with cooperation, tolerance, volunteering, giving to charity, and participation in public affairs (Putnam, 2000; Uslaner, 2000). Individuals with high levels of social trust assume that even people who are different from them are part of their moral community and that they bear some responsibility for the welfare of these "others" (Flanagan, Gill, & Gallay, 2005; Uslaner, 2002).

Scholarly interest in social trust has increased of late due to concerns that it has declined. Trends over the past thirty years show that younger generations today also are less likely than their elders and than earlier cohorts of youth to have faith in humanity, i.e., to feel that "people in general" can be trusted (Pew Research Center, 2007; Rahn & Transue, 1998; Smith, 2005). Our understanding of social trust and its correlates is based primarily on studies of adults and there is some evidence that these beliefs are rather stable in adulthood. For example, one national longitudinal study found that the level of social trust expressed by a high-school senior in 1965 was highly predictive of the faith in humanity s/he reported in his/her mid thirties (Damico, Conway, & Damico, 2000; Jennings & Stoker, 2002; Stolle & Hooghe, 2003; Uslaner, 2002).

It seems reasonable to assume that the foundations of our faith in humanity are established prior to adulthood. Yet, there have been no studies of the developmental correlates of social

trust. However, research on early adolescents' lay theories about humanity is relevant. Dweck, Levy, and their colleagues have identified individual differences in early adolescents' lay theories about humanity with some youth adopting a fixed or entity view and others a view that people are malleable and can change. Although these scholars were not looking specifically at social trust, they did find that youth who believed people could change were less inclined than those holding entity views to judge others (Dweck, 1999; Erdley & Dweck, 1993; Levy & Dweck, 1999) or to stereotype outgroups such as homeless people. Those who believed in people's capacities for change also were more likely to see similarities between themselves and disadvantaged groups such as the homeless and to have a history of volunteering to help others (Karafantis & Levy, 2004). Thus, by early adolescence it appears that there are identifiable differences in youth's open-mindedness towards people and that correlates of social trust (tolerance, volunteering) also are correlates of these beliefs about humanity. However, we know little about the factors that contribute to youths' trust in humanity or how stable those beliefs are prior to adulthood.

In the current study we examine factors associated with adolescents' beliefs that people are generally fair and trustworthy (i.e., their social trust) with data over two years from a sample of early, middle, and late adolescents. First, we explore age differences in levels, stability, and correlates of social trust. Following that we look at patterns of social trust over two years with adolescents' reports of the relational climates at their school as predictors of changes in these beliefs.

The adolescent years are an ideal period to study the formation of social trust. Identity is focal and questions about one's own authenticity (Harter, 1999) and the trustworthiness of others (Flanagan, 2003) are salient. In addition, both the widening world of social experiences and the growth in socio-cognitive competence that occur during adolescence should affect beliefs about the trustworthiness of humanity. As adolescents age, they engage in a wider world of contexts and with more diverse groups of people. We know that social trust is inversely related to contextual diversity, in part because of the challenges of finding shared interests and norms with diverse others (Hardin, 2004; Phan, 2008). Furthermore, trust reflects social intelligence (Yamagishi, 2001) and differs from gullibility or naivete because it is informed by experience and good judgment and tempered by skepticism (Rotter, 1980). Thus, the wider and more diverse social experiences of older adolescents should mean that they are, on average, less naive and positive than early adolescents in their judgments about people.

The lion's share of the developmental research on trust has focused on interpersonal trust in friendships and it is likely that young people learn about the phenomenon of trust in those relationships since many of the elements of trust (being fair, loyal, true to one's word and accountable for one's actions) are issues that friends negotiate (Rotenberg, 1991). People who lack friends have lower levels of social trust (Uslaner, 2002) and are less likely to believe that others trust them, despite reports from peers to the contrary (Rotenberg, 1994). Thus, interpersonal trust between friends should provide a foundation for social trust. However, interpersonal and social trust are distinct: Whereas the former is based on knowledge of and experience with familiars, the latter reflects our beliefs about people in general. The distinction in the literature on social capital is that between thick vs. thin trust, the former rooted in and reinforced by regular contact and dense networks with people we know, the latter a more expansive but less intense trust in people we do not (Putnam, 2000).

Between early and late adolescence there is an increasing capacity to conceive of abstract groups (like humanity) and to differentiate aspects of the social world (Eisenberg & Sheffield Morris, 2004; Keating, 2004). Late adolescents, therefore, should be more likely than early adolescents to distinguish their general beliefs about humanity (social trust) from

their personal experiences (interpersonal trust). For example, compared to early adolescents, late adolescents are more likely to distinguish their general beliefs in a just world (i.e., that the world is fair and people generally get what they deserve) from their personal situation (i.e., that they themselves are usually treated fairly) (Dalbert & Sally, 2004).

Based on a review of relevant literature, we test the following hypotheses concerning developmental changes in the phenomenon of trust. First, we expect that social trust becomes more stable between early and late adolescence as the social representation of a generalized other crystallizes: In early adolescence, beliefs about humanity should be more malleable whereas by late adolescence, reports of social trust should be more stable. Second, based on the literature on friendship and trust, we expect that interpersonal trust will be positively but weakly related to social trust but that this relationship will diminish with age, i.e., late adolescents will be more likely to distinguish trust in humanity from trust in their friendships. The latter hypothesis is based on the growth between early and late adolescence in the capacity to differentiate aspects of the social world and to distinguish general beliefs from personal experience. Our third hypothesis concerns developmental differences in levels of interpersonal and social trust. In light of the widening social world of late when compared to early adolescents, we expect to find an age related decline in social trust as youth mature and their beliefs about humanity are less naïve, informed by some skepticism about people. However, we do not hypothesize any age-related changes in interpersonal trust since interpersonal trust should vary based on the quality of one's personal relationships.

Our final hypotheses concern the effects of school climates and transitions to new school settings on social trust. We argue that, when students' experiences at school a) make them feel like they're part of something larger than themselves and b) show them that they are trusted and respected by persons in authority, those experiences should have a positive impact on adolescents' social trust. We assess two dimensions of the school climate as reported by students: a) school solidarity and b) a democratic climate in which teachers encourage students to voice their opinions and respect the views of others. These have been identified as key elements of schools as caring communities that promote students' integration into the institution (Battistich, Solomon, Watson, & Schaps, 1997). Likewise, in research on effective schools, teachers identify similar dimensions of the organizational climate at school which Bryk and Schneider (2002) have labeled "relational trust". Teachers in more effective schools report: a) a sense of identification with the school and solidarity with fellow teachers and b) encouragement from the principal or authority figure to express their opinions (see also Tschannen-Moran & Hoy, 2000). Bryk and Schneider contend that relational trust enables innovation because it reflects an environment in which individuals share a moral commitment to act in the interests of the collective.

School solidarity

Psychologists have identified the need to belong to something larger than oneself as a fundamental human motivation which, when satisfied, has a positive effect on one's perceptions of others (Baumeister & Leary, 1995). Trust in others improves when people feel that they are part of a group (Tschannen-Moran & Hoy, 2000) and when the group fosters a spirit of cooperation and interdependence (Hardin, 2004; Williams, 2001). The feeling of being part of a group, of identifying as part of an organization or institution is related to cooperation, commitment, and a sense of responsibility for the whole (Pearce & Larson, 2006; Ryan & Deci, 2000) including personal sacrifice to benefit the organization or group (Baumeister & Leary, 1995; Brewer & Gardner, 1996; Dawes, van de Kragt, & Orbell, 1990). Ultimately, identification with the group should boost social trust (Boix & Posner, 1998; Hooghe, 2003) as people realize their interdependence with one another since

social trust seems to be enhanced by a sense that “we’re all in this together” (Phan, 2008, p. 23).

Schools are settings where young people can learn what it means to be part of a community, where they can develop a collective identity and appreciate how their interests are likely to be realized in the interests of the whole. Reports of student solidarity and feelings of connectedness at school are positively correlated with high-school students’ civic commitments in five different nations (Flanagan, Bowes, Jonsson, Csapo, & Sheblanova, 1998) and predict civic engagement in early adulthood for American youth (Duke, Skay, Pettingell, & Borowsky, 2009; Smith, 1999). Thus, students’ sense of solidarity at school should boost social trust because it increases youths’ realization of their interdependence with fellow human beings.

Democratic Climate: Teacher-Student Relationships

Open classroom climates in which teachers value students’ opinions and encourage a respectful exchange of autonomous views are positively related to such democratic skills in students as tolerance, perspective taking, and trust (Hahn, 1998; Torney-Purta, Lehmann, Oswald, & Schulz, 2001) as well as to their civic commitments and beliefs that America is a just and fair society (Flanagan, Cumsille, Gill, & Gallay, 2007). We contend that, when teachers create a civil climate for learning and an open exchange of opinions in their classrooms, they are teaching students about the phenomenon of trust. Likely, there are two processes at work. First, by engaging students in open discussions, teachers relinquish their privileged position as the sole authority in the classroom and accept a certain amount of vulnerability as a potential cost for having faith in their students (Meier, 2002; Tschannen-Moran & Hoy, 2000). Trust is not based on control but on freedom. When teachers respect students’ autonomous opinions and allow them to challenge others’ (including the teacher’s) points of view, they convey their belief that students are trustworthy. According to longitudinal work, adolescents’ perceptions that their teachers and parents respect their autonomy and treat them fairly has a positive effect on their social trust later in adulthood (Damico, et al., 2000; Uslaner, 2002).

Second, in creating an open climate for exchange of views, teachers express their expectation that students treat one another with respect. In so doing, they set standards for how members of a Civil Society should treat one another. In such learning contexts, students should come to appreciate the reciprocal relationship between trust and trustworthiness (Deutsch, 1958; Erikson, 1950), i.e., “the teacher has placed his/her faith in us and we should live up to those expectations by respecting our fellow students”. Social trust is positively related to a sense of shared norms and a feeling of being part of the same ‘moral community’ (Uslaner, 2002). Thus, we contend that, by creating an open classroom climate for learning and a respectful exchange of views, teachers enable students to appreciate that they are part of the same moral community, a realization that should augment their social trust.

The transition to middle school

There is a sizable literature documenting that the transition to middle school is associated with decrements in early adolescents’ self confidence and feelings of belonging and with increases in their self consciousness, sensitivity to others’ assessments, and anxieties about being accepted (L. H. Anderman, 1999; Wigfield, Eccles, MacIver, Reuman, & Midgley, 1991). Not only does this transition dislodge peer bonds for many adolescents but important changes in teacher-student relations and in instructional practices also occur including more competition and social comparison (L.H. Anderman & Anderman, 1999; Roeser, Midgley, & Urdan, 1996); and greater teacher control and less student autonomy (Midgley,

Feldlaufer, & Eccles, 1989). According to research with adults, social trust is positively associated with optimism, cooperation, and self-confidence, and negatively with competition (Rosenberg, 1956; Uslaner, 2002). Experiences that engender insecurity erode social trust (Welch, Rivera, Conway, Yonkoski, Lupton, & Giancola, 2005). Given the dislodging of social connectedness, lower autonomy, and decreased sense of security associated with the transition to middle-school, we expect that this transition will cause decrements in social trust.

Conceptual Model

Figure 1 shows the conceptual model of adolescent social trust. For adolescents in general we had three hypotheses regarding social trust. First, we expected that social trust at time one would be positively related to social trust at time two. Second, we predicted that adolescents' views of their school climates, measured as their perceptions of democratic climates and school solidarity, would increase their levels of social trust from T1 to T2. Third, we predicted that making a transition to a new school would decrease social trust. Note that, with the exception of the effects of social trust at T1 on social trust at T2, the school climate effects are based on T2 measures since we are testing their potential boost to social trust at T2, with social trust at T1 controlled. However, since Uslaner (2002) has pointed out that the disposition to trust others is correlated with an optimistic outlook, we thought it was important to also control for a "rose colored glasses" bias. We did this by adding T1 measures of school solidarity which we felt tapped a generally positive view of a group, i.e., the student body. As outlined in Figure 1, we expected that solidarity at T1 would have a positive indirect effect on social trust T2 through its effects on solidarity at T2. We did not include the T1 measure of democratic climate because we did not consider this construct a good control for the optimistic bias. This construct taps specific teaching practices which we hypothesize will have a contemporaneous impact on social trust.

We also tested whether the process conceptualized in Figure 1 operated differently for our three adolescent age groups. As already noted, we had three developmental hypotheses: First, we expected older adolescents to have lower social trust than younger adolescents. Second, we expected that social trust would be more stable for older when compared to younger adolescents. In other words, T1 levels of social trust would have a stronger impact on T2 levels of social trust for older adolescents than for younger adolescents. Third, we expected that interpersonal trust with friends would significantly predict social trust in early adolescence but would be distinguished from social trust by late adolescence. Finally, we expected to see a more pronounced negative effect of school transition on social trust for the early adolescents who made a transition to middle school, than for the middle and late adolescents who made a transition to high school.

Method

Sample and Procedure

The data used in this study come from the Social Responsibility and Prevention Project (SRPP), a longitudinal study following early-, middle-, and late-adolescents over three years. During the first year, project staff recruited fifth through twelfth graders from classes in eight school districts from two northeastern states. Surveys were administered in classrooms in the spring of each year for three years from 2001 to 2004. The social trust indicators for this study were asked at Waves 2 and 3 and thus we restrict our analyses to these two waves. To simplify the presentation of results, we refer to these as Time 1 (T1) and Time 2 (T2) in the tables and results. In total, 1,535 students completed valid surveys for waves two and three.

The ethnic background of the participants was 77% European-American, 9% African-American, 4% Latino-American, and 6% from other ethnic backgrounds (these included respondents who classified themselves as Native-American, Asian-American, or Other). Fifty-four percent of the participants were female. Overall, these data represent a good reflection of the student populations in the school districts.

To test our hypotheses regarding the development of social trust during the adolescent years, we examined data for three separate adolescent groups based on respondents' self-reported ages. Each group was created so that its members would correspond to one of three phases of adolescence. For the first group, labeled *early adolescent* (N = 562), membership was limited to those who were 12 or 13 years old at wave 3 of the study. Some of these students made the transition from elementary to middle school at wave 3; others had not yet made that transition, but would the following year. For the second group, *middle adolescent* (N = 506), membership was limited to those who were 14 or 15 years old at wave 3 of the study. Some of these students had made the transition to high school at wave 3; others were still in middle school at this wave. The third group, *late adolescent* (N = 467), was limited to those who were 16, 17, or 18 at wave 3 of the study. A small percentage of this age group made the transition to high school in wave 3 since one school district divided students into lower and upper high school.

Missing Data and Sample Attrition—Missing data were rare for the variables used to create the latent constructs for this analysis. For the construct items, the percent of cases classified as missing ranged from 1.1% to 2.7%. Rather than use listwise deletion of cases with missing data, we analyzed the data using full information maximum likelihood estimation (Eliason, 1993). Full information maximum likelihood estimation provides better estimates of population parameters than listwise deletion when the data are assumed to be missing at random (Allison, 2003). There was a rate of attrition between waves two and three of about 20%. This was due primarily to students graduating high-school after wave two. In addition, some students moved out of the study schools and others were absent on the days of survey administration.

Measures

Social trust was a latent variable that measured adolescents' positive views of humanity. The construct consisted of two observed indicators: (a) "In general, most people can be trusted;" and (b) "Most people are fair and don't take advantage of you." Possible responses ranged from (1) = "strongly disagree" to (5) = "strongly agree." These classic items have been used for more than thirty years in national surveys such as the General Social Survey (GSS) of adults and the Monitoring the Future (MTF) studies of high-school seniors.

Interpersonal trust was a latent variable measuring adolescents' feelings about the levels of trust in their relationships with their closest friends and peers. Responses to the following statements were used to create the interpersonal trust variable: (a) "I have friends that I can trust to keep a secret;" (b) "I have friends that I can trust to keep their promises;" and (c) "I stick up for my friends when somebody says something mean about them." Responses ranged from (1) = "strongly disagree" to (5) = "strongly agree."

School solidarity was a latent variable measuring adolescents' perceptions that a sense of mutual pride and solidarity characterized the student body at their school. The items used to measure this variable consisted of adolescent responses to the following statements: (a) "Students have a lot of school spirit;" (b) "Everyone tries to keep the school looking good;" (c) "Most students take pride in our school;" (d) "Students feel like they are an important part of the school;" and (e) "Most students seem to care about each other, even people they

don't know well." Responses ranged from (1) = "strongly disagree" to (5) = "strongly agree." Like others, our measure taps students' perceptions that the climate is one in which students feel a common spirit and sense of identification with fellow students and with the institution (Coker & Borders, 2001; Goodenow, 1993; Voekl, 1996).

Democratic climate was a latent variable measuring the degree to which adolescents felt that their teachers encouraged a climate of mutual respect in which students were encouraged to exchange different points of view. There were three items used to measure this variable. These included: (a) "Students have an opportunity to debate and discuss issues;" (b) "Students can disagree with teachers as long as they are respectful;" and (c) "Students are encouraged to voice their opinions, even if they are different from what most people think." Responses ranged from (1) = "strongly disagree" to (5) = "strongly agree." These are typical items used in studies to tap an open classroom climate (Torney-Purta, Schwille, & Amadeo, 1999).

School Transition was a dichotomous variable coded as one if the respondent transitioned to a new school between waves two and three, and coded as zero if they remained in the same school. Thirty four percent of the entire sample experienced a transition between waves two and three of the study (48% of early, 35% of middle, and 16% of late adolescents).

Control Variables

Gender was coded (1) = "female" and (0) = "male." Race-ethnicity was measured as a set of dummy variables that included *Black*, *Hispanic*, and *Other*, with *White* serving as the reference category. Student socioeconomic status was measured using the mean of the respondent's reports of his/her *parents' education*. When data were available for both parents, it was the average number of years of education. If data were only available for one parent, it was the years of education for that parent. *Prior social trust* and *prior school solidarity* were also controlled for, and were latent variables created using wave 2 indicators identical to those used in the creation of the wave 3 variables. Throughout the results section, the terms "prior social trust" and "social trust at time 1 (T1)" are used interchangeably, as are "prior school solidarity" and "school solidarity at time 1 (T1)". Measures of social trust and school solidarity at T1 and T2 are included in each of the analyses. For all other variables, only measures at T2 are used.

Table 1 displays means, standard deviations, and sample sizes for the items used to create the latent variables for social trust, the two school climate variables, and interpersonal trust. The table also reports the proportion of respondents who made a transition to a new school between waves 2 and 3, and information about the control variables. Statistics are provided for the overall sample, and for the three adolescent age groups. The overall sample was restricted to participants in waves 2 and 3 of the study. This restriction was necessary for two reasons. First, the items used to create the social trust variable were not available at wave 1. Second, we were using adolescent social trust at time 1 (measured at Wave 2 in our 3-wave study) as a control variable in the models reported below, so we needed to exclude anyone from the analysis who did not participate in both waves.

Table 2 reports means, standard deviations, and Cronbach's alpha values for the conceptual variables. Statistics are provided for the overall sample, and for the three adolescent age groups. The conceptual variables were created using the means of the underlying items for each construct. The constructs had a range of possible values from one to five, where a score of one corresponded to the lowest mean levels of agreement across items, and a score of five corresponded with the highest mean levels of agreement across items. For the overall sample, adolescents, on average, had moderate levels of social trust (Means ranging from 2.97 to 3.27 on a 5-point scale). On average, social trust declined from T1 to T2, although

the decline was not statistically significant. Compared to social trust, interpersonal trust was relatively high (Means ranging from 4.11 to 4.17). In addition, students' reports of democratic school climates were positive and these reports did not vary significantly across groups. Overall, there were moderate feelings of school solidarity, and these reports were highest for early adolescents, lower for middle adolescents, and lowest for late adolescents.

Analytic Strategy

The data analysis involved three steps. In the first step we performed a confirmatory factor analysis (CFA), using the statistical software package *Mplus* (Muthén & Muthén 2005), in order to show that our measurement model was an appropriate fit for the overall sample. Each of the latent constructs representing the conceptual variables for social trust, democratic climate, school solidarity, and interpersonal trust, were simultaneously estimated in the measurement model. In the second step, we divided the sample into three groups of adolescents, based on their reported age at wave three, and estimated a multiple group measurement model. This allowed us to determine whether the items we used to measure our latent constructs for the overall sample adequately measured the underlying conceptual variables for each of the three adolescent age groups. Third, we estimated a multiple group structural equation model (SEM) in order to determine whether the relationships between social trust and perceptions of school climates differ across age groups. In this model social trust T2 was regressed on democratic climate, school solidarity T1 and T2, interpersonal trust, transition, parents' education, gender and social trust T1. In addition, solidarity T2 was regressed on solidarity T1. This set of analyses is analogous to estimating interaction effects between the three stages of adolescence and the other independent variables.

Multiple Group Models

Before presenting the results of the analysis, a brief explanation of the steps involved in the multiple group analysis is in order. The estimation of group differences involved four major steps. First, we performed a multiple group confirmatory factor analysis (CFA). Here, the social trust, interpersonal trust, and school climate latent constructs were tested for factor invariance across groups. In other words, it was determined whether the factor loadings of the observed social trust and school climate items on the latent democratic climate, school solidarity, interpersonal trust, and social trust variables could statistically be considered equivalent across age groups. To test for factor invariance we estimated an unconstrained model for each group comparison in which the factor loadings were freely estimated for each group. Next, the factor loadings were constrained to be equal across groups. A chi square difference test of the unconstrained and constrained models indicated that in all cases the factor loadings could be considered invariant across the three groups, indicating that the measurement model presented for the full sample effectively applies to the three groups of adolescents examined here.

Next, we estimated a series of multiple group SEMs. This involved three steps. In the first step, an unconstrained model was estimated in which the effects of the independent variables on the outcome variables (the path coefficients) were free to vary across age groups. In the second step, the effects of the independent variables on the outcome variables were constrained to be equal between the groups. A chi-square difference test, where the chi-square value of the unconstrained model is subtracted from the constrained model, reveals whether the unconstrained model is a significantly worse fit to the data than the constrained model. A significant chi-square value for the difference test indicates that the unconstrained model does not fit the data as well as the constrained model, thus revealing the presence of an interaction between our age groups and a given independent variable.

The chi-square differences in the preceding set of analyses are equivalent to an omnibus test that indicates whether at least one path from an independent variable to an outcome was significantly different between groups. Locating the specific independent variable(s) that produced significantly different coefficients required a third step. In this step, the effects of the independent variables on the outcomes were constrained to be equal, one at a time, across groups. A significant chi-square difference between the unconstrained and constrained models indicated whether a particular path coefficient was significantly differently related to the outcome between the groups. Basically, this test indicates whether the effects of the independent variables on the dependent variables are significantly different among our age groups and, subsequently, whether they should be allowed to vary across groups.

Results

Full Sample Measurement Model

We assessed model fit for the full sample measurement model using chi-square significance tests. Significant chi-square values generally indicate poor model fit. However, chi-square values are highly sensitive to increases in sample size, and it is not uncommon to observe significant values with large sample sizes. As a result, we also assessed model fit through the use of two indices that are not influenced by sample size, the Comparative Fit Index (CFI) and the Root Mean Square Error of Approximation (RMSEA). A CFI of .90 or greater (Bentler, 1990) and an RMSEA of .08 or less (Browne & Cudeck, 1993) indicate that the model adequately fits the data. Based on these standards, our full sample measurement model fits the data well (CFI = .97, RMSEA = .04).

Table 3 reports the factor loadings for the full sample measurement model. The standardized factor loadings ranged from .57 to .90, and all of the latent constructs had at least one factor that loaded at .69 or greater. Higher factor loadings represent better measurement, thus the closer the factor loadings are to 1.0, the more likely it is that the individual items are measuring an underlying latent construct. In this case, each of the factor loadings are relatively high, therefore it is likely that the combination of our individual items tapped our underlying conceptual variables.

Measurement Model for Three Age Groups

For our multiple group measurement model, we conducted chi-square difference tests between a model where the factor loadings were freely estimated and a model where the factor loadings were constrained to be equal, and determined that there was factor invariance for the item loadings across groups. The tests for factor invariance required several steps. First, we estimated a model where the factor loadings were freely estimated across groups ($\chi^2 = 968.66$, $df = 472$). Next, we estimated a series of models where we incrementally constrained each factor loading to be equal across groups and performed chi-square difference tests between the increasingly constrained models and the fully unconstrained model. The results of the chi-square difference tests suggested that a model with all factor loadings constrained to be equal across groups (Model 4) adequately fit the data ($\chi^2 = 1003.38$, $df = 500$). Non-significant chi-square differences between the fully unconstrained model and the fully constrained model provide evidence of invariance. The chi-square difference (34.72, $df = 28$) between our unconstrained and constrained models was not significant at $p < .05$, indicating that the factors tap similar latent constructs across age groups.

Table 4 reports the unstandardized and standardized factor loadings for the multiple group measurement model for the latent variables: social trust (T1 and T2), democratic climate,

school solidarity (T1 and T2), and interpersonal trust. As was the case with the full sample measurement model, factor loadings are relatively high for each of the three adolescent groups. This suggests that the items we used to measure our conceptual variables are effectively measuring our latent constructs. In addition, comparisons of the standardized factor loadings within groups indicates that the individual items measure their underlying constructs according to the same ranking of importance for all three of the age groups, thus providing evidence that these items tap the same latent variables across the three adolescent age groups.

Social Trust Across Age Groups

Table 5 reports the bivariate correlations of the latent constructs for the three adolescent age groups and reveals some important differences in the relationships. For example, social trust T1 is more strongly correlated with social trust T2 for late adolescents than for early and middle adolescents, suggesting, as predicted, that these beliefs about humanity are more stable by late adolescence. In addition, while social trust and interpersonal trust are positively correlated for early adolescents, the relationship increasingly weakens from middle to late adolescence. These results suggest that, as adolescents mature, they are better able to distinguish trust in friendships from trust in the generalized other.

There are also differences between groups in the strength of the relationship between social trust and perceptions of democratic school climates. The correlation between these two weakens across the three age groups (T2 correlations of .55, .42, and .39 for early, middle, and late adolescents respectively). School solidarity T2 had a stronger correlation with social trust T2 across groups than democratic climate did. The relationship was strongest for early adolescents (.70), and was somewhat weaker for middle (.58) and late adolescents (.59). In addition, the bivariate correlation between school solidarity at T1 and social trust at T2 was strongest for late adolescents (.41) who, by and large, remained in the same school when compared to the correlations for early (.29) or middle (.24) adolescents.

Multiple Group SEM

For the multiple group SEM, we tested for interactions across the three age groups by first estimating a multiple group model where all of the path coefficients were freely estimated across groups ($X^2 = 1159.49$, $df = 560$). Next, the effects of the independent variables on the outcome variables were constrained, one at a time, to be equal between the groups. A series of chi-square difference tests, where the chi-square value of the unconstrained model was subtracted from the constrained model, revealed whether the unconstrained model is a significantly worse fit to the data than the constrained model. The result was our final model, where the path coefficients for social trust T2 on school solidarity T2 and school solidarity T2 on school solidarity T1 were constrained to be equal across groups ($X^2 = 1196.57$, $df = 578$). The chi-square difference tests showed that constraining these paths to be equal resulted in a significantly worse fitting model than if we were to let them vary ($X^2 = 37.08$, $df = 18$, $p < .01$).

Table 6 displays the standardized and unstandardized path coefficients for the multiple group SEM, as well as the direct, indirect, and total effects of democratic climate and solidarity T1, and R-square values for the dependent variables. In this model social trust T2 was regressed on social trust T1, school climate, interpersonal trust, and school transition on for each age group. In addition, solidarity T2 was regressed on democratic climate, and social trust T1 was regressed on solidarity T1. School solidarity T2 was regressed on democratic climate because earlier iterations of the analysis suggested that school solidarity T2 had an intervening effect on the relationship between democratic climate and social trust T2. Gender, race, and parents' education were also regressed on social trust as controls.

Inclusion of the control variables did not substantively change the relationships between the variables of interest. Therefore, the more parsimonious model is presented in the analysis below.

For multiple group models, the unstandardized coefficients allow comparisons to be made across groups, while the standardized coefficients report the magnitude of the effects within groups. The regression coefficients for social trust T2 on perceptions of solidarity (T2 and T1), and for school solidarity T2 on solidarity T1 were constrained to be equal across age groups. Chi-square difference testing revealed that these coefficients were not significantly different across age groups. Thus, these results suggest that the effect of school solidarity on social trust is the same for all adolescents.

Social Trust Across Age Groups

The *unstandardized coefficients* reveal differences across adolescent age groups. Although social trust at T1 positively predicted social trust at T2 across age groups, the effect was most pronounced for the late adolescents, pointing to the increasing stability of these beliefs with age. There was a positive, weak relationship between democratic climate and social trust for early adolescents but no effect for middle or late adolescents. There was a significant, positive effect of interpersonal trust on social trust for early adolescents, a weaker association for middle adolescents, and no association for late adolescents. Contrary to our prediction, the transition to a new school did not predict significant declines in social trust for any age group.

Indirect Effects Across Age Groups

As with the model for the full sample, we also examined the *indirect effects* of perceptions of democratic climate on social trust T2, and of school solidarity T1 on social trust T2. We tested whether perceptions of a democratic climate had a significant effect on social trust through perceptions of solidarity, all measured at T2. We found significant indirect effects of democratic climate for all age groups, though these effects appear to be somewhat stronger for early adolescents than for middle and late adolescents. That is, reports of democratic school climates affect higher perceptions of solidarity, which increase levels of social trust, and this effect is strongest for early adolescents. This may suggest that younger adolescents are less likely than older adolescents to distinguish between these discrete dimensions of school climate. This is plausible, especially given the fact that early adolescents' reports of democratic climates were correlated .72 with their reports of school solidarity whereas the reports of middle- and late-adolescents were correlated at .54. An alternative explanation, consistent with theories of person-environment fit (Eccles et al., 1993; Eccles, 2004) is that early adolescents are particularly attuned to the opportunities for self determination that their schools provide and that such opportunities color their views of fellow students and, ultimately of people in general. As expected, we also found that students' reports of solidarity at T1 impacted their social trust at T2 indirectly through their perceptions of solidarity at T2, as well as through their social trust at T1. These hypotheses were supported for all age groups. Finally, the (unpredicted) negative effect of solidarity at T1 on social trust held up for all age groups.

Discussion

The results of this study point to some of the developmental underpinnings of social trust and the factors associated with adolescents' lay theories about humanity (Dweck, 1999; Erdley & Dweck, 1993; Levy & Dweck, 1999). First, over the course of adolescence, there appears to be an increasing differentiation of the social category of the generalized other from one's personal friendships and an increasing hardening of beliefs about whether people

are trustworthy. The bivariate correlation between interpersonal and social trust was strongest for early adolescents (.41), weaker in middle (.26) and weakest in late adolescence (.13). Second, the increasing stability of one's trust in humanity is supported by the fact that the bivariate correlation between social trust measured at T1 and T2 was stronger for late- when compared to early- or middle-adolescents and, in the SEMs, late adolescents' reports of social trust at T1 were the strongest predictor of their social trust at T2 whereas school solidarity was the strongest predictor for early- and middle-adolescents.

The results also indicate that, whereas levels of social trust (and of student solidarity) decline with age (with late adolescents least likely to endorse either), levels of interpersonal trust do not. Item analyses in the cross sectional data in each year provide the strongest support for an inverse relationship between age and social trust with the difference between early and middle adolescents most pronounced. The one year longitudinal data confirm these relationships: For each age group, the belief that people are trustworthy and fair declined between T1 and T2. At the same time, regardless of age or time of measurement, levels of interpersonal trust were higher than levels of social trust and there were no age related differences in reports of trustworthy friendships.

Finally, our study points to the role that school climates, especially perceptions of school solidarity can play in boosting social trust. Controlling for levels of social trust at T1, adolescents' reports that students at their school felt a sense of group solidarity and pride of membership in the institution predicted significant increases in social trust for all age groups. One might dismiss this result as merely reflecting a "rose colored glasses" phenomenon, i.e., youth who see the best in their fellow students also see the best in humanity. As Uslaner (2002) has argued about adults, those with high levels of social trust tend to be optimists, viewing the world with a rosy glow. However, the fact that our models included both adolescents' reports of social trust and of school solidarity at Time 1 should provide a stringent test for the "rose-colored glasses" phenomenon. With those variables in the model, reports of school solidarity at Time 2 predicted a significant boost in T2 social trust for all three age groups. Thus, we conclude that adolescents' social trust is shaped by feelings of belonging, of having a sense of collective identity at school. The fact that such feelings had a positive impact on their perceptions that people in general are fair and trustworthy is consistent with psychological research showing that, when the human need to belong is satisfied, it has a positive impact on our perceptions of others (Baumeister & Leary, 1995). It is noteworthy that this result differs from the more equivocal results in the literature on adults where there is mixed evidence that being in organizations with others boosts social trust. However, those studies typically measure only membership in the organization rather than one's sense of solidarity with others in the organization.

Despite the significant and positive contemporaneous effect of solidarity on social trust and the positive indirect effect of solidarity (T1) on social trust (T2) through its effect on solidarity (T2), there was a significant negative direct effect of solidarity (T1) on social trust at T2 for all three age groups. We had not predicted this and can only offer a post hoc explanation. First we note that the bivariate relationships between solidarity (T1) and social trust (T2) were positive for all age groups, although more moderate for the early and middle adolescents compared to the late adolescents (who were the least likely to change schools). The negative effects of school solidarity on social trust were found in the SEMs which controlled for the positive direct effects of solidarity measured at the same time as trust and positive indirect effects measured in the prior year and no doubt we are faced with an issue of multicollinearity. Our explanation for this effect draws from Portes' (1998) observation that sometimes strong bonds of trust and loyalty within a group can be maintained at the expense of others "on the outside." In part, our school solidarity construct may be picking up

on the bonding with similar others that students felt as part of the student body, a cohesiveness that did not bridge to a wider network of 'others.'

Reports of a democratic climate at school affected social trust indirectly through reports of student solidarity. In other words, when youth felt that teachers at their school respected students' autonomous opinions and encouraged a respectful exchange of views, it increased their sense of school solidarity which in turn led to higher social trust. We suggest two interpretations of this result. The first concerns the role of adult authorities in treating youth as trustworthy agents deserving of fairness and respect (Meier, 2002). This interpretation is consistent with longitudinal work showing that levels of social trust are higher among adults who, as youth, reported that their parents and teachers respected their autonomy (Damico, et al., 2000; Uslaner, 2002). A second interpretation concerns the role of discussions in building group identities and understanding. Teaching practices that encourage a respectful exchange of views may build feelings of collective identity and solidarity which, in turn, enhance youth's trust in people. In this regard, work by Orbell, van de Kragt, and Dawes (1988) using the prisoner's dilemma game is relevant. They found that when the game was preceded by a period of discussion, group identities formed, competition and rivalry decreased, and cooperation increased.

Although the effect of transitioning to middle school on the early adolescents' social trust was negative, it was non significant. Our hypothesis of a decline in social trust associated with this transition was based on literature pointing to declining self-esteem and increasing anxiety associated with this transition (Wigfield, et al., 1991). This work attributes such negative transition effects to the more competitive and individualistic environment of middle-school when compared to elementary school and the sense of being on one's own rather than part of a community. Our measure of solidarity reflects the opposite of this feeling of being on one's own and we note that it was only early adolescents who reported declines in solidarity between T1 and T2. Because solidarity had such strong effects on social trust and because solidarity did decline for the early adolescents, we expect that this captured the effects of the middle school transition.

Our findings of a relationship between school climate and social trust are consistent with a large body of work linking students' sense of belonging at school to their academic motivation, engagement, and achievement (Osterman, 2000). In the literature on intrinsic motivation in school, the combination of belonging/relatedness with support for autonomy is considered a winning combination for student learning (Deci et al., 1991). The results of our study suggest that this combination of self determination and solidarity also might play an important role in building the stock of social trust that undergirds a democratic society.

There were several limitations of the study that deserve mention. First, the results were based on self reports and tap subjective perceptions of contextual variables such as school solidarity. A nested design would have provided a better test of our claims but we did not have an adequate number of schools to use multi-level modeling techniques. Second, we used only two items in our structural equation models to measure the latent construct, social trust. These classic items have been used for decades in research with adults and with high school seniors and our confirmatory factor analysis indicated that the constructs were equivalent across adolescent age groups. However, including more items may have given us more purchase on this latent construct. Third, because the study is based on only two waves of longitudinal data, it is somewhat limited in its ability to address the causal nature of the relationships between the variables of interest. If we had used more than two waves of longitudinal data it would have strengthened our ability to more effectively address the issue of causality. Finally, surveys were the only source of data in this study. If we had complemented the survey data with targeted interviews or focus groups, we would have a

better sense of what phrases such as “most people” or “people in general” connote to different age groups of adolescents.

For democratic societies to function certain psychological dispositions have to be nurtured in the citizenry and social trust is critical (Sullivan & Transue, 1999). Longitudinal research following one national cohort of high-school graduates into the fourth decade of life suggests that, while our beliefs about whether humanity is trustworthy and fair are somewhat malleable, by and large these beliefs crystallize in adulthood (Stolle & Hooghe, 2004). To understand the foundation of these beliefs about humanity we need more research on formative influences in childhood and adolescence (Uslaner, 2002). The current study was an attempt to address this gap. The results point to developmental changes in social trust between early and late adolescence and to the importance of school climates in shaping such faith in humanity.

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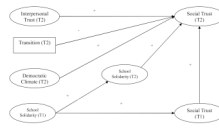


Figure 1.

Table 1

Statistics of Variables for Full Sample and Three Adolescent Groups

Variables	Full Sample (N = 1492)		Early Adolescent (N = 540)		Mid- Adolescent (N = 491)		Late Adolescent (N = 461)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
<u>Social Trust (T2)</u>								
People can be trusted	3.06	1.01	3.17	1.03	3.03	1.00	2.96	.98
People are fair	3.10	.94	3.24	.99	3.07	.94	2.98	.85
<u>Social Trust (T1)</u>								
People can be trusted	3.12	1.05	3.22	1.09	3.08	1.01	3.03	1.03
People are fair	3.17	1.00	3.32	1.05	3.13	.99	3.03	.94
<u>Interpersonal Trust (T2)</u>								
Trust to keep secret	4.08	.92	4.07	.98	4.02	.91	4.14	.86
Trust to keep promise	4.07	.87	4.06	.91	4.04	.88	4.12	.82
Stick up for friends	4.27	.77	4.30	.80	4.26	.80	4.25	.70
<u>Democratic Climate (T2)</u>								
Students opportunity to debate/discuss	3.43	1.01	3.33	1.07	3.46	.97	3.53	.97
Students can disagree	3.48	1.11	3.47	1.14	3.48	1.13	3.50	.99
Students encouraged to express opinions	3.45	.92	3.46	.99	3.47	.91	3.41	.85
<u>School solidarity (T2)</u>								
Keep school looking good	2.77	.99	2.97	1.03	2.70	.97	2.60	.95
Take pride in school	3.10	1.03	3.28	1.04	3.08	1.03	2.91	.98
School spirit	3.23	1.11	3.32	1.18	3.21	1.08	3.12	1.05
Important part of school	3.07	.95	3.16	.98	3.08	.94	2.95	.92
Care about each other	2.85	1.02	2.9	1.02	2.90	1.02	2.73	1.01
<u>School solidarity (T1)</u>								
Keep school looking good	2.82	1.35	3.24	1.12	2.66	1.10	2.51	1.03
Take pride in school	3.11	1.12	3.39	1.12	3.02	1.12	2.87	1.06
School spirit	3.15	1.15	3.29	1.14	3.11	1.16	3.04	1.15
Important part of school	3.11	1.10	3.43	1.11	2.96	1.09	2.88	1.00

Variables	Full Sample (N = 1492)		Early Adolescent (N = 540)		Mid- Adolescent (N = 491)		Late Adolescent (N = 461)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Care about each other	2.84	1.07	3.06	1.04	2.70	1.08	2.72	1.03
Transition	.34	--	.48	--	.35	--	.16	--
<u>Demographic</u>								
Age	14.55	1.72	12.74	.44	14.60	.49	16.69	.84
Female	.54	--	.55	--	.55	--	.53	--
White	.77	--	.74	--	.75	--	.84	--
Black	.09	--	.07	--	.12	--	.07	--
Hispanic	.04	--	.04	--	.04	--	.04	--
Other	.06	--	.08	--	.05	--	.05	--
Parent's education (years)	14.19	2.23	14.21	2.28	14.11	2.23	14.24	2.18

Note: SD = Standard deviation. Standard deviation not shown for proportions.

Table 3

Unstandardized and Standardized Factor Loadings for Latent Constructs for the Full Sample

	Un- standardized Loading	Standardized Loading
<u>Trust (T1)</u>		
People can be trusted ^a	1.00	0.69
People are fair	0.93	0.67
<u>Trust (T2)</u>		
People can be trusted ^a	1.00	0.76
People are fair	0.89	0.72
<u>Interpersonal trust</u>		
Trust to keep secret ^a	1.00	0.87
Trust to keep promise	0.99	0.90
Stick up for friends	0.55	0.57
<u>Democratic Climate</u>		
Debate issues ^a	1.00	0.67
Respectfully disagree	0.96	0.58
Respect different opinions	1.01	0.74
<u>School solidarity (T1)</u>		
School looking good ^a	1.00	0.74
Take pride in school	1.13	0.84
School spirit	0.87	0.64
Students important	0.92	0.70
Students care	0.89	0.70
<u>School solidarity (t2)</u>		
School looking good ^a	1.00	0.75
Take pride in school	1.14	0.83
School spirit	0.98	0.66
Students important	0.98	0.77
Students care	0.89	0.65

$\chi^2(df) = 453.84 (148); p < .001; CFI = .97; RMSEA = .04.$

^aFactor loading fixed to one as reference point.

Table 4

Unstandardized and Standardized Factor Loadings for Latent Constructs for Three Adolescent Groups

	Un- standardized Loading ^a	Standardized Loading Early	Standardized Loading Middle	Standardized Loading Late
<u>Trust (T1)</u>				
People can be trusted ^b	1.00	0.65	0.70	0.71
People are fair	0.94	0.62	0.68	0.72
<u>Trust (T2)</u>				
People can be trusted ^b	1.00	0.76	0.75	0.76
People are fair	0.88	0.71	0.71	0.73
<u>Interpersonal trust</u>				
Trust to keep secret ^b	1.00	0.84	0.88	0.88
Trust to keep promise	0.99	0.90	0.90	0.91
Stick up for friends	0.55	0.58	0.55	0.57
<u>Democratic Climate</u>				
Debate issues ^b	1.00	0.68	0.70	0.64
Respectfully disagree	0.94	0.57	0.59	0.60
Respect different opinions	0.98	0.73	0.74	0.71
<u>School solidarity (T1)</u>				
School looking good ^b	1.00	0.72	0.74	0.74
Take pride in school	1.12	0.82	0.83	0.83
School spirit	0.86	0.63	0.61	0.60
Students important	0.91	0.67	0.70	0.72
Students care	0.88	0.70	0.67	0.69
<u>School solidarity (T2)</u>				
School looking good ^b	1.00	0.74	0.72	0.77
Take pride in school	1.13	0.84	0.79	0.84
School spirit	0.97	0.66	0.64	0.66
Students important	0.98	0.77	0.74	0.77
Students care	0.89	0.66	0.60	0.68

$\chi^2(df) = 643.06 (200); p < .001; CFI = .96; RMSEA = .04.$

^aFactor loadings constrained to be equal across groups.

^bFactor loading fixed to one as reference point.

Table 5

Multiple Group Correlations

	Early					
	(1)	(2)	(3)	(4)	(5)	(6)
(1) Social Trust T1	1.00	.49***	.29***	.42***	.68***	.44***
(2) Social Trust T2		1.00	.41***	.55***	.29***	.70***
(3) Interpersonal Trust T2			1.00	.37***	.25***	.37***
(4) Democratic Climate T2				1.00	.34***	.72***
(5) School solidarity T1					1.00	.42***
(6) School solidarity T2						1.00
middle						
	(1)	(2)	(3)	(4)	(5)	(6)
(1) Social Trust T1	1.00	.49***	.19**	.25***	.55***	.39***
(2) Social Trust T2		1.00	.26***	.42***	.24***	.58***
(3) Interpersonal Trust T2			1.00	.33***	.26***	.24**
(4) Democratic Climate T2				1.00	.31***	.54***
(5) School solidarity T1					1.00	.46***
(6) School solidarity T2						1.00
late						
	(1)	(2)	(3)	(4)	(5)	(6)
(1) Social Trust T1	1.00	.63***	-.03	.20**	.60***	.37***
(2) Social Trust T2		1.00	.13*	.39***	.41***	.59***
(3) Interpersonal Trust T2			1.00	.23***	.02	.11*
(4) Democratic Climate T2				1.00	.41***	.54***
(5) School solidarity T1					1.00	.51***
(6) School solidarity T2						1.00

*** p < .001;

**
p < .01;
*
p < .05.

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Table 6

understandized and standardized SEM Coefficients for multiple Group Model^a

Path	Early Adolescent (N = 562)		Middle Adolescent (N = 506)		Late Adolescent (N = 467)	
	Unstandardized Coefficient (SE)	Standardized Coefficient	Unstandardized Coefficient (SE)	Standardized Coefficient	Unstandardized Coefficient (SE)	Standardized Coefficient
(a) Trust (T1)→Trust (T2)	.48*** (.13)	.45	.46*** (.10)	.44	.57*** (.09)	.57
(b) Interpersonal Trust→Trust (T2)	.17*** (.05)	.19	.10* (.05)	.11	.07 (.05)	.08
(c) Transition→Trust (T2)	-.10 (.07)	-.06	-.04 (.07)	-.02	.03 (.09)	.01
(d) Democratic Climate (T2)→Trust (T2)	.16* (.07)	.15	.14 (.07)	.13	.05 (.08)	.04
(e) School solidarity (T2)→Trust (T2)	.51*** (.05)	.53	.51*** (.05)	.48	.51*** (.05)	.51
(f) School Solidarity(T1)→Trust (T2)	-.29*** (.05)	-.33	-.29*** (.05)	-.31	-.29*** (.05)	-.31
<hr/>						
(f) Democratic Climate→School solidarity (T2)	.67*** (.06)	.62	.46*** (.06)	.45	.52*** (.07)	.45
(g) School Solidarity(T1)→School Solidarity(T2)	.26*** (.03)	.27	.26*** (.03)	.30	.26*** (.03)	.29
(h) School solidarity (T1)→Trust (T1)	.59*** (.05)	.70	.48*** (.05)	.56	.55*** (.06)	.61
Indirect and Total Effects	Indirect Effect	Total Effect	Indirect Effect	Total Effect	Indirect Effect	Total Effect
Democratic Climate→ School solidarity (T2)→ Trust(T2)	.33***	.48***	.22***	.35***	.23***	.27***
School solidarity (T1)→ School solidarity(T2)→ Trust (T2)	.14***	.06	.15***	.10	.15***	.27***
School solidarity (T1)→ Trust (T1)→Trust (T2)	.31***		.24***		.34***	
<hr/>						
R ² Trust (T2)	.59		.47		.58	
R ² School solidarity (T2)	.57		.39		.40	
R ² Trust (T1)	.48		.31		.37	

X² (df) = 1196.57 (578); p < .001; CFI = .95; RMSEA = .05.

^aRegression path coefficients for social trust T2 on school solidarity (T2 and T1), and school solidarity T2 on school solidarity T1 constrained to be equal across groups.

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