The Role of Intentional Self Regulation, Lower Neighborhood Ecological Assets, and Activity Involvement in Youth Developmental Outcomes [1]

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Abstract

Extracurricular activities provide a key context for youth development, and participation has been linked with positive developmental outcomes. Using data from the 4-H Study of Positive Youth Development (PYD), this study explored how the intentional self regulation ability of youth interacted with participation in extracurricular activities to affect PYD among adolescents living in neighborhoods with relatively low ecological assets. In total, 545 youth were included in the study (50.3% female). Most of the youth were European American (41%) or Latino (37%; African American, 10%; Asian American, 7%; Native American, 4%; and other, 1%). In general, youth with the greatest capacity to self regulate benefitted the most, as compared to their peers with less capacity to self regulate, from involvement in extracurricular activities. Consistent with a developmental systems perspective, and specifically with bioecological theory, the findings from this study confirmed that, within lower asset settings, children with the most positive person-level factors (intentional self regulation) benefit the most from proximal processes such as extracurricular activity involvement.

Many factors contribute to adolescent development, including individual abilities, such as the ability to self regulate one's behavior and resources in the family, school, and neighborhood/community. The recognition that there are mutually influential links between the individual and his or her context, that these relations constitute the basic process of human development, and that the multiple contexts have resources that can influence youth development positively, can be attributed to developmental systems theories, such as bioecological systems theory (Bronfenbrenner, 1979), developmental contextualism (Lerner, 2002), dynamic systems theory (Thelen & Smith, 1998), and holistic person-context interaction theory (Magnusson, 1995). In turn, the positive youth development (PYD) perspective that emerged in the 1990s (Benson, 1997; Hamilton, Hamilton, & Pittman, 2004; Lerner, 1995) is rooted in such developmental systems theories and, as such, stresses the relationship between the developing individual and the context as well as the plasticity, or capacity for change, inherent in youth development (Lerner, et al., 2005). Positive development is optimal when there is a good fit (e.g., when there is congruence, or a match; Chess & Thomas, 1999; Lerner & Lerner, 1983) between the resources the individual seeks and the ecological assets found in the context in which he or she is embedded (Benson, Scales, Hamilton, & Sesma., 2006). Extracurricular activities have been suggested to be one type of asset that can potentially enhance development (Eccles & Gootman, 2002). Adolescents who are involved in extracurricular activities that match their individual needs may be particularly likely to experience positive developmental outcomes.

Extracurricular Activities as a Context for Development

Regardless of the specific location (i.e., at school, in the community, etc.), programs that promote positive youth development provide youth with (a) physical and psychological safety, (b) appropriate structure, (c) supportive relationships, (d) opportunities to belong, (e) positive

social norms, (f) support for efficacy and mattering, (g) opportunities for skill building, and (h) integration of family, school, and community efforts (Eccles & Gootman, 2002). Alternatively, time spent in unsupervised activities has been linked with antisocial behavior (Persson, Kerr, & Stattin, 2007). Positive youth development activities range in scope from single-focus programs, such as sports teams to national organizations such as 4-H, that provide a variety of experiences or programs to promote PYD or youth civic engagement and contributions. Indeed, participation in positive activities has been linked with positive developmental outcomes such as college attendance, volunteering, voting (Zaff, Moore, Papillo, & Williams, 2003), higher academic performance, decreased risk taking (Eccles & Barber, 1999), psychological resilience, self-worth, and school belonging (Fredricks & Eccles, 2006). Although sports involvement has features that promote positive development, several studies have consistently found some negative impacts of sports involvement, including high levels of stress (Larson, Hansen, & Moneta, 2006, Zarrett et al., 2009) and substance use (Eccles & Barber, 1999; Fauth, Roth, & Brooks-Gunn, 2007). Although extracurricular activity involvement potentially provides opportunities for positive development, these programs can vary in quality and commitment to a PYD philosophy.

Lower Neighborhood Ecological Assets

Positive development occurs when there is a match between the naturally developing person and their capacities with a supportive ecology or context (Benson, Scales, Hamilton, & Sesma, 2006). The neighborhood is one such context where youth can potentially find meaningful ways to actively participate in processes that affect their development (Benson, Scales, Hamilton, & Sesma, 2006). However, neighborhood effects are typically indirect and operate through more proximal processes that occur at the levels of the individual and family

(Leventhal, & Brooks-Gunn, 2000; Leventhal, Dupere, & Brooks-Gunn, 2009). For example, particularly for younger adolescents, access to neighborhood resources may be brokered by parents (Leventhal & Brooks-Gunn, 2000) or by adolescents' own ability to self regulate (Gestsdottir & Lerner, 2007; Zimmerman, Phelps, & Lerner, 2007). Although all youth stand to benefit from supportive contexts and ecologies, the strategies for promoting these assets may vary as a function of the individual's social location and internal resources (i.e., intentional self regulation).

The institutional resources model posits that the quality, diversity, and quantity of neighborhood resources such as recreational and social programs (parks, sports programs, and community centers), social services, and schools mediate neighborhood effects on youth well-being (Leventhal & Brooks-Gunn, 2000; Leventhal, Dupere, & Brooks-Gunn, 2009). Generally, utilization of these resources (for example, in extracurricular activities) is expected to be particularly beneficial for youth living in "disadvantaged" neighborhoods, i.e., in neighborhoods with a lower presence of resources, or "developmental assets" (Benson, Scales, Hamilton, & Sesma, 2006), in comparison to other neighborhood settings within a reference state, region, or nation. However, involvement in extracurricular activities could potentially have negative effects on youth living in such disadvantaged neighborhoods, for example those marked by high levels of violence, as participation could increase their exposure to neighborhood violence (Fauth, Roth, & Brooks-Gunn, 2007; Sampson, Raudenbush, & Earls, 1997).

Previous research has found that girls who live in lower asset neighborhoods exhibited higher levels of positive youth development and lower levels of depressive symptoms and risk behaviors when they engaged in extracurricular activities. However, the opposite effect was seen for boys living in lower asset neighborhoods; moderate to high levels of activity involvement

predicted lower levels of positive youth development and higher levels of risk behaviors (Urban, Lewin-Bizan, & Lerner, 2009). In addition, it is important to examine the role of different types of neighborhood resources. Neighborhood accessibility, human resources, physical resources, and collective activity have been shown to differentially interact with adolescent extracurricular activity involvement to predict PYD, depressive symptoms, and risk behaviors (Urban, Lewin-Bizan, & Lerner, 2009). Understanding the relationship between extracurricular activity involvement and developmental outcomes for youth living in lower asset neighborhoods characterized by a dearth of particular resources is particularly important since these youth have the greatest potential for benefitting from targeted interventions. Understanding which types of neighborhood resources are particularly important for youth living in lower asset neighborhoods is critical if future efforts are to be geared toward intervening at a neighborhood level to promote positive youth development. The role of intentional self regulation may also help to elucidate these findings as adolescents' ability to self regulate may moderate the effects of extracurricular activity involvement on developmental outcomes particularly in certain neighborhood contexts.

Adolescent Intentional Self Regulation

Intentional self regulation is a person-level characteristic that remains relatively stable across the early adolescent years, and is predictive of future positive development and decreased risk taking/problem behaviors (Gestsdottir & Lerner, 2007; Gestsdottir, Lewin-Bizan, von Eye, Lerner, & Lerner, 2009; Zimmerman, Phelps, & Lerner, 2007). Intentional self regulation may be defined according to processes of selection, optimization, and compensation (SOC). "Selection involves goals or outcomes; Optimization involves goal-related means to achieve success (desired outcomes); and Compensation involves a response to loss in goal-relevant means in order to maintain success or desired levels of functioning (outcomes)" (Baltes,

Lindenberger, & Staudinger, 2006, pp. 591). These three processes of intentional self regulation refer to the skill sets an individual uses to regulate his or her relationship with the environment. The SOC model emphasizes those aspects of the individual that would lead him or her to select and capitalize on the supports available within the ecological context and, as such, points to the plasticity of individual-context relations across the life-span (Lerner, 2005; Lerner, 2008).

Using data from the 4-H Study of Positive Youth Development, Gestsdottir and Lerner (2007) and Zimmerman, Phelps, and Lerner (2007) found that, in early adolescence, intentional self regulation is most appropriately measured as an undifferentiated, global process. In other words, the three distinct components of intentional self regulation that are typically found in adult populations (selection, optimization, and compensation) are not clearly differentiated in early adolescence. In addition, they found that intentional self regulation remains stable across the early adolescent years (grades five, six, and seven) and is predictive of future increased positive development and decreased risk taking/problem behaviors.

Intentional self regulation may help to explain why some youth, who despite being embedded in relatively asset poor environments, are able to achieve developmental success. For example, youth who demonstrate the highest levels of intentional self regulation would be expected to use goal directed behavior to seek out and utilize resources available to them in their environment. These youth may be more inclined to engage in extracurricular activities and may be particularly attuned to optimizing the fit between their own goals and the limited resources available to them. Thus, we might expect that youth who exhibit high levels of intentional self regulation would benefit the most from engagement in extracurricular activities.

The Current Study

Bioecological theory indicates that the developmental effects of process will vary as a function of Person, Process, Context, and Time (Bronfenbrenner & Morris, 2006). Specifically, process is expected to have its greatest impact on children in disadvantaged settings such as lower asset neighborhoods. However, within these disadvantaged settings, children with the most positive person-level factors (e.g., involving intentional self regulation) are expected to benefit the most. Proximal processes by design (such as participation in extracurricular activities) aimed at providing developmental resources and encouraging engagement in proximal processes over time are expected to positively impact outcomes of competence, particularly for youth in more disadvantaged settings (Bronfenbrenner & Morris, 2006).

The current study applies this theory and begins to explore how individuals' ability to self regulate interacts with participation in extracurricular activities to affect the course of positive youth development for youth living in neighborhoods with varying types of low ecological assets. Specifically, this is an exploratory study that tests whether adolescents' intentional self regulation moderates the effects of extracurricular activity involvement on developmental outcomes including positive youth development, depressive symptoms, and risk behaviors. We hypothesize that youth who have the highest levels of intentional self regulation will benefit the most (high levels of PYD and low levels of depressive symptoms and risk behaviors) from participation in extracurricular activities.

This hypothesis is tested in the context of lower asset neighborhoods specifically because bieocological theory posits that youth living in disadvantaged neighborhoods are expected to benefit the most from engagement in proximal processes such as extracurricular activities. In addition, person-environment fit suggests that those youth who exhibit the highest levels of

intentional self regulation will be the most able to take advantage of and benefit the most from even limited resources available in their neighborhoods. In the current study, this relationship was not tested for youth in resource rich neighborhoods. However, previous research has found that activity involvement did not provide the same benefits for girls living in higher asset neighborhoods as it did for girls living in lower asset neighborhoods. Girls living in higher asset neighborhoods exhibited lower levels of PYD and higher levels of risk behavior and depressive symptoms at moderate to high levels of activity involvement. In turn, for boys living in higher asset neighborhoods, moderate to high levels of activity involvement were predictive of higher levels of PYD and lower levels of risk behaviors (Urban, Lewin-Bizan, & Lerner, 2009). In addition, previous studies suggest that extracurricular activities are potent assets in the positive development of youth.

For instance, in a review of the out-of-school-time (OST) activities literature in regard to adolescent development, Mahoney, Vandell, Simpkins, and Zarrett (2009) point to the beneficial influence on youth personal and social development on the intensity and duration of adolescent involvement in OST activities. Mahoney, et al. explain that OST activities constitute a key developmental asset linked to PYD. Benson, et al. (2006) agree. They note that OST activities involving supportive and caring adults (e.g., mentors), skill-building activities pertinent to leading healthy and productive lives, and the presence of positive peers (see too Lerner, 2004) are found in OST activities and make them effective assets for promoting PYD. Benson, et al. (2006) suggest also that "more is better," that is, that the more that youth avail themselves of the resources in OST activities, the greater the likelihood of their PYD.

However, more may not always be better (e.g., see Zarrett, et al., 2009). The assets constituted by OST activities may differentially affect developmental outcomes for some youth

in some contexts (Theokas & Lerner, 2006; Urban, Lewin-Bizan, & Lerner, 2009). Therefore, the moderating role of intentional self regulation on extracurricular activity involvement is examined separately for four categories of neighborhood assets: accessibility, human resources, physical resources, and collective activity.

The current study is a follow-up to Urban, Lewin-Bizan, and Lerner (2009), which examined whether participation in extracurricular activities had a more positive effect for youth living in lower asset neighborhoods as compared to higher asset neighborhoods. The results of this research found significant neighborhood asset level x activity involvement effects on PYD for girls in terms of neighborhood accessibility and for boys in terms of neighborhood human resources; on depressive symptoms for girls in terms of neighborhood human resources and neighborhood physical resources; and, on risk behaviors for girls and boys in terms of neighborhood accessibility and neighborhood physical resources. These findings indicate that types of neighborhood resource can differentially affect developmental outcomes.

Therefore, the present, exploratory study uses the same neighborhood asset dimensions to assess whether the moderating effects of intentional self regulation on extracurricular activity involvement occur when lower levels of specific types of neighborhood assets are available. Since previous studies using the data from the 4-H Study of Positive Youth Development have found gender differences in patterns of activity involvement (Zarrett, et al., 2007) and outcomes (Jelicic, Bobek, Phelps, Lerner, & Lerner, 2007; Theokas & Lerner, 2006), particularly for the relationship between activity involvement and developmental outcomes (Urban et al., 2009), the data for this study were analyzed separately for boys and girls.

Method

The data for this research are derived from the first wave (school year 2002-2003) and the third wave (school year 2004-2005) of the 4-H Study of Positive Youth Development (Lerner, et al., 2005), when the participants were in fifth and seventh grade, respectively. This study utilizes data from a subsample of the larger national sample that was selected due to the availability of neighborhood ecological asset measures collected by Theokas and Lerner (2006). This subsample was selected to include a diverse set of individual demographic characteristics, a variety of neighborhood types (e.g., urban, suburban, rural), and different regions of the United States (Northeast, North Central, Southeast, and Southwest).

The original subsample of youth (N = 626: 322 girls and 304 boys) from six school districts (N = 17 schools) were selected from the larger sample of youth in the national 4-H Study of Positive Youth Development. As previously noted, this subsample was selected based on the work of Theokas and Lerner (2006). The subsample was further limited by including only those youth who lived in neighborhoods that scored lower on the neighborhood asset variable being assessed. Some youth lived in neighborhoods that scored lower on more than one neighborhood asset variable. Forty-three youth scored below the median for all four neighborhood asset dimensions, while 50 youth scored below the median for physical resources only, 18 youth scored below the median for human resources only, 22 youth scored below the median for collective activity only, and 55 youth scored below the median for accessibility only. So, a youth who lived in a neighborhood that scored low on both physical resources and human resources would be included in analyses for both neighborhood contexts. There is tremendous variability in the distribution of neighborhood asset dimensions across the census tracts included in this study. For example, just because a given census tract has low levels of physical resources,

this does not mean that it is also more likely to have low levels of human resources. The neighborhood asset dimension correlations for the complete sample are presented in Table 1 and are broken down by gender in Table 2.

<<Insert Table 1 and Table 2 here>>

In total, 545 youth were included in the study (274 girls, 271 boys). In order to identify the subset of youth living in lower asset neighborhoods, a median split was created for each of the neighborhood asset categories (boys physical resources median = -.08, girls physical resources median = -.59, boys collective activity median = .00, girls collective activity median = .00, boys accessibility median = .13, girls accessibility median = .04, boys human resources median = .33, and girls human resources median = .23). A median split was used in order to capture those youth who lived in relatively lower asset neighborhoods as compared to those youth in the sample who lived in relatively higher asset neighborhoods. This median split does not represent "absolute" low asset neighborhoods as the categorization of neighborhood asset level is specific to this sample and therefore cannot be generalized beyond this study. A median split was used rather than the bottom quartile due to low power. Future research will need to cross-validate these findings and may benefit from looking at youth in the bottom quartile for neighborhood assets.

Youth who lived in neighborhoods that scored below the median value for any given asset category were included in the analyses. There were a total number of 214 youth living in lower collective activity neighborhoods (N = 107 girls; N = 107 boys), 292 youth living in lower physical resource neighborhoods (N = 136 girls; N = 156 boys), 311 youth living in lower accessibility neighborhoods (N = 153 girls; N = 158 boys), and 312 youth living in lower human resource neighborhoods (N = 162 girls; N = 150 boys).

The youth participants were a diverse group of fifth-grade students at the first wave of data collection (50.2% female, average household income per capita = $ 12,340.93). Most of the youth were European American (41%) or Latino (37%; African American, 10%; Asian American, 7%; Native American, 4%; and other, 1%). See Table 3 for descriptive statistics.

<<Insert Table 3 here>>

Missing Data

Of the 545 adolescents included in the analyses, 180 had complete data on all outcome variables of this study and 378 had complete data on all explanatory variables of this study. Since multiple imputation is preferred compared with other methods for handling missingness such as listwise deletion and mean replacement (Jelicic, Phelps, & Lerner, 2009), when missing data occurred for the included 545 adolescents, missing values were replaced using multiple imputation based on chained regression equations. Multiple imputation was implemented using Stata's user-written program ice (imputation by chained equations) ran on Stata version 10 SE (Royston, 2004, 2005a, 2005b).

The idea of multiple imputation is to create multiple imputed data sets for a data set with missing values. The analysis of a statistical model is then done on each of the multiple data sets. The multiple analyses are then combined to yield a single set of results applying "Rubin's rules" for combining the results of an analysis of multiply imputed data sets (Rubin, 1987). In the current study, 10 data sets combining observed and imputed values were created as suggested by Graham, Olchowski and Gilreath (2007). Missing values for each variable were imputed by regressing the variable with missing data on a set of predictor variables.

Data Collection

Youth were given a two-hour time period at school to complete the student questionnaire which included measures related to the Five Cs (competence, confidence, connection, character, and caring) of positive youth development (PYD), individual and ecological assets, problem behavior, developmental regulation, extracurricular activity involvement, and demographics (Lerner, et al., 2005). Parents/guardians were also asked to complete a consent form and questionnaire that included items about the family and the neighborhood.

Outcome Measures

Three outcomes were used including a composite measure of positive youth development and two measures of negative development: depressive symptoms and risk behavior. All three measures were obtained from the student questionnaire at the third wave of data collection, when the youth were in the 7th grade. Cronbach's alphas reported in this study are derived from the entire 4-H Study sample of Grade 5 and/or Grade 7 participants**.**

Positive Youth Development. The PYD composite score is based on 17 well-validated scales that assess positive adolescent characteristics (Lerner, et al., 2005). The PYD composite score (for this sample, mean = 74.58, SD = 10.65; α = .95) was calculated using the mean scores on the confidence (α = .87), competence (α =.85), character (α = .90), caring (α = .84), and connection (α = .92) subscales. Previous research (Lerner, et al., 2005) found evidence supporting the factors representing the Five Cs and their convergence on the PYD latent construct (see too, Phelps, et al., in press).

Depressive Symptoms. Negative developmental characteristics were measured with two scales representing internalizing (depressive symptoms) and externalizing (delinquency and substance use) problems. The Center for Epidemiological Studies Depression (CES-D) scale is a

20-item self-report measure of depressive symptomatology (Radloff, 1977). Depressive symptoms were conceptualized as feelings of frustration, sadness, demoralization, loneliness, and pessimism about the future (Radloff, 1977). Example items include "During the past week I was bothered by things that usually don't bother me" and "During the past week I felt sad." The response format ranges from 0 = *rarely or none of the time* to 3 = *most or all of the time* to indicate how frequently the respondent experienced symptoms during the previous two weeks. However, our participants reported how often they experienced symptoms during the past week. Items were summed for a total score (for this sample, mean = 14.04, SD = 10.07; $\alpha = .87$), with a maximum possible score of 60, and higher scores are indicative of higher depressive symptomatology.

Risk Behaviors. We measured indicators of risk behavior and delinquency with a set of questions derived from items included in the Search Institute's Profiles of Student Life-Attitudes and Behavior (PSL-AB) scale (Leffert et al., 1998) and the Monitoring the Future (2000) questionnaire. Five items assess the frequency of substance use (e.g., smoked cigarettes, drank alcohol, used marijuana or hashish) in the past year. The response format ranges from 1 = *never* to 4 = *regularly*. Four items assess the frequency of delinquent behaviors. The response format for these items ranges from 1 = *never* to 5 = *five or more times*. A sample delinquency item is "During the last 12 months, how many times have you hit or beat up someone?" Items were weighted and combined to create a total score (for this sample, mean = 2.55, SD = 3.24; $\alpha = .84$) that could range from 0 to 30, and higher scores are indicative of more risk behaviors.

Predictor Variables

The hypothesis was assessed using several predictor variables including standardized per capita family income, intentional self regulation (SOC), and activity involvement all measured at

Grade 5. Average per capita family income was measured with parent surveys when the youth were in Grade 5. Neighborhood asset scores (physical resources, human resources, collective activity, and accessibility) were also measured when the youth were in Grade 5.

Intentional self regulation. Intentional self regulation (α = .55) was measured using the nine-item version of the SOC model (Gestsdottir & Lerner, 2007). Each participant had a SOC score which is the average of the nine dichotomous items (range 0-1). Examples of selection items include: "When I decide upon a goal, I stick to it" and "When I think about what I want in life, I commit myself to one or two important goals." Optimization items include "When I want to achieve something difficult, I wait for the right moment and the best opportunity" and "I think about exactly how I can best realize my plans." Compensation items include "When things don't work the way they used to, I look for other ways to achieve them" and "When things aren't going so well, I accept help from others."

Activity Involvement. Intensity of extracurricular activity involvement (α = .94) at Grade 5 was obtained from the student questionnaires. Youth ranked their involvement in several activities where 0 = no involvement, 1 = a few times a year, 2 = once a month, 3 = several times a month, 4 = once a week, and 5 = several times a week. Youth were asked to indicate their level of involvement in the following activities: Girl Scouts/Boy Scouts, 4-H Clubs, Boys Clubs/Girls Clubs, martial arts, tutoring, paid work, mentoring/peer advising, dance, music, religious youth group, academic clubs, school government, religious education, sports, school band, acting/drama, volunteer work, YMCA/YWCA, Big Brothers/Big Sisters, and after school child care program. Each youth's total level of activity involvement was calculated by summing across activities and calculating the average level of activity involvement. Previous work on a similar population found that at high levels of activity involvement, positive effects leveled off or

diminished and negative effects leveled off or increased; therefore a quadratic term for activity involvement is also included (Urban, Lewin-Bizan, & Lerner, 2009). The activity variable was centered before squaring to reduce correlations between the original and squared variables.

Neighborhood Ecological Assets. Theokas and Lerner (2006) specified four categories of ecological assets that organize the resources and opportunities available to youth in the context of the family, school, and neighborhood. Within each context, they documented four dimensions of assets including: human resources, physical or institutional resources, collective activity, and accessibility. With neighborhoods defined by census tracts, data for the observed neighborhood ecological assets were derived from census data, online resources, the National Center for Educational Statistics, and student questionnaires (see Theokas & Lerner, 2006 for a complete description of measures and a discussion of the methods used to derive the neighborhood ecological assets).

Human resources refers to the strengths, skills, talents, and abilities of people and in the neighborhood context is operationalized by the percent of college educated residents, the percent of employed adult males, and the presence of at least one non-parental adult mentor. Physical and institutional resources refer to opportunities for recreation, learning, and engaging with the physical and social world. In the neighborhood context, this asset is documented by the presence of a local library, youth facilities (i.e., local youth center, Boys & Girls Club, YMCA), and recreation opportunities (i.e., city/town parks, state/national parks, recreation program). Accessibility refers to the availability to people of human resources and of opportunities in a given context, and is operationalized in the neighborhood context by neighborhood stability and the ratio of adults to children. Collective activity refers to the relationships and connections among institutions, youth, and community members and is operationalized in the neighborhood

context by the presence of community organizations (e.g., a community center or a community development corporation), neighborhood groups, and youth coalitions. It should be noted that the asset of collective activity differs from the neighborhood characteristics of "collective efficacy" measured by Sampson and his colleagues (e.g., Sampson, Raudenbush, & Earls, 1997). Collective efficacy is a perceptual measure, indexed by participant responses to assessments of their views of the character of their neighborhood. Collective activity is an objective index of actual instances of adolescent-adult collaborative actions within a community.

Results

Analyses of the data from Waves 1 and 3 - that is, Grades 5 and 7 of the 4-H Study data set – were done to determine whether extracurricular activity involvement differentially affects youth living in lower asset neighborhoods depending upon their individual capacity to self regulate. However, prior to conducting analyses to address these goals, preliminary analyses were undertaken to describe the means and standard deviations of the variables in the measurement model of this research (Table 3) and, as well, to assess the zero-order correlations among these variables (Tables 1 and 2).

The results showed that, in general, the youth in the sample exhibited high levels of PYD and low levels of depressive symptoms and risk behaviors. As would be expected, several neighborhood asset dimensions were significantly correlated. For both boys and girls neighborhood physical resources were negatively correlated with collective activity, human resources were positively correlated with accessibility and negatively correlated with collective activity, and accessibility was negatively correlated with collective activity. For girls, neighborhood physical resources were also positively correlated with accessibility, and for boys, neighborhood physical resources were negatively correlated with human resources. Activity

involvement was not significantly correlated with any of the outcome variables for girls or boys. Activity involvement and intentional self regulation were positively correlated for boys and were not significantly correlated for girls. As expected, intentional self regulation was positively correlated with PYD and negatively correlated with risk behaviors and depressive symptoms for both boys and girls. For both boys and girls, PYD was positively associated with human resources. For boys, PYD was also positively associated with physical resources and accessibility, and negatively associated with collective activity. For girls, PYD was positively associated with collective activity and negatively associated with physical resources. For both boys and girls, risk behaviors were positively correlated with physical resources and negatively correlated with human resources. For both boys and girls, depressive symptoms were positively correlated with physical resources and negatively correlated with accessibility and human resources. In addition, for boys, depressive symptoms were positively correlated with collective activity.

Hierarchical multiple regression was used to test the hypothesis that, of the youth living in lower asset neighborhoods, those youth who have a greater capacity to self regulate would benefit more from involvement in extracurricular activities. For each of the three outcome variables (PYD, depressive symptoms, and risk behaviors), eight models were tested: male and female for each neighborhood asset type: physical resources, human resources, collective activity, and accessibility. The first step was an unconditional model without any predictors. Next, the individual/family level variables were added (SOC and income). Linear and quadratic terms for activity involvement were added at step three to examine how activity involvement affects PYD, depressive symptoms, and risk behaviors. The quadratic term was included to test for potential negative effects of high levels of activity involvement. In the last step, a SOC by

activity involvement interaction term was entered as well as a SOC by activity involvement squared interaction term. The interaction terms were added to test whether SOC moderated the effects of activity involvement.

Neighborhood Assets and Intentional Self Regulation (SOC)

The results of the full model including all predictor variables and covariates are presented for PYD in Table 4, Risk Behaviors in Table 5 and Depressive symptoms in Table 6. The relationship between neighborhood assets and intentional self regulation was relatively straightforward. In all neighborhood asset contexts, higher levels of individual intentional self regulation predicted higher levels of PYD and lower levels of risk behaviors for both boys and girls. In most neighborhood contexts, higher levels of individual intentional self regulation predicted lower levels of depressive symptoms. However, for girls living in lower physical resource neighborhoods and lower collective activity neighborhoods, intentional self regulation alone did not significantly predict depressive symptoms.

<<Insert Tables 4, 5 and 6 about here>>

Intentional Self Regulation, Activity Involvement, and Positive Youth Development

There were significant interactions between activity involvement and intentional self regulation predicting PYD for both boys and girls living in lower accessibility neighborhoods and lower human resource neighborhoods and for boys living in lower physical resource neighborhoods and lower collective activity neighborhoods. For both boys (Figure 1) and girls (Figure 2) living in lower human resource neighborhoods, intentional self regulation interacted with activity involvement in the expected direction to predict positive youth development. [2] Youth with a greater capacity to self regulate benefitted in Grade 7 the most from activity involvement at Grade 5 and exhibited the highest levels of PYD at Grade 7 when engaged in low

to moderate levels of activity involvement and the lowest levels of decline in PYD at Grade 7 when engaged in higher levels of activity involvement (note that the quadratic interaction term was only significant for boys).

<<Insert Figures 1 and 2 here>>

A similar pattern was found for boys living in lower accessibility neighborhoods (Figure 3), boys living in lower physical resource neighborhoods (Figure 4), and boys living in lower collective activity neighborhoods (Figure 5). Youth with a greater capacity to self regulate benefitted the most in Grade 7 from activity involvement at Grade 5: they exhibited the highest levels of PYD at Grade 7 when engaged in low to moderate levels of activity involvement and the lowest levels of decline in PYD at Grade 7 when engaged in higher levels of activity involvement (note that the quadratic interaction term was only significant for boys living in lower collective activity neighborhoods).

<<Insert Figures 3, 4 and 5 here>>

For girls living in lower accessibility neighborhoods, intentional self regulation interacted with activity involvement at Grade 5 to predict positive youth development at Grade 7; however, this association was contrary to expectation (Figure 6). The relationship between activity involvement and PYD was primarily linear for girls with the greatest capacity to self regulate, such that increasing levels of activity involvement predicted a slight decline in PYD. Girls with a greater capacity to self regulate exhibited the highest levels of PYD at low to moderate levels of activity involvement, as compared to their peers with less capacity to self regulate. The relationship between activity involvement and PYD was curvilinear for girls with the least capacity to self regulate. These girls exhibited declining levels of PYD as activity involvement

increased from low to moderate levels; however, at high levels of activity involvement, they exhibited the highest levels of PYD.

<<Insert Figure 6 here>>

Intentional Self Regulation, Activity Involvement, and Risk Behaviors

There were significant linear and quadratic interactions between activity involvement and intentional self regulation at Grade 5 predicting risk behaviors at Grade 7 for girls living in lower physical resource, collective activity, and human resource neighborhoods. For girls living in lower collective activity neighborhoods, intentional self regulation interacted with activity involvement in the expected direction to predict risk behaviors (Figure 7). Youth with a greater capacity to self regulate benefitted the most from activity involvement at Grade 5: they exhibited the lowest levels of risk behaviors at Grade 7 when engaged in low to moderate levels of activity involvement and the lowest levels of increase in risk behaviors when engaged in higher levels of activity involvement.

<<Insert Figure 7 here>>

For girls living in lower physical resource neighborhoods (Figure 8) and lower human resource neighborhoods (Figure 9), intentional self regulation interacted with activity involvement at Grade 5, generally in the expected direction, to predict risk behaviors at Grade 7. Girls with the greatest capacity to self regulate exhibited the lowest levels of risk behaviors at Grade 7 when engaged in low to moderate activity involvement at Grade 5. However, the trend was generally linear for high self-regulating girls, such that at higher levels of activity involvement these girls exhibited the highest levels of risk behaviors. The inverse relation was found for girls with the least capacity to self regulate, such that at low to moderate levels of

activity involvement these girls exhibited higher levels of risk behaviors and at moderate to high levels of activity involvement they exhibited the lowest levels of risk behaviors.

<<Insert Figures 8 and 9 here>>

Intentional Self Regulation, Activity Involvement, and Depressive Symptoms

There were significant linear and quadratic interactions between activity involvement and intentional self regulation at Grade 5 predicting depressive symptoms at Grade 7 for girls living in lower physical resource neighborhoods (Figure 10) and in lower human resource neighborhoods (Figure 11). For girls living in lower human resource neighborhoods, intentional self regulation interacted with activity involvement in the expected direction to predict depressive symptoms. Youth with a greater capacity to self regulate benefitted the most from activity involvement at Grade 5 and exhibited the lowest levels of depressive symptoms at Grade 7 when engaged in low to moderate levels of activity involvement; they showed also the lowest levels of increase in depressive symptoms when engaged in higher levels of activity involvement.

For girls living in lower physical resource neighborhoods, the results are less clear. Girls with the greatest capacity to self regulate exhibited the lowest levels of depressive symptoms at Grade 7 when engaged in low levels of activity involvement at Grade 5. Regardless of capacity to self regulate, all of the youth exhibited increases in depressive symptoms as activity levels increased from low to moderate levels, however, at higher levels of activity involvement, all youth exhibited a decline in depressive symptoms.

<<Insert Figures 10 and 11 here>>

Summary of Findings

In general, youth with the greatest capacity to self regulate benefitted the most, as compared to their peers with less capacity to self regulate, from involvement in extracurricular activities. As expected, high self-regulating boys in all four lower neighborhood resource contexts and girls living in lower human resource neighborhoods exhibited higher levels of positive youth development when engaged in activities, particularly at low to moderate levels. Similarly, high self-regulating girls living in lower collective activity neighborhoods exhibited lower levels of risk behaviors, and high self-regulating girls living in lower human resource neighborhoods exhibited lower levels of depressive symptoms when engaged in activities.

In addition, while generally consistent with the hypothesis, a second pattern of results emerged for girls. High self-regulating girls living in lower physical resource and human resource neighborhoods exhibited the lowest levels of risk behaviors when engaged in low to moderate levels of activity involvement; they showed higher levels of risk behaviors when engaged in higher levels of activity involvement. In regard to depressive symptoms, a similar pattern emerged for high self-regulating girls living in lower physical resource neighborhoods. In addition, and also consistent with this pattern of results, high self-regulating girls living in lower accessibility neighborhoods exhibited the highest levels of positive youth development when engaged in low to moderate levels of activity involvement; they showed lower levels of positive youth development when engaged in higher levels of activity involvement. There was no significant self regulation x activity involvement interaction found for boys in regard to risk behaviors or depressive symptoms.

Discussion

Consistent with a developmental systems perspective and specifically bioecological theory, the findings from this study confirmed that within disadvantaged settings, children with the most positive person-level factors (intentional self regulation) benefit the most from proximal processes such as extracurricular activity involvement. Those youth who exhibited the highest levels of intentional self regulation were generally the most capable of taking advantage of and benefiting from even limited resources available in their neighborhoods. A key hypothesis of the positive youth development perspective (Lerner, 2009; Lerner, Phelps, Forman, & Bowers, 2009) is that activities are developmental assets and, as such, provide an important source of youth development. Activities act as resources for positive development by providing structured and challenging activities in safe environments and therefore, increased levels of activity involvement should generally result in better developmental outcomes. Participation in such activities can provide youth who would otherwise not be exposed to developmental assets in their neighborhoods, with opportunities for positive development. Accessing extracurricular activities may be particularly difficult for youth living in lower asset neighborhoods and, therefore, those youth with the greatest capacity for self regulation may be better equipped to locate and take advantage of opportunities for engagement.

The presence of a significant interaction between activity involvement and intentional self regulation was present for both boys and girls living in lower collective activity neighborhoods. These neighborhoods may lack strong collective efficacy, as evidenced perhaps by the dearth of community organizations, neighborhood groups, and youth coalitions. Yet, in these neighborhoods, developmental success is achieved for those youth who have the greatest capacity to self regulate and are able to select positive goals, optimize the limited resources

available to them (i.e., by participating in extracurricular activities), and compensate when faced with challenges. In lower collective activity neighborhoods, boys exhibited the highest levels of PYD and girls exhibited the lowest levels of risk behaviors across all levels of activity involvement.

We also found a significant interaction between activity involvement and intentional self regulation predicting PYD for youth living in lower accessibility neighborhoods. These neighborhoods lack residential stability and have a low ratio of adults to children. Previous research found that compared to girls who live in higher accessibility neighborhoods, girls living in lower accessibility neighborhoods had the highest levels of PYD when engaged in extracurricular activities (Urban, et al., 2009). Within these lower accessibility neighborhoods, the girls who are most capable of self regulating and are involved in low to moderate levels of extracurricular activities are achieving developmental success, as demonstrated by high levels of PYD. Living in lower accessibility neighborhoods may motivate youth to seek out opportunities to interact with supportive adults and immersion in extracurricular activities may expose them to supportive adults and challenging activities that they cannot obtain in their other contexts (Eccles & Gootman, 2002).

There was less consistency in the presence of a significant interaction between activity involvement and intentional self regulation for youth living in lower physical resource neighborhoods. These neighborhoods lack libraries, youth facilities, and recreation opportunities such as parks. Previous research found that when compared to girls who live in higher physical resource neighborhoods, girls living in lower physical resource neighborhoods had the lowest levels of depressive symptoms and risk behaviors when engaged in extracurricular activities (Urban, et al., 2009). Within these lower physical resource neighborhoods, the girls who are

most capable of self regulating and are involved in low to moderate levels of activity involvement are achieving developmental success, as exhibited by low levels of risk behaviors and depressive symptoms. The exception is that, at high levels of activity involvement, girls who are the most capable of self regulation exhibit high levels of risk behaviors and depressive symptoms. Again, immersion in extracurricular activities may provide access to supports that are otherwise unavailable in other contexts (Eccles & Gootman, 2002).

Finally, the presence of a significant interaction between activity involvement and intentional self regulation was present for both boys and girls living in lower human resource neighborhoods. These neighborhoods lack human capital as evidenced by low adult employment rates, low levels of college educated residents, and low levels of youth with adult mentors. Previous research found that when compared to girls who live in higher human resource neighborhoods, girls living in lower human resource neighborhoods had the highest levels of depressive symptoms when engaged in extracurricular activities (Urban, et al., 2009). However, within these lower human resource neighborhoods, the girls who were most capable of self regulation exhibited low levels of depressive symptoms when engaged in extracurricular activities.

Similarly, girls living in lower human resource neighborhoods who are the most capable of self regulating and are engaged in low to moderate levels of extracurricular activities are achieving developmental success as exhibited by low levels of risk behaviors. Finally both girls and boys who are the most capable of self regulating and are engaged in extracurricular activities are achieving developmental success as exhibited by high levels of positive youth development. Previous research found that when compared to boys who live in higher human resource neighborhoods, boys living in lower human resource neighborhoods had the lowest levels of

PYD when engaged in extracurricular activities and, as well, their levels of positive youth development declined as activity involvement increased (Urban, et al., 2009). Within these lower human resource neighborhoods, the same curvilinear pattern emerged; however, boys who were most capable of self regulating exhibited the highest levels of positive youth development across all levels of activity involvement.

The results of this study support the general finding in the extracurricular activity literature that the after-school context interacts with multiple factors influencing adolescent development as well as with individual characteristics, preferences, and skills that youth possess (Fuath, Roth, & Brooks-Gunn, 2007). These results are also consistent with previous results from the 4-H Study of Positive Youth development that found that youth living in lower asset neighborhoods who participated in increased levels of extracurricular activities had the most positive developmental outcomes including increased levels of PYD and decreased levels of risk behaviors and depressive symptoms for girls (Urban et al., 2009). Intentional self regulation plays an important role in influencing developmental outcomes and its effects operate through extracurricular activity involvement. Individual identity and peer group choices have been identified as precursors to and products of the kinds of activities in which youth choose to participate (Eccles & Barber, 1999). Intentional self regulation may also influence activity choices which would help to explain the findings in this study. Youth who are better able to self regulate may be selecting higher quality programs and/or may find activities that are a better fit for their individual needs. Activity choices may also influence the peer groups with whom the adolescent interacts. Youth who are better able to self regulate may not only be selecting “better” activities, but they may also be selecting more positive peer groups. Together, these factors could

provide a supportive context that buffers the youth from the potential negative effects of living in a lower asset neighborhood.

Clearly, intentional self regulation, as indexed by SOC, is linked to PYD among youth living in lower asset settings. Such relations suggest that with the skill sets indexed by SOC, a young person may gain from even a lower resource neighborhood the assets needed for positive growth. However, given the plasticity, the potential for systematic change, that defines the strengths of youth within the PYD perspective (J. Lerner, et al., 2009), optimism is warranted that community-based programs that seek to promote gains in SOC skills can be successful. Indeed, Lerner (2004) has noted that effective youth development programs are marked in part by the inculcation through effective mentoring of the sorts of selection, optimization, and compensation skills involved in the SOC model of intentional self regulation. The success of such programs in fostering the growth of SOC-related skills suggests that it is reasonable to launch an effort to enhance positive development through mentoring that is aimed at elevating the intentional self regulation skills of diverse youth.

Limitations and Future Directions

The current study utilized an objective approach to measuring neighborhood assets and is therefore subject to the criticisms that accompany the use of such measures including that they fail to capture the degree to which any given resource is actually valued by those for whom it is intended to serve (Leventhal & Brooks-Gunn, 2000; Leventhal et al., 2009). However, despite this limitation, the current study's use of census data and internet resources to catalogue neighborhood assets had two advantages: it provided consistent information on available resources for individuals living in the same neighborhood; and, it avoided confounding the availability of neighborhood resources with the average SES of the neighborhood. Therefore, this

approach to measuring neighborhood assets was viewed as more useful than subjective measurement techniques.

In addition to the challenges associated with measuring and detecting neighborhood effects, there are additional challenges associated with measuring and cataloguing adolescent activity involvement. Youth are typically involved in a cacophony of activities (Balsano et al., 2009; Theokas, Lerner, Phelps, & Lerner, 2006), making it difficult to capture the types of activities and the amount of time spent in these activities. The current study used a self-report approach to cataloguing activity involvement and, as such, failed to capture variation in the quality of the activities. In addition to these challenges, there is not yet clear consensus regarding the optimal amount of time youth should spend engaged in extracurricular activities (Mahoney et al., 2006; Mahoney et al., 2009). Findings from the current study begin to elucidate the more nuanced differences in developmental outcomes that have previously been observed by unpacking the relationship between intentional self regulation, neighborhood assets, activity involvement, and gender.

The gender differences observed in the current study could potentially be attributed to differences in the types of activities selected by boys and girls (Sharp, Coatsworth, Darling, Cumsille, & Ranieri, 2007). Girls tend to report more socializing activities (i.e., spending time with friends), instrumental activities (i.e., studying, paid work), arts and literary activities (i.e., reading, writing), while boys tend to report more sports/physical activities (i.e., football, exercise) (Luthar et al., 2006; Sharp et al., 2007). Specific types of activities have also been associated with different developmental outcomes (Eccles & Barber, 1999; Larson, Dworkin, & Gillman, 2001). Arguably, the best examples of the link between specific extracurricular activities and specific outcomes occur in regard to youth participation in sports. Sports

participation is the most frequently occurring extracurricular activity and it has been associated with psychological well-being, positive social development, and higher academic and occupational achievement through young adulthood (e.g., Barber, Eccles, & Stone, 2001; Brunelle, Danish, & Forneris, 2007), presumably because youth who participate in sports learn values and skills associated with such characteristics as initiative and goal setting (.g., Larson, Hansen, & Moneta, 2006). However, Zarrett, et al. (2009) found that these benefits of sports participation may depend in part on specific combinations of multiple activities in which youth participated along with sports. In particular, participation in a combination of sports and youth development programs was related to PYD and youth contribution, even after controlling for the total time youth spent in OST activities and their sports participation duration.

Conclusions

When the results of this study are considered together with the previous results reported by Urban et al. (2009), the findings are consistent with a developmental systems perspective and particularly bioecological theory. The results of previous research (Urban et al., 2009) found that extracurricular activity involvement had its greatest impact on youth living in more disadvantaged settings, defined as lower asset neighborhoods. However, as indicated in the present study, youth, and especially girls, with the most positive person-level factors (intentional self regulation) benefit the most from proximal processes such as extracurricular activity involvement.

Future studies need to explore person-environment fit particularly for youth residing in lower asset neighborhoods, and to ascertain the replicability and potential bases for the sex differences identified in the present research. Nevertheless, it seems clear from the present results that youth who are imbued with a strong capacity for intentional self regulation will be

more inclined to seek resources in their environments to support their development. If they consistently are unable to locate and utilize such resources they may become discouraged. Extracurricular activities provide an excellent opportunity to provide youth with meaningful activities that can support their development. The key will be to align individual youth skills, talents, and desires with appropriate extracurricular opportunities. This step is particularly important for those youth who may find it difficult to find assets and resources in other aspects of their environment, such as their neighborhoods.

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Footnote

[2] For the purposes of graphing the SOC x activity involvement interactions (Figures 1 to 11) low SOC was set at -0.5, medium SOC was set at 0, and high SOC was set at 0.5.

Table 1. Correlations among Neighborhood Asset Scores, Dependent Variables, and Covariates.

Variable	1	2	3	4	5	6	7	8	9	10	11
1 Physical Res	1										
2 Collective Act	-.32	1									
3 Accessibility	n/s	-.33	1								
4 Human Res	n/s	-.12	.14	1							
5 PYD	n/s	n/s	.07	.31	1						
6 Risk Behavior	.15	-.06	-.06	-.10	-.38	1					
7 Depression	.08	n/s	-.08	-.14	-.35	.21	1				
8 Income	.07	-.21	.28	.52	.23	-.07	-.15	1			
9 SOC	.03	-.06	.04	.17	.36	-.23	-.11	.13	1		
10 Activity Inv.	-.13	n/s	.03	.10	.03	n/s	n/s	n/s	n/s	1	
11 Activity Inv Sq.	n/s	.03	n/s	-.03	-.05	.07	n/s	-.09	n/s	.62	1

Note: All correlations are significant unless otherwise specified.

Table 2. Correlations among Neighborhood Asset Scores, Dependent Variables, and Covariates by Sex

Variable	1	2	3	4	5	6	7	8	9	10	11
1 Physical Res	1	-.37	n/s	n/s	-.05	.09	.10	n/s	n/s	-.17	n/s
2 Collective Act	-.28	1	-.32	-.09	.08	-.13	n/s	-.13	n/s	.06	.06
3 Accessibility	n/s	-.34	1	.10	n/s	n/s	-.06	.21	n/s	n/s	n/s
4 Human Res	-.04	-.15	.18	1	.36	-.12	-.17	.50	.21	.08	-.04
5 PYD	.07	-.06	.13	.26	1	-.40	-.38	.24	.39	n/s	-.06
6 Risk Behavior	.18	n/s	-.12	-.07	-.34	1	.23	-.07	-.24	n/s	.11
7 Depression	.07	.06	-.12	-.11	-.35	.21	1	-.14	-.10	n/s	n/s
8 Income	.11	-.30	.35	.54	.22	-.05	-.17	1	.13	-.06	-.09
9 SOC	.06	-.10	.08	.12	.35	-.22	-.13	.13	1	n/s	-.06
10 Activity Inv.	-.08	n/s	.05	.11	n/s	n/s	n/s	.05	.05	1	.67
11 Activity Inv Sq.	n/s	n/s	n/s	n/s	-.05	n/s	n/s	-.09	.05	.57	1

Note: All correlations are significant unless otherwise specified.
Correlations for male participants (n=271) are in the lower triangle portion of the matrix, and correlations for female participants (n=274) are in the upper triangle portion of the matrix.

Table 3. Means, Standard Deviations, and Ranges for Per Capita Family Income, SOC, Activity Involvement, and Neighborhood Assets at Grade 5 and PYD, Risk Behavior, and Depression at Grade 7

Variable	Mean	Standard Deviation	Range
Per Capita Family Income	12340.93	8708.19	833-50000
SOC	.72	.20	0 - 1
Activity Involvement	.85	.66	0 - 5.76
Physical Resources	.07	.67	-1.14 - 2.60
Collective Activity	.03	.57	-.66 - 1.76
Accessibility	.14	.66	-1.74 - 3.04
Human Resources	.06	.67	-1.91 - 1.55
PYD	74.58	10.65	32.75 - 100
Risk Behavior	2.55	3.24	0 - 22.86
Depression	14.04	10.07	0 - 51

Table 4. Parameter estimates, *p* values, associated goodness-of-fit statistics, and effect sizes for regression models that describe the relationship for boys and girls by neighborhood asset between PYD, intentional self regulation, and activity involvement, controlling for income

	Physical Resources		Collective Activity		Accessibility		Human Resources	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Intercept	49.02*	53.65*	44.70*	53.37*	55.73*	61.63*	52.23*	60.23*
SOC	18.75*	10.33*	32.52*	17.15*	18.38*	10.74*	25.67*	13.27*
Income	11.72*	16.25*	5.41	13.69*	5.12	7.41*	3.50	9.75*
Activity Involvement	-4.98*	-2.87	-17.92*	3.72	-4.19*	-10.21*	-17.97*	-6.26*
Activity Involvement^2	-3.59	2.42	-51.88*	-7.20*	-3.27	4.10*	-13.19*	-2.16*
Activity x SOC	5.89*	4.23	23.06*	-5.46	5.60*	14.15*	23.42*	8.35*
Activity^2 x SOC	3.81	-5.03*	68.59*	11.38*	3.24	-7.71*	15.17*	2.72
δ_μ^2	13.82	12.11	12.22	9.12	49.48	22.41	37.93	23.08
δ_r^2	88.55	79.21	88.63	71.63	80.87	72.75	81.87	61.69
ll (df)	-5723.08(6)	-4915.25(6)	-3930.85(6)	-3798.79(6)	-5743.90(6)	-5470.90(6)	-5467.96(6)	-5659.04(6)
Change in -2 LL	17.14*	11.24*	101.66*	38.80*	14.84*	36.06*	69.20*	52.82*
Effect Size								
SOC	0.34	0.21	0.57	0.37	0.34	0.23	0.45	0.28
Income	0.12	0.16		0.15		0.07		0.08
Activity Involv	-0.29		-0.81		-0.26	-0.72	-0.90	-0.44
Activity Involv^2			-1.91	-0.80		0.85	-0.54	-0.28
Activity x SOC	0.27		0.77		0.28	0.68	0.91	0.45
Activity^2 x SOC		-0.32	1.96	0.87		-0.78	.50	

Note. * $p < .05$.

Table 5. Parameter estimates, *p* values, associated goodness-of-fit statistics, and effect sizes for regression models that describe the relationship for boys and girls by neighborhood asset between risk behaviors, intentional self regulation, and activity involvement, controlling for income

	Physical Resources		Collective Activity		Accessibility		Human Resources	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Intercept	9.88*	7.13*	6.18*	6.99*	5.96*	6.43*	4.59*	3.69*
SOC	-4.88*	-2.26*	-3.47*	-2.33*	-5.22*	-2.87*	-5.10*	-1.95*
Income	-3.27*	-3.80*	-1.10	-3.90*	-.15	-2.55*	1.74	-.52
Activity Involvement	-.15	2.23*	-.85	-1.63*	.36	1.17	1.35	2.80*
Activity Involvement^2	.47	-1.11	4.52*	1.32*	.83	-.85*	1.91	-1.02*
Activity x SOC	.32	-3.01*	1.97	2.54*	.27	-1.38	-.53	-3.42*
Activity^2 x SOC	-.50	2.46*	-6.04*	-1.60*	-.99	1.96	-2.24	1.85*
δ_μ^2	2.23	1.51	2.13	1.23	2.26	2.22	2.06	1.68
δ_r^2	11.59	9.16	7.47	5.62	9.60	9.03	9.51	7.31
ll (df)	-4145.91(6)	-3456.39(6)	-2617.50(6)	-2453.53(6)	-4056.21(6)	-3880.54(6)	-3848.86(6)	-3935.54(6)
Change in -2 LL	3.62	12.62*	14.46*	12.42*	4.84	16.64*	6.74*	16.12*
Effect Size								
SOC	-0.25	-0.14	-0.21	-0.19	-0.29	-0.18	-0.28	-0.13
Income	-0.10	-0.12		-0.16		-0.08		
Activity Involv		0.42		-0.40				0.61
Activity Involv^2			0.58	0.56		-0.53		-0.41
Activity x SOC				0.48				-0.56
Activity^2 x SOC		0.49	-0.60	-0.47				0.47

Note. * $p < .05$.

Table 6. Parameter estimates, *p* values, associated goodness-of-fit statistics, and effect sizes for regression models that describe the relationship for boys and girls by neighborhood asset between depressive symptoms, intentional self regulation, and activity involvement, controlling for income

	Physical Resources		Collective Activity		Accessibility		Human Resources	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
Intercept	30.45*	11.49*	21.79*	21.25*	24.69*	16.09*	24.26*	24.27*
SOC	-8.63*	1.57	-6.55*	-2.67	-7.97*	-3.94*	-4.69*	-7.76*
Income	-11.72*	2.40	-2.53	-4.18	-6.75*	2.06	-8.32*	-4.95
Activity Involvement	1.57	11.82*	3.55	3.64	-.28	4.11*	3.42	-9.89*
Activity Involvement^2	-.04	-8.62*	2.18	1.00	.95	-1.53	-16.63*	6.00*
Activity x SOC	-2.91	-13.34*	-5.72	-3.62	2.22	-4.30	-3.46	11.79*
Activity^2 x SOC	.05	12.99*	-4.03	-2.00	-1.65	2.83	20.70*	-7.83*
δ_μ^2	7.87	38.56	11.89	20.41	16.88	37.12	14.98	48.60
δ_r^2	90.19	97.91	95.06	89.83	78.37	74.95	82.50	70.07
ll (df)	-5732.80(6)	-5067.88(6)	-3967.56(6)	-3922.83(6)	-5707.90(6)	-5499.20(6)	-5462.85(6)	-5770.94(6)
Change in -2 LL	8.4*	28.74*	13.02*	11.94*	8.2*	9.3*	25.22*	30.34*
Effect Size								
SOC	-0.17		-0.12		-0.16	-0.09	-0.09	-0.16
Income	-0.13				-0.07		-0.07	
Activity Involv		0.68				0.31		-0.69
Activity Involv^2		-0.78					-0.74	0.77
Activity x SOC		-0.57						0.62
Activity^2 x SOC		0.79					0.75	-0.63

Note. * $p < .05$.

Figure Captions

Figure 1. Grade 7 PYD predicted by Grade 5 activity involvement and intentional self regulation for boys living in lower human resource neighborhoods.

Figure 2. Grade 7 PYD predicted by Grade 5 activity involvement and intentional self regulation for girls living in lower human resource neighborhoods.

Figure 3. Grade 7 PYD predicted by Grade 5 activity involvement and intentional self regulation for boys living in lower accessibility neighborhoods.

Figure 4. Grade 7 PYD predicted by Grade 5 activity involvement and intentional self regulation for boys living in lower physical resource neighborhoods.

Figure 5. Grade 7 PYD predicted by Grade 5 activity involvement and intentional self regulation for boys living in lower collective activity neighborhoods.

Figure 6. Grade 7 PYD predicted by Grade 5 activity involvement and intentional self regulation for girls living in lower accessibility neighborhoods.

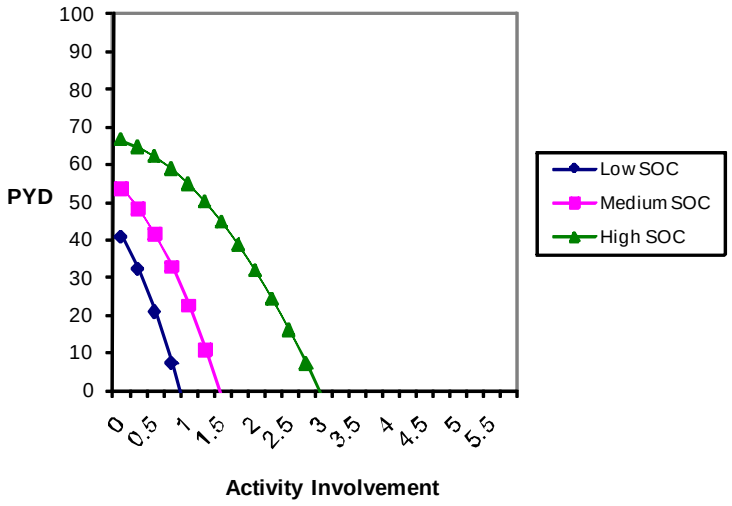
Figure 7. Grade 7 risk behaviors predicted by Grade 5 activity involvement and intentional self regulation for girls living in lower collective activity neighborhoods.

Figure 8. Grade 7 risk behaviors predicted by Grade 5 activity involvement and intentional self regulation for girls living in lower physical resource neighborhoods.

Figure 9. Grade 7 risk behaviors predicted by Grade 5 activity involvement and intentional self regulation for girls living in lower human resources neighborhoods.

Figure 10. Grade 7 depressive symptoms predicted by Grade 5 activity involvement and intentional self regulation for girls living in lower physical resources neighborhoods.

Figure 11. Grade 7 depressive symptoms predicted by Grade 5 activity involvement and intentional self regulation for girls living in lower human resources neighborhoods.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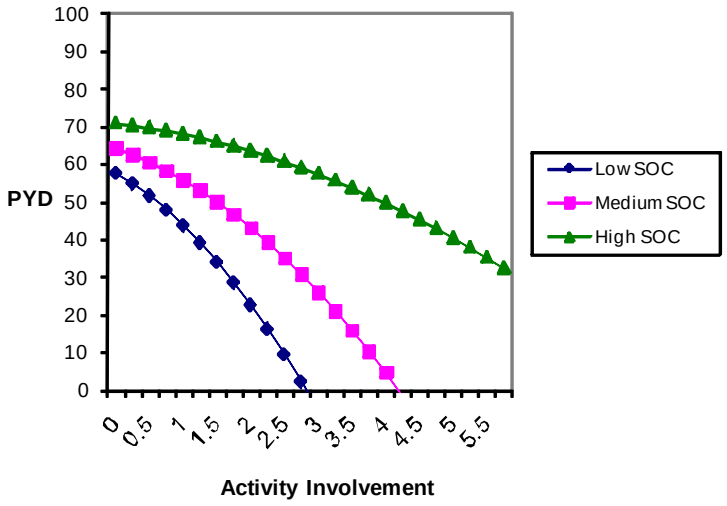
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 1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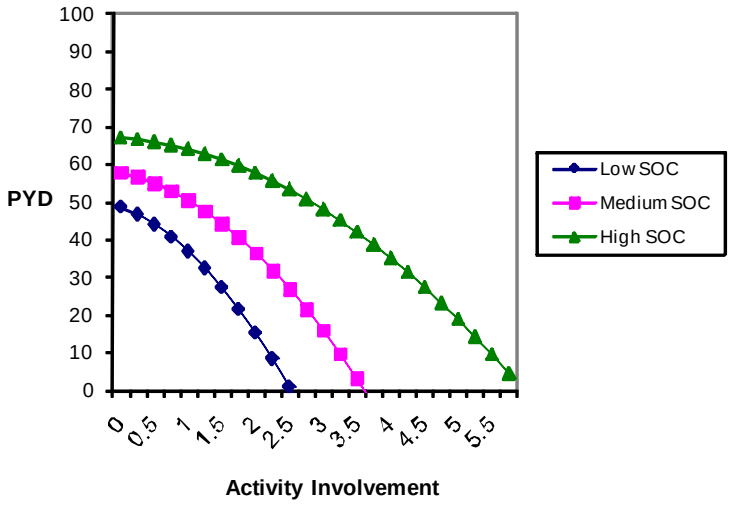
Medium SOC
High SOC

Figure 2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Activity Involvement
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Medium SOC
High SOC

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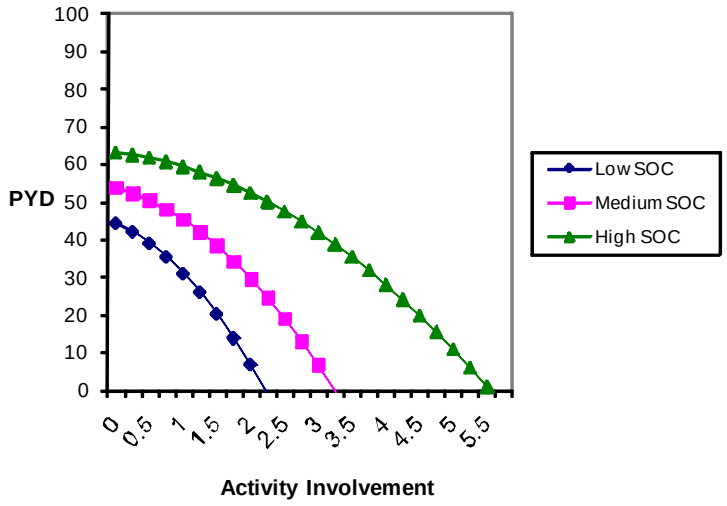
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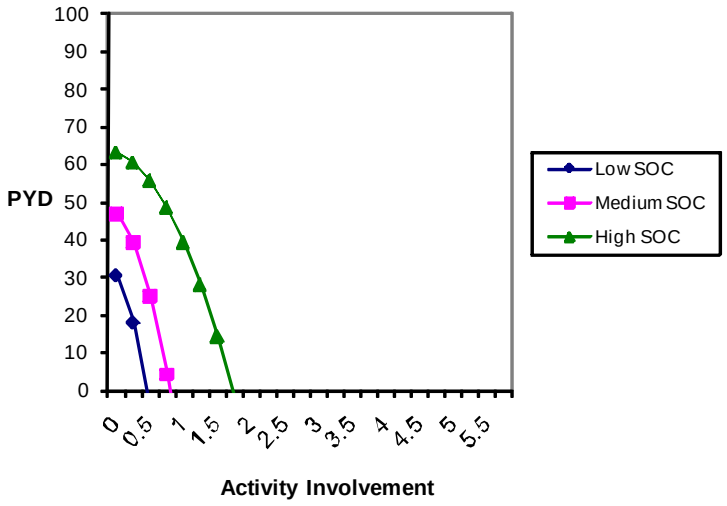
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 4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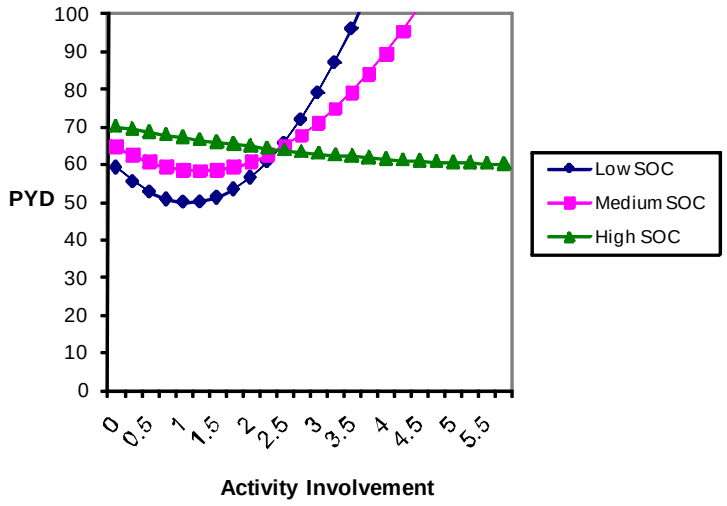
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 5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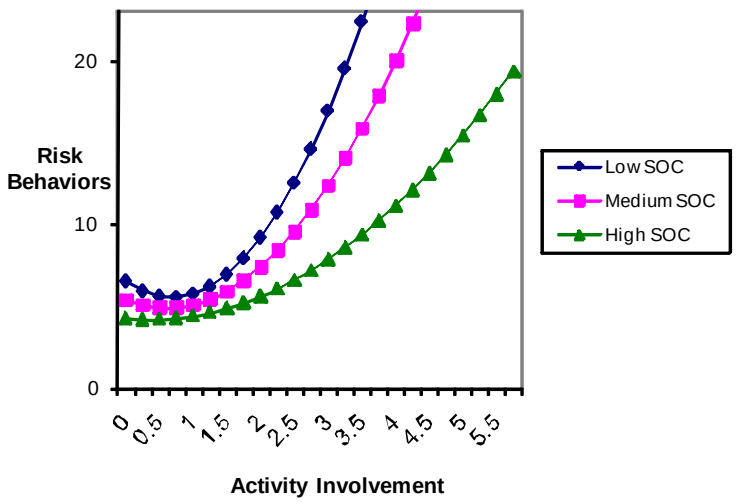
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 6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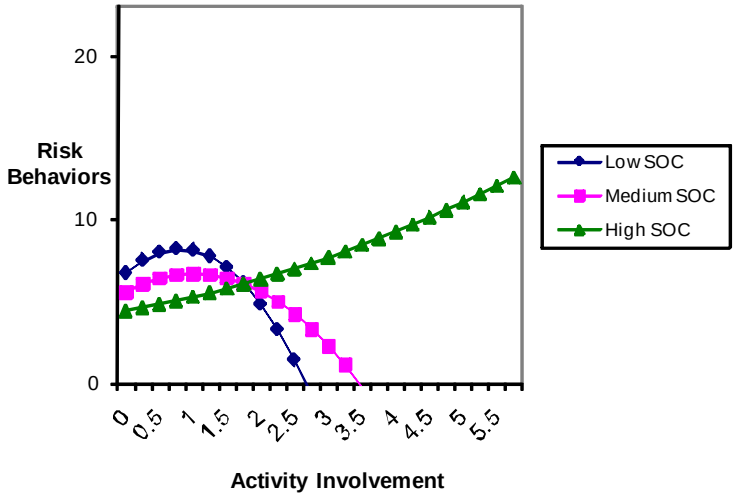
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 7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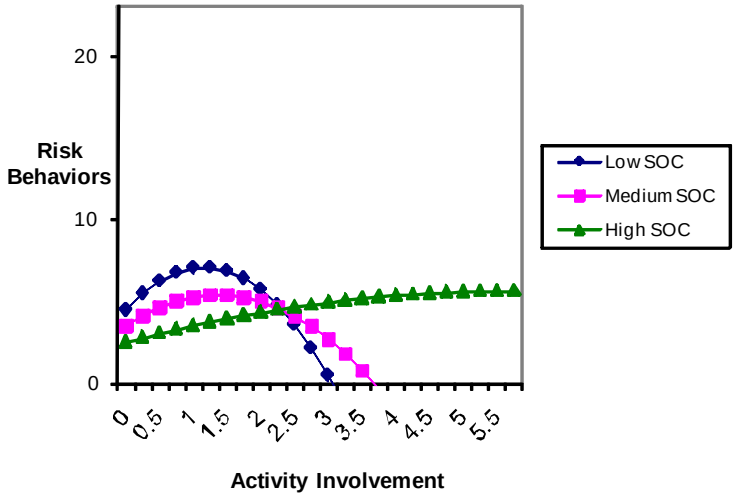
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 8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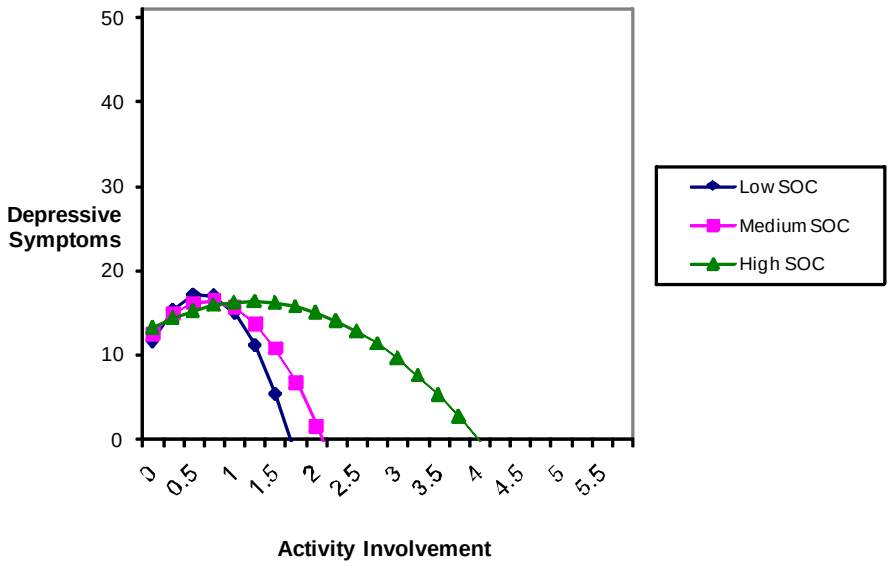
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 9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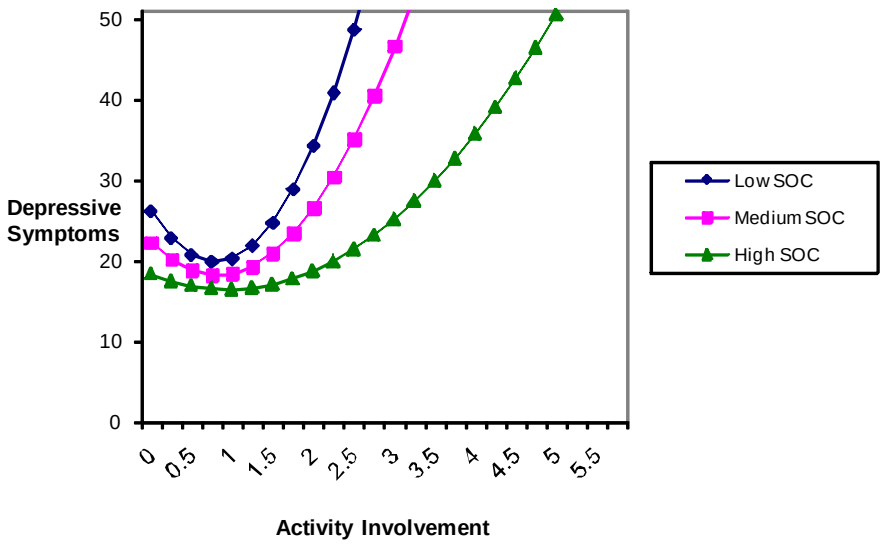
Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 10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Activity Involvement
Low SOC
Medium SOC
High SOC

Figure 11