

The role of ecodevelopmental context and self-concept in depressive and externalizing symptoms in Hispanic adolescents

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The present study examined the extent to which self-concept is related to depressive and externalizing symptoms in Hispanic adolescents, in the presence of contextual variables. A sample of 167 Hispanic adolescents and their primary caregivers completed measures of family functioning, and of school bonding and competence. Adolescents completed measures of self-concept and peer antisocial behavior. Reports of depressive symptoms were gathered from adolescents only, whereas reports of externalizing symptoms were gathered from both adolescents and parents. Self-concept was directly and negatively related to adolescent reports of both depressive and externalizing symptoms, but not to parent reports of externalizing problems. The relationships of school bonding and peer antisocial behavior to adolescent-reported adjustment appeared to operate through self-concept, and the strong bivariate relationships of adolescent-reported family functioning to adolescent-reported adjustment appeared to operate through school bonding and self-concept. Implications for further research and for intervention are discussed.

Keywords: depression; externalizing; Hispanic; self-concept; social context

Adolescence is the life stage when youth begin to develop a stronger sense of self and to direct their own lives and behaviors based on their beliefs about themselves (Erikson, 1950; Harter, 1999). Contextual domains such as family and school continue to exert strong influences on adolescent development (Grotevant & Cooper, 1986; Maddox & Prinz, 2003), and the peer domain becomes increasingly salient in adolescence (Levitt, Guacci-Franco, & Levitt, 1993). Adolescence is also a time when rates of both depressive and externalizing (e.g., aggression, delinquency) symptoms increase over childhood levels, although the timing and severity of these increases often vary by gender (Birmaher, Arbelaez, & Brent, 2002; Brame, Nagin, & Tremblay, 2001). These trajectories of depressive and externalizing symptoms may be related, although the variables that predict these trajectories are often different (Fergusson & Woodward, 2002; Reitz, Deković, & Meijer, 2005).

There is empirical literature demonstrating that adolescent depressive and externalizing symptoms are related both to the adolescent's view of her/himself (e.g., Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005) and to contextual factors such as family, school, and peers (e.g., Grills & Ollendick, 2002; Vitaro, Brendgen, & Tremblay, 2000). To understand the multi-determined etiology, course, and malleability of depressive and externalizing symptoms, investigators are, with increasing frequency, relying on developmental-ecological

frameworks. One of these frameworks is ecodevelopmental theory (Szapocznik & Coatsworth, 1999), which postulates that a full understanding of adolescent depressive and externalizing symptoms must include careful consideration of the social systems in which development occurs (cf. Bronfenbrenner, 1979). The most proximal of these social systems are *microsystems*, which refer to the specific contexts in which adolescents function (e.g., family, peers, school).

Ecodevelopmental theory grew out of attempts to integrate structural family systems theories (e.g., Haley, 1976; Minuchin, 1974) with a more expansive ecological focus on risk and protective factors (cf. Hawkins, Catalano, & Miller, 1992). It was developed to map and integrate disparate sources of risk and protection in the social environment (Szapocznik & Coatsworth, 1999). Ecodevelopmental theory consists of three interrelated components: (a) A social-ecological perspective focusing on contextual domains such as family, peers, and school; (b) a developmental perspective examining changes in individuals and their contexts over time; and (c) a social-interactional perspective highlighting ways in which various ecological processes transact to produce behavioral and psychosocial outcomes (Szapocznik & Coatsworth, 1999). Ecodevelopmental theory draws on, but is not synonymous with, Bronfenbrenner's social-ecological perspective. Specifically, ecodevelopmental theory adds to social-ecological theory

by focusing on the ways in which systems influence one another, and on the ways in which these sequences of influence affect developmental outcomes.

Research on microsystem-level functioning and adolescent problems has yielded findings consistent with ecodevelopmental theory. For example, low parental support and high parent-adolescent conflict are predictive of adolescent depressive symptoms (Jenkins, Goodness, & Buhrmester, 2002). Similarly, adolescent externalizing problems are related to harsh and unsupportive parenting practices (Pettit, Bates, & Dodge, 1997), poor family communication (Loeber, Farrington, Stouthamer-Loeber, & Van Kammen, 1998), and insufficient parental involvement (Olson, Bates, Sandy, & Lanthier, 2000). Within the peer domain, lack of peer support may be associated with both depressive and externalizing symptoms (Lopez & DuBois, 2005), and association with antisocial peers is a strong predictor of externalizing symptoms in adolescence (Vitaro et al., 2000). Within the school domain, poor school bonding and adjustment have been shown to be related to externalizing symptoms, but not to depressive symptoms (Aunola, Stattin, & Nurmi, 2000).

Although ecodevelopmental theory provides a comprehensive view of the ecological correlates and determinants of adolescent problems, it has been suggested that ecodevelopmental theory might benefit from the inclusion of intrapersonal variables (e.g., Locke, Newcomb, & Goodyear, 2005; Newcomb, Locke, & Goodyear, 2003). Given the importance of a coherent and integrated sense of self as a positive developmental process in classic psychological theory (e.g., Erikson, 1950), and given the growing literature on aspects of self as important dimensions of positive functioning (e.g., Schwartz, 2005), it may be important to include, within ecodevelopmental theory, the adolescent's view of her- or himself as an additional protective factor against depressive and externalizing symptoms. In fact, Locke et al. (2005) and Newcomb et al. (2003) have referred to intrapersonal variables as the "internal microsystem". Bringing together ecological and intrapersonal perspectives on adolescent problems may result in a more extensive and overarching understanding of the levels and variables associated with these problems (cf. Dodge & Pettit, 2003). Moreover, given that Bronfenbrenner's (1979) social-ecological perspective incorporated intrapersonal as well as ecological variables, it is important to advance the simultaneous study of intrapersonal and ecological variables as correlates of adolescent adjustment.

The role of the self in the relationship between context and behavior

The role of the self in the relationship between context and behavior is an important developmental issue (Dodge & Pettit, 2003; Schwartz, Pantin, Prado, Sullivan, & Szapocznik, 2005). During adolescence, cognitive and perspective-taking abilities advance considerably (Lerner & Steinberg, 2004) and allow individuals to reflect on themselves. Specifically, when the person is not an active participant in her/his exchanges with the social context, the self would be expected to overlap with context in relationship to indices of adjustment. On the other hand, to the extent that the individual participates actively in exchanges with the social environment, it may be reasonable to expect that the self would explain variability in adjustment that is not explained by contextual variables (cf. Lerner,

Freund, DeStefanis, & Habermas, 2001). In both cases, the relationship of contextual variables to adjustment indices may operate through aspects of self; however, in cases where the self is differentiated from context, it may *both* mediate the relationships of contextual variables to adjustment *and* relate to adjustment beyond the contributions of contextual variables.

Self-concept, the adolescent's view of him/herself, may be a particularly important predictor of adolescent behavior because it entails the ways in which the adolescent perceives her/his own actions (cf. Harter, 1999). The self-representations of adolescents have a clear developmental organizational function, serving to interpret and give meaning to experiences, regulate affect, and motivate and guide behavior (Harter, Bresnick, Bouchey, & Whitesell, 1997). Harter (1999), for example, has adopted a phenomenological perspective in which adolescents' perceptions of themselves are posited to exert unique effects on their developmental and behavioral outcomes. The behaviors guided by these self-representations may be either socially appropriate or not (e.g. delinquency, depression; Harter, 1999). In general, Harter (1993) proposes that youth who maintain positive self-concepts are more likely to navigate smoothly through adolescence than are youth whose self-concepts are more negative or fragile. The question remains open, however, as to whether this is true when the effects of contextual variables are also considered.

The role of self-concept in adolescent depressive and externalizing symptoms has been less widely studied than has the role of contextual factors. Within this literature, it has been found that self-concept is inversely related to anxiety (Grills & Ollendick, 2002) and depression (Harter & Whitesell, 1996). Moreover, there is evidence that low self-concept may be related to externalizing symptoms (Donnellan et al., 2005). Therefore, given Harter's phenomenological assumption that children's self-perceptions are uniquely predictive of their developmental and behavioral outcomes, it might be reasonable to hypothesize that adolescent self-concept would be significantly related to depressive and externalizing symptoms over and above what is explained by contextual factors.

It is also likely that some interplay between self-concept and contextual variables occurs in relation to depressive and externalizing symptoms. Self-concept would be expected to be most closely related to depressive symptoms (cf. Harter, 1999), because both self-concept and depressive symptoms represent intrapersonal variables. The contributions of contextual variables to depressive symptoms might therefore operate through self-concept. For example, a poor school environment might negatively impact an adolescent's self-concept and thereby increase depressive symptoms. On the other hand, some studies have found that the relationships of self-perceptions to externalizing symptoms are significant, negative, and strong at the bivariate level but are attenuated when contextual variables are taken into account (Henderson, Dakof, Schwartz, & Liddle, in press; Schwartz et al., 2005). This might suggest, then, that the relationship of self-concept to externalizing symptoms would be shared, at least in part, with contextual variables, although we also expect that self-concept will explain some variability in externalizing problems that is not shared with contextual variables.

A model in which self-concept mediates the relationships of contextual variables to self-concept is consistent with Dodge and Pettit (2003), who argue that the effects of context on behavior and psychosocial functioning operates through

interpersonal variables. A model with the relationships of self-concept to psychosocial functioning mediated by contextual variables may seem counterintuitive, given that self-concept is assumed to be shaped and molded by contextual influences (Guay, Marsh, & Boivin, 2003; Prinstein, Cheah, & Guyer, 2005). However, it is also plausible that self-concept relates to adolescent adjustment by influencing *perceptions* of context such as perceived quality of family interactions, perceived peer support or antisocial behavior, or bonding to school. These two sets of expectations can be tested through positing models with different “causal flow” – such as one model in which self-concept mediates the relationships of contextual variables to adjustment indices, and a second model in which the relationships of self-concept to adjustment indices operate through contextual variables.

It may also be useful to develop theoretical expectations regarding specific aspects of context with which the relationships of self-concept to depressive and externalizing symptoms might be shared. Variables in the family (e.g., cohesion, communication, parenting quality), school (e.g., school bonding), and peer (e.g., peer support, peer antisocial behavior) contexts have been found to be related both to self-perceptions (Guay et al., 2003; Harter, Stocker, & Robinson, 1996) and to depressive and adolescent externalizing symptoms (Pettit, Clawson, Dodge, & Bates, 1996; Vitaro et al., 2000). It might therefore be anticipated that some of the relationship of self-concept to depressive and externalizing symptoms would be shared with these specific contextual variables.

The current study

The present study was conducted with a Hispanic sample. Research on Hispanic adolescents is important given the size and growth rate of this population. Hispanics are currently the largest minority group in the United States, comprising 13% of the U.S. population (Ramirez & de la Cruz, 2003). The U.S. Hispanic population grew by 58% during the 1990s (Marotta & Garcia, 2003) and is expected to make up a quarter of the U.S. population by 2050 (Day, 1996). Hispanics are also a youthful ethnic group, with more than one-third under the age of 18 (Ramirez & de la Cruz, 2003). Hispanics are also over-represented among delinquent (Snyder & Sickmund, 1999) and drug-using (Johnston, O'Malley, & Bachman, 1996) adolescents. This overrepresentation, combined with the size and growth rate of the Hispanic population, suggests that identifying mechanisms associated with problematic outcomes in this population is an important public health concern. Comorbidity between depressive symptoms and externalizing problems (Reitz et al., 2005) argues for consideration of depressive as well as externalizing symptoms.

The present study was guided by two related objectives. The first objective was to determine whether, in Hispanic adolescents, self-concept explains additional variability in adolescent depressive and externalizing symptoms beyond what is accounted for by contextual variables. The second objective was to explore the two mediation models with different “causal flow” outlined earlier. In the present study, we hypothesized that (a) self-concept would account for significant additional variance in depressive and externalizing symptoms, over and above that accounted for by contextual variables; (b) self-concept would partially mediate the relationships of contextual variables to adolescent depressive

symptoms; and (c) contextual variables would partially mediate the relationship of self-concept to externalizing symptoms. The present study was exploratory in that it was one of the first investigations to include both aspects of self and aspects of context as correlates of adolescent depressive and externalizing symptoms. Although other studies have examined aspects of self and aspects of context as correlates of externalizing behavior (e.g., Arbona, Jackson, McCoy, & Blakely, 1999; Henderson et al., in press; Schwartz et al., 2005), we extend this literature by (a) examining self and context as correlates of both internalizing and externalizing problems; (b) utilizing both adolescent and parent reports; and (c) studying an exclusively Hispanic sample. Further, although Newcomb and colleagues (Locke et al., 2005; Newcomb et al., 2003) have examined both intrapersonal and contextual factors in relation to sexual risk taking in Hispanics, their operationalization of the “internal microsystem” did not include self-perceptions.

Method

Design

A cross-sectional design was used to test the relationships of ecodevelopmental variables and of self-concept to adolescent depressive and externalizing symptoms. Data for the present study were drawn from a randomized clinical trial testing a problem-behavior preventive intervention with minority adolescents (Coatsworth, Pantin, & Szapocznik, 2002; Pantin, Coatsworth, et al., 2003). Data from the baseline assessment for the prevention trial were used for the present analyses. Participating adolescents were selected based on ecodesvelopmental risks associated with immigration and with residing in impoverished inner-city neighborhoods. Concerns about or clinical levels of depression or externalizing symptoms were not among the selection or inclusion criteria used in the larger trial.

Participants and procedures

The sample for this study consisted of 167 Hispanic adolescents (61% boys; *M* age 12.39 years, *SD* = 0.80, range 10–14 years) and their primary caregivers. This sample represents 35% of families initially contacted and 51% of families indicating interest in participating in the larger study from which the present data were drawn (see Pantin, Coatsworth, et al., 2003, for more detail on participant recruitment). Ninety per cent (*n* = 150) of participating caregivers were mothers, with the remainder being fathers (*n* = 12) or grandmothers (*n* = 5). The sample was low income, with 75% of families reporting annual household incomes of less than \$25,000. Sixty-three per cent (*n* = 105) of participating caregivers had completed high school.

Forty-nine per cent (*n* = 82) of the adolescents, and 94% of the parents, were immigrants. The most common countries of origin for immigrant Hispanic families were Cuba (38%) and Nicaragua (20%). Immigrant Hispanic parents had resided in the United States for a mean of 14.1 years (*SD* = 10.3), and immigrant Hispanic adolescents had resided in the United States for a mean of 5.7 years (*SD* = 3.8).

This study was approved by a University Institutional Review Board for the Protection of Human Subjects. Adolescents and their parents signed assent and consent forms, respectively.

Recruitment and baseline assessments occurred in the Fall and Winter of a single academic year. Families were recruited from inner-city middle schools in Miami. Adolescents were sent home with hand-outs describing the study and asking parents to contact the investigators if they were interested in participating. Additional recruitment efforts were initiated at parent-school functions and by school personnel.

The measures reported in this article were part of a larger assessment battery administered to participants. The majority of parents (62.9%) completed their assessments in Spanish, whereas the majority of adolescent assessments (92.7%) were completed in English. The Spanish versions of the measures used in the present study were established through back translation and committee resolution (see Kurtines & Szapocznik, 1995).

Measures

In the present study, we measured variables within each of the primary adolescent contexts (family, peers, and school), within the domain of adolescent self-concept, and within adolescent depressive and externalizing symptoms. For all domains except for adolescent self-concept and depressive symptoms, we obtained both parent and adolescent reports.

Contextual variables

Family context. Within the family context, we measured cohesion, communication, and parental involvement/positive parenting. Family cohesion and communication were measured using the Family Relations Scale (Tolan, Gorman-Smith, Huesmann, & Zelli, 1997). Parental involvement and positive parenting were measured using the Parenting Practices Scale (Gorman-Smith, Tolan, Zelli, & Huesmann, 1996), which contains separate subscales for parental involvement and positive parenting. See Table 1 for descriptive, validity, and reliability information on these measures and subscales.

School context: Support, bonding and disinterest. Within the school context, we assessed teacher support using adolescent reports, and we assessed school bonding and school disinterest using both adolescent and parent reports. Teacher support was measured using the corresponding subscale from the Social Support Appraisals Scale (Dubow & Ullman, 1989). School bonding and school disinterest were assessed using the corresponding subscales (consisting of 5 and 9 items, respectively) from the School Attitudes/Bonding Scale (Resnicow, 1996). See Table 1 for descriptive, validity, and reliability information on these measures and subscales.

Peer context: Peer support and association with antisocial peers. Within the peer context, we measured peer support and association with antisocial peers using only adolescent reports. Peer support was assessed using the peer support subscale from the Social Support Appraisals Scale. Adolescents' perceptions of their peers' antisocial behavior were assessed using a 13-item self-report instrument, modified from the interview format used by Dishion, Capaldi, Spracklin, and Li (1995). See Table 1 for descriptive, reliability, and validity information.

Self-concept

Self-concept was assessed using the Piers-Harris Children's Self-concept Scale (Piers, 1984). This measure is intended for

individuals between the ages of 10 and 18 (Bracken, Bunch, Keith, & Keith, 2000). Adolescents respond to 52 yes/no questions tapping their perceptions of themselves in four domains: Behavior, academics, popularity with peers, and happiness-satisfaction. Self-concept was assessed in the domains of behavior, academics, happiness, and popularity (see Table 1 for descriptive, reliability, and validity information). Scores from the Piers-Harris Self-concept Scale have been shown to converge with those from other self-concept measures (Bracken et al., 2000).¹

Adolescent depressive and externalizing symptoms

Depressive symptoms. Adolescent depressive symptoms were assessed using adolescent reports ($\alpha = .76$) on the 20-item Center for Epidemiological Studies Child Depression Scale (Radloff, 1977; see Table 1). We did not analyze parent reports of depressive symptoms. The item-mean depressive symptoms scores for boys (0.48) and girls (0.54) in the present sample were similar to the mean scores from the Add Health national probability sample (0.43; Wight, Sepulveda, & Aneshensel, 2004) and were lower than those from various Hispanic nationalities sampled in the Children of Immigrants Longitudinal Study (Portes & Zady, 2001).

Externalizing symptoms. Externalizing symptoms were assessed using several indicators, to capture the multidimensionality of adolescent externalizing symptoms. In the present study, externalizing symptoms were operationalized as aggression, delinquency, and attention problems (cf. Achenbach, Dumenci, & Rescorla, 2002). Adolescent reports of externalizing symptoms were gathered using the hyperactivity, impulsivity, and anger control subscales from an adapted version of the Conners-Wells Adolescent Self-Report Scale (Conners et al., 1997), as well as the aggression subscale from the Behavior Scale Part I (Resnicow, 1997). Parent reports of adolescent externalizing symptoms were gathered using the conduct disorder, socialized aggression, and attention problems subscales from the Revised Behavior Problem Checklist (Quay & Peterson, 1987). Although the socialized aggression subscale measures delinquency in the company of peers and may be thought of as conceptually similar to peer antisocial behavior, the socialized aggression subscale measures the adolescent's own behavior in the company of peers. Additionally, scores on this subscale have been found to be closely related to parent reports of conduct problems in prior research (Schwartz et al., 2005). Moreover, in the present study, socialized aggression scores were not significantly related to adolescent reports of peer antisocial behavior ($r = .11$). As a result, socialized aggression was considered as a parent-report indicator of adolescent behavior problems rather than of peer behavior.

The Revised Behavior Problem Checklist includes norms for both clinical and nonclinical samples (Quay & Peterson, 1987). The means from the present sample are comparable to the norms for nonclinical, non-Hispanic samples and are

¹ Because the happiness subscale is conceptually and empirically ($r = .38$) similar to the depressive symptoms measure used as a dependent variable in the present study, we conducted the study analyses using both (a) the summed self-concept score including all four subscales, and (b) a summed self-concept score without the happiness subscale. Results were nearly identical between the two sets of analyses. As a result, the happiness subscale was included in the analysis.

Table 1
Descriptive statistics, reliability, and validity information for study variables

Construct	Measure/subscale	Citation	No. of items ^a	Mean (SD) ^{b,c}	Cronbach's α	Validity citations
<i>Family Context</i>						
Family Cohesion (A, P)	Family Relations Scale	Tolan et al. (1997)	35; 6	3.35 (0.50); 3.62 (0.40)	A .80; P .74	Tolan et al. (1997)
Family Communication (A, P)	Family Relations Scale	Tolan et al. (1997)	35; 3	3.22 (0.58); 3.45 (0.52)	A .60; P .54	Tolan et al. (1997)
Parental Involvement (A, P)	Parenting Practices Scale	Gorman-Smith et al. (1996)	A 25, P 36; 12	3.92 (0.67); 4.33 (0.46)	A .80; P .75	Gorman-Smith et al. (1996)
Positive Parenting (A, P)	Parenting Practices Scale	Gorman-Smith et al. (1996)	A 25, P 36; 12	3.99 (0.71), 4.11 (0.70)	A .81; P .75	Gorman-Smith et al. (1996)
<i>School Context</i>						
Teacher Support (A)	Social Support Appraisals Scale	Dubow and Ullman (1989)	35; 5	3.90 (0.77)	.72	Dubow et al. (1997)
School Bonding (A, P)	School Attitudes/Bonding Scale	Resnicow (1996)	35; 5	3.06 (0.40), 3.22 (0.43)	A .77; P .66	Pantin, Coatsworth, et al. (2003)
School Disinterest (A, P)	School Attitudes/Bonding Scale	Resnicow (1996)	35; 9	1.81 (0.42), 1.59 (0.44)	A .65; P .72	Pantin, Coatsworth, et al. (2003)
<i>Peer Context</i>						
Peer Support (A)	Social Support Appraisals Scale	Dubow and Ullman (1989)	35; 14	4.19 (0.55)	.85	Dubow et al. (1997)
Peer Antisocial Behavior (A)	Adaptation of interview	Dishion et al. (1995)	13; 13	1.30 (0.56)	.86	Dishion et al. (1995)
<i>Self-concept</i>						
Self-concept (A)	Piers-Harris Self-concept Scale for Children	Piers (1984)	52; 16	5.54 (4.03)	.77	Bracken et al. (2000)
Behavior			52; 17	4.65 (4.13)	.73	
Academics			52; 10	9.38 (3.83)	.63	
Happiness			52; 13	6.18 (4.62)	.67	
Popularity						
<i>Depressive Symptoms</i>						
Depressive Symptoms (A)	Center for Epidemiologic Studies Depression Scale	Radloff (1977)	20; 20	1.50 (2.01)	.76	Burt et al. (2005); Francoeur (2005); Keller and Nesse (2005)
<i>Externalizing Symptoms</i>						
Hyperactivity (A)	Conners-Wells Adolescent Self-Report Scale	Conners et al. (1997)	87; 10	1.90 (1.52)	.85	Hardoon, Gupta, and Deverenski (2004)
Impulsivity (A)	Conners-Wells Adolescent Self-Report Scale	Conners et al. (1997)	87; 5	1.86 (1.17)	.75	Steer, Kumar, and Beck (2001)
Anger Control (A)	Conners-Wells Adolescent Self-Report Scale	Conners et al. (1997)	87; 7	1.81 (1.01)	.74	Hardoon et al. (2004)
Aggression (A)	Behavior Scale Part I	Resnicow (1997)	87; 12	1.07 (0.38)	.83	Steer et al. (2001)
Conduct Disorder (P)	Revised Behavior Problem Checklist	Quay and Peterson (1987)	89; 22	1.34 (2.04)	.95	Resnicow et al. (1995)
Socialized Aggression (P)	Revised Behavior Problem Checklist	Quay and Peterson (1987)	89; 16	1.13 (1.50)	.97	Cullinan, Harniss, Epstein, and Ryser (2001)
Attention Problems (P)	Revised Behavior Problem Checklist	Quay and Peterson (1987)	89; 16	1.41 (1.82)	.94	Cullinan et al. (2001)

Note. (A) = adolescent report; (P) = parent report.

^a Numbers before the semicolon refer to the number of items on the complete measure; numbers after the semicolon refer to the number of items on the subscale.

^b In cases where two sets of descriptive statistics are listed, the first set is for adolescent reports and the second set is for parent reports.

^c Uses a 5-point scale.

lower than the means for clinical Hispanic and clinical non-Hispanic samples reported in Rio, Quay, Santisteban, and Szapocznik (1989). These comparisons are qualified with the recognition that comparisons across ethnic groups, and even across subgroups within a single ethnic group, are vulnerable to a host of potential methodological and cultural confounds.

Analytic procedures

Structural equation modeling (SEM), conducted with AMOS 5.0, was used to test the study hypotheses. SEM was used because it corrects for measurement error and can estimate both direct and indirect (mediated) effects simultaneously. Constructs were represented with item-parcels (i.e., sums of items), with parcels created randomly (Bandalos & Finney, 2001). The use of parcels is considered acceptable as long as the indicators represent a single dimension and are closely related to one another (Little, Cunningham, Shahar, & Widaman, 2002). To provide maximal correction for unreliability in self-concept, we used all four subscales to create a latent self-concept variable.

We also sought to correct for unreliability in depressive symptoms scores despite using only one indicator to represent this construct. When a construct is measured using only one indicator, Keith (2006) recommends correcting for unreliability by estimating the variance of the error term as the variance of the indicator multiplied by one minus the Cronbach's alpha estimate (α for depressive symptoms was .76, so $1 - \alpha = .24$). We therefore constrained the variance of the error term for depressive symptoms to be .24 times $(2.01)^2$, or .969624.

Although our objective was to attach the indicators within each sphere of influence to a single latent variable, prior research (as well as modest correlations in the present sample) suggested that multiple latent variables were needed to represent family functioning, peer variables, and externalizing symptoms. With regard to family functioning, prior research with general-population (Tein, Roosa, & Michaels, 1994) and Hispanic (Schwartz et al., 2005) samples has indicated that parent and adolescent reports of family functioning do not correlate highly with one another. In the peer domain, because peer support and peer antisocial behavior represent separate constructs (i.e., positive and negative peer influences), we retained the two separate observed indicators rather than combining them into a latent variable. With regard to externalizing symptoms, prior research suggests that parent and adolescent reports are only weakly intercorrelated (Achenbach et al., 2002). Separate latent variables were therefore created for each reporter. Within each domain (e.g., family functioning) where multiple latent factors were created, we allowed these latent variables to intercorrelate (cf. Newsom, 2002).

We used standard indices and cut-off values to evaluate fit (e.g., NNFI and CFI > .90 and RMSEA < .08; see Kline, 1998). The chi-square index is reported but is not used to evaluate model fit because it is not corrected for model complexity and may therefore be inflated in complex models (Kline, 1998). Reliability for each latent construct was estimated using the formula developed by Fornell and Larcker (1981).

Structural equation models were estimated in three steps. First, we estimated a model in which all measurement models were embedded and in which we included covariance paths among all pairs of constructs. This model served three

purposes: (a) It allowed us to evaluate the adequacy of the measurement models; (b) it served as the "baseline" model against which models with directional paths could be compared; and (c) it allowed us to compute bivariate correlations among the study constructs (see Table 2). Second, we estimated a "contextual-only" SEM model in which directional paths were drawn from contextual correlates to adolescent depressive and externalizing symptoms. Self-concept was allowed to covary with other variables in the model, but no directional paths were drawn to or from self-concept. In this model, significant covariance paths from the bivariate correlations model were incorporated. Residual terms for adolescent-reported internalizing and externalizing were allowed to covary, given previously documented relationships between these types of behaviors (e.g., Brendgen, Vitaro, & Bukowski, 2000). This "contextual-only" model represents the "base model" onto which self-concept could be added to ascertain its contribution to adolescent depressive and externalizing symptoms. Within each of the figures used to represent the models, only significant paths and covariances are represented in the figure.

We then added self-concept to the contextual-only model. We evaluated two different ways of entering self-concept: (a) As a mediator² of the relationships of contextual variables to adolescent psychosocial functioning (cf. Dodge & Pettit, 2003; Schwartz et al., 2005); and (b) with its relationships to adolescent psychosocial functioning mediated by contextual variables (cf. Henderson et al., in press).

Relative fit of the contextual-only model and the self-concept mediation models versus the bivariate correlations model was evaluated using standard indices derived from the measurement invariance literature (see Vandenberg & Lance, 2000, for a review): the difference in chi-square values ($\Delta\chi^2$), the difference in CFI values, and the difference in NNFI values. A significant difference in model fit is represented by a statistically significant $\Delta\chi^2$ value (Byrne, 2001), a Δ CFI value greater than .01 (Cheung & Rensvold, 2002), and a Δ NNFI value greater than .02 (Vandenberg & Lance, 2000).

Results

The confirmatory factor analysis model provided an adequate fit to the data,³ $\chi^2(137) = 282.84$, $p < .001$; CFI = .91; RMSEA = .08. Bivariate correlations from this model are displayed in Table 2. Reliability estimates for the various constructs were: Adolescent-reported family functioning, .89; parent-reported family functioning, .76; school microsystem, .71; self-concept, .73; adolescent-reported externalizing, .75; and parent-reported externalizing, .89.

The contextual-only model provided an adequate fit to the data, $\chi^2(143) = 299.81$, $p < .001$; CFI = .90; RMSEA = .08. The fit of this model was equivalent to that of the bivariate correlations model, $\Delta\chi^2(6) = 16.97$, $p < .01$; Δ CFI = .007; Δ NNFI = .004. The model is depicted in Figure 1. School

² MacKinnon et al. (2002) acknowledge only partial mediation and argue that full mediation does not exist.

³ Within the measurement model for parent-reported externalizing, the error variance for the conduct disorder indicator was negative when the model was initially estimated. Because this negative variance is not significantly different from zero, we constrained it to be zero. With this constraint, the model estimated properly.

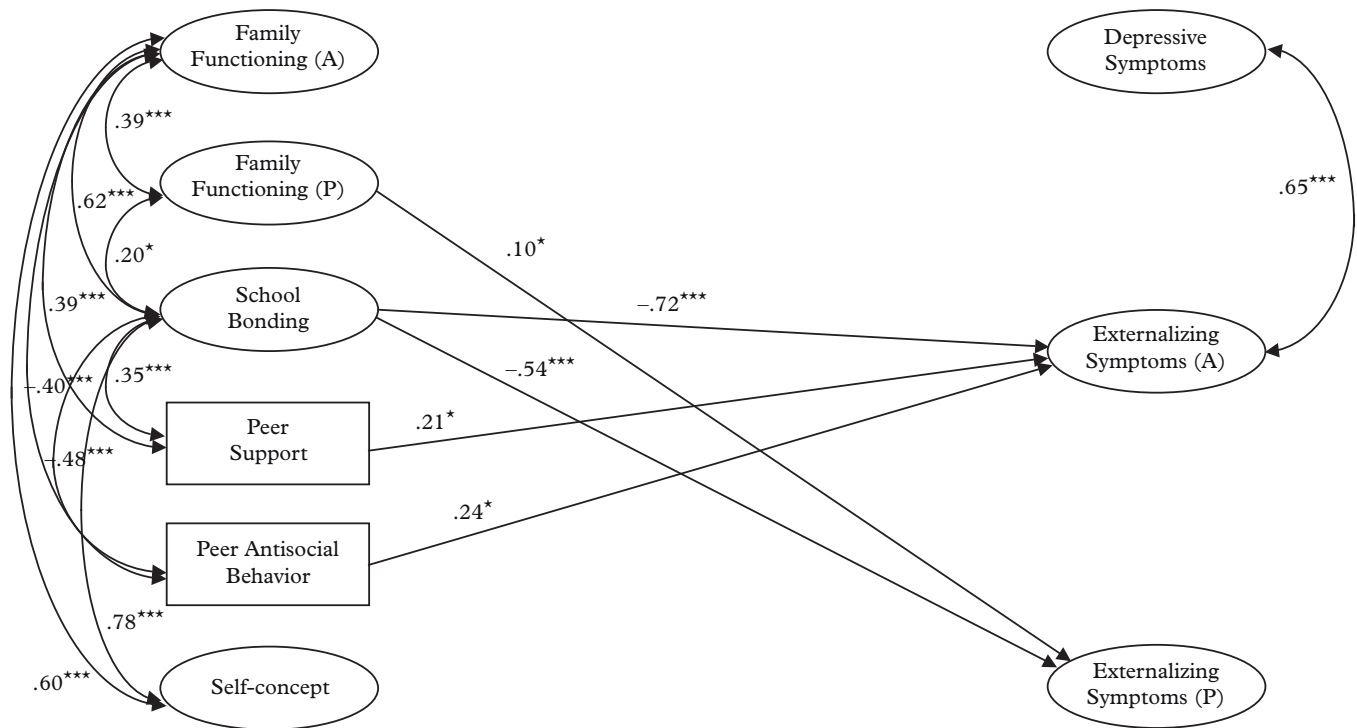


Figure 1. Contextual-only model.

Note. For purposes of clarity, indicators for latent variables and error terms are not shown. Only significant correlation and path coefficients are displayed.

Table 2

Correlation matrix among study constructs

Variable	2	3	4	5	6	7	8	9
1. Family Functioning (A)	.46***	.47***	-.45***	.63***	.63***	-.42***	-.47***	-.22**
2. Family Functioning (P)	–	.14	-.05	.29**	.12	-.20*	-.10	-.29**
3. Peer Support		–	-.15	.43***	.38**	-.33***	-.13	-.09
4. Peer Antisocial Behavior			–	-.50***	-.63***	.25**	.59***	.20*
5. School Bonding				–	.78***	-.41***	-.72***	-.37***
6. Self-concept					–	-.55***	-.85***	-.30***
7. Depressive Symptoms (A)						–	.60***	.19*
8. Externalizing Symptoms (A)							–	.39***
9. Externalizing Symptoms (P)								–

Note. (A) = adolescent report; (P) = parent report.

* $p < .05$; ** $p < .01$; *** $p < .001$.

bonding was negatively related to all three indices of psychosocial functioning: depressive symptoms, $\beta = -.24$, $p < .06$; adolescent-reported externalizing symptoms, $\beta = -.72$, $p < .001$; and parent-reported externalizing symptoms, $\beta = -.54$, $p < .001$. Parent-reported family functioning was negatively related to parent-reported externalizing symptoms, $\beta = -.24$, $p < .03$; and peer antisocial behavior was positively related to adolescent-reported externalizing symptoms, $\beta = .24$, $p < .03$. Neither adolescent-reported family functioning nor peer support was significantly related to any of the psychosocial functioning indices.

When self-concept was added to the model as a mediating mechanism (see Figure 2), the resulting model fit the data well, $\chi^2(143) = 300.54$, $p < .001$; CFI = .90; RMSEA = .08. The fit of this model was equivalent to that of the bivariate

correlations model, $\Delta\chi^2(6) = 17.70$, $p < .01$; Δ CFI = .007; Δ NNFI = .004. However, in this model, 36% and 83% of variability in depressive symptoms and adolescent-reported externalizing, respectively, was explained, compared to 23% and 68% for the contextual-only model. In the self-concept mediation model, school bonding was directly related to parent reports of externalizing symptoms ($\beta = -.38$, $p < .05$), but not to adolescent-reported externalizing or depressive symptoms. As was the case in the contextual-only model, parent-reported family functioning was negatively related to parent-reported externalizing symptoms, $\beta = -.28$, $p < .01$. Peer antisocial behavior was related to adolescent-reported externalizing, $\beta = .23$, $p < .05$. Self-concept was significantly related to depressive symptoms, $\beta = -.65$, $p < .03$, and adolescent-reported externalizing, $\beta = -.76$, $p < .03$.

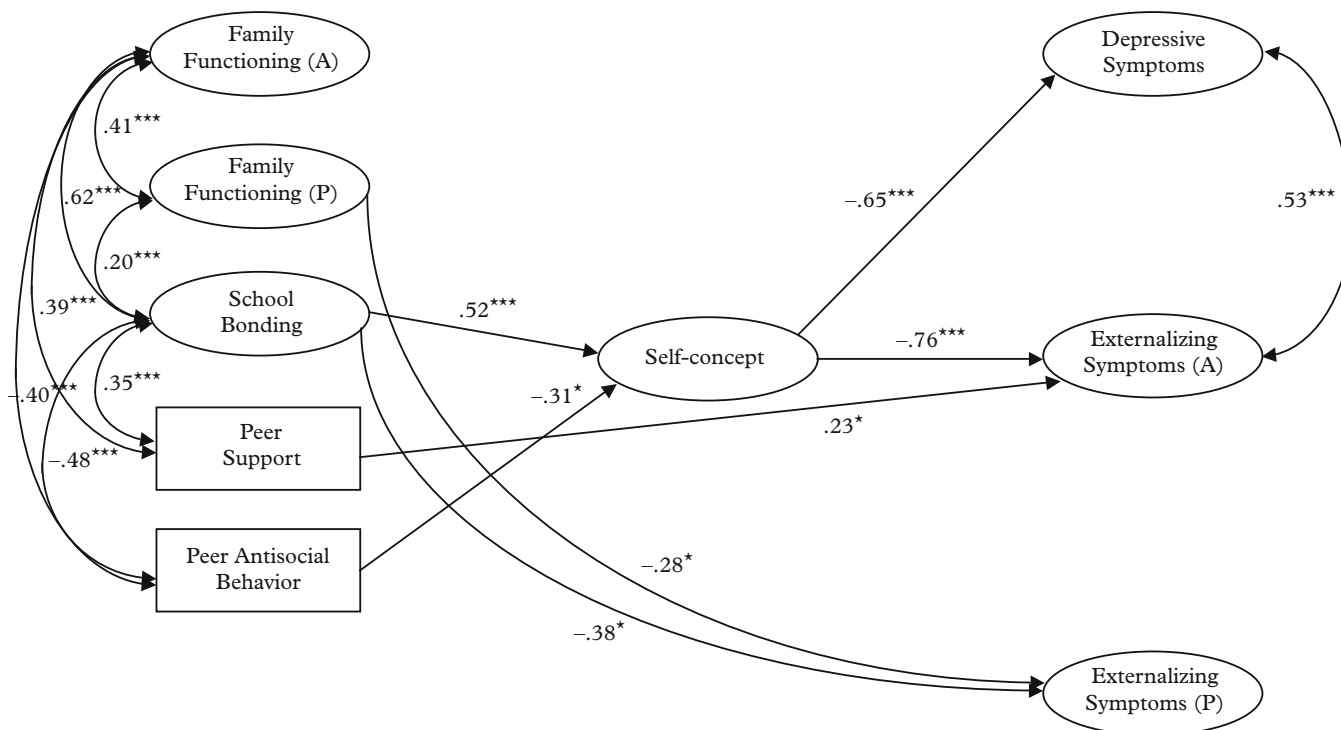


Figure 2. Self-concept-added model.

Note. For purposes of clarity, indicators for latent variables and error terms are not shown. Only significant correlation and path coefficients are displayed.

As part of this model, we examined whether self-concept partially mediated the relationship of school bonding and peer antisocial behavior to depressive symptoms and adolescent-reported externalizing symptoms. To test for mediation, we used the asymmetric distribution of products test (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). MacKinnon et al. describe this test as the most powerful tool for testing mediation in structural equation models. The coefficient for mediation is computed as the product of the two unstandardized path coefficients that comprise the hypothesized mediating pathway. A 95% confidence interval around this coefficient is then estimated. If this confidence interval does not include zero, then partial mediation is assumed (it is worthy of note that MacKinnon et al. acknowledge only partial mediation and argue that full mediation does not exist). For the path from school bonding to depressive symptoms, the point estimate for the test of mediation was $-.288$, with a 95% confidence interval ranging from $-.547$ to $-.028$. For the path from school bonding to adolescent-reported externalizing, the point estimate for the test of mediation was $-.264$, with a 95% confidence interval ranging from $-.508$ to $-.020$. For the path from peer antisocial behavior to depressive symptoms, the point estimate for the test of mediation was $-.198$, with a 95% confidence interval ranging from $-.379$ to $-.017$. For the path from peer antisocial behavior to adolescent-reported externalizing, the point estimate for the test of mediation was $-.182$, with a 95% confidence interval ranging from $-.352$ to $-.012$. As a result, in this model we assumed that self-concept partially mediated the relationships of school bonding and peer antisocial behavior to both depressive symptoms and adolescent-reported externalizing.

We then estimated an alternative mediation model, where

contextual variables were posited as mediating the relationship of self-concept to adolescent psychosocial functioning. This model fit the data well, $\chi^2(143) = 295.81$, $p < .001$, CFI = .91, RMSEA = .08. The fit of this model was equivalent to that of the bivariate correlations model, $\Delta\chi^2(6) = 12.97$, $p < .05$; Δ CFI = .003; Δ NNFI = .004. Thirty-seven per cent of variability in depressive symptoms and 83% of variability in adolescent-reported externalizing was explained by the model. Self-concept was significantly related to depressive symptoms, $\beta = -.67$, $p < .03$, and adolescent-reported externalizing, $\beta = -.79$, $p < .03$. Self-concept was also significantly related to adolescent-reported family functioning, $\beta = .61$, $p < .005$, school bonding, $\beta = .77$, $p < .005$, peer support, $\beta = .37$, $p < .05$, and peer antisocial behavior, $\beta = -.64$, $p < .005$. None of the contextual variables were significantly related to adolescent-reported depressive or externalizing symptoms. Because no mediation emerged, no figure is presented for this model.

Discussion

The primary objective of the present study was to extend ecodevelopmental theory (Szapocznik & Coatsworth, 1999) by examining concurrently the role of contextual variables and self-concept in adolescent depressive and externalizing symptoms. A sample of Hispanic adolescents from immigrant families was used to test the hypotheses that (a) self-concept would explain additional variability in adolescent depressive and externalizing symptoms, over and above the contributions of contextual variables; (b) self-concept would partially mediate the relationships of contextual variables to adolescent

adjustment; and (c) contextual variables would partially mediate the relationships of self-concept to adolescent adjustment.

The first hypothesis received some support. Self-concept was strongly correlated with adolescent-reported depressive symptoms and was moderately correlated with both adolescent- and parent-reported externalizing symptoms at the bivariate level, and it continued to be strongly related to adolescent depressive and externalizing symptoms when contextual variables were considered. The second hypothesis was supported for school bonding and for peer antisocial behavior. Self-concept emerged as a significant mediator in the relationships of school bonding and peer antisocial behavior to depressive and externalizing symptoms. The third hypothesis was not supported; even when the relationships of self-concept to depressive and externalizing symptoms were posited as operating through contextual variables, the direct relationships of self-concept to these adjustment indices remained strong and significant, and the contextual variables were not related to adolescent adjustment. These findings suggest that, in Hispanic adolescents, self-concept is most proximal to adolescent reports of both internalizing and externalizing problems, consistent with Dodge and Pettit's (2003) hypothesis that ecological variables influence behavior and adjustment through their effects on intrapersonal variables. The finding is also consistent with Schwartz, Montgomery, and Briones (2006), who argue that personal identity and its components, such as self-concept, are most strongly protective against adjustment problems in immigrants and their immediate descendants. The pattern suggested by the present findings is that contextual variables contribute to the valence of the self-concept, which then produces behavior and adjustment that is either consistent (in the case of poor self-concept) or inconsistent (in the case of high self-concept) with depressive and externalizing symptoms.

Relationships between family functioning and adolescent adjustment

The lack of association between family functioning and externalizing symptoms at the multivariate level is inconsistent with previous literature, especially given the strong, robust, and well-established associations between family functioning and adolescent externalizing symptoms (e.g., Formoso, Gonzales, & Aiken, 2000; Vazsonyi, 2003). Adolescent-reported family functioning was significantly related to all three adolescent adjustment indices, to the peer and school variables, and to self-concept at the bivariate level, but at the multivariate level it was not related to any of the adjustment indices. The relationships of adolescent-reported family functioning to adolescent depressive and externalizing symptoms may have operated through both school bonding and self-concept. There may be both methodological and cultural explanations for the lack of direct relationships between adolescent-reported family functioning and adolescent adjustment at the multivariate level. Methodologically, the strong correlation between adolescent-reported family functioning and school bonding may account for the lack of association between adolescent reports of family functioning and adjustment. Given that SEM is an extension of multiple regression (Kline, 1998; Quintana & Maxwell, 1999), it can be assumed that, when two independent variables are highly correlated with one another, the variance that they share with a given dependent variable is

assigned to the independent variable with the stronger bivariate relationship to that dependent variable (cf. Cohen & Cohen, 1983). It is important to replicate the present study longitudinally to ascertain the extent to which self-concept and variables in the school microsystem might mediate the effects of family functioning on psychosocial outcomes in Hispanic adolescents.

Culturally, it is important to consider immigration and acculturation and their effects on the family system. Immigration often disrupts the family system as children and adolescents acculturate quickly while parents often do not (Szapocznik & Kurtines, 1993). Parents who immigrate as adults to ethnic enclaves such as Miami may remain unacculturated years after immigrating (Schwartz, Pantin, Sullivan, Prado, & Szapocznik, 2006), suggesting that acculturation discrepancies between parents and adolescents may be salient even for families who have been in the United States for years. It is possible, to the extent that the family system remains cohesive and is not disrupted by acculturation issues, that adolescents are likely to be bonded to school. On the other hand, when the family system is disrupted by acculturation, adolescents' bonding to school may be compromised. In turn, their self-concepts may be less positive, and they may be vulnerable to depressive and externalizing problems.

The salience of school to Hispanic youth may have also contributed to school bonding being "closer" than family functioning to adolescent adjustment. For Hispanic youth, school is an especially critical context: As of 2003, almost 50% of U.S. Hispanic students were not graduating from high school, and less than 20% were college-ready (Greene & Forster, 2003). Hispanic students, especially those from recent immigrant families, may experience difficulties adjusting to the competitive middle-school atmosphere (cf. Ibañez, Kuperminc, Jurkovic, & Perrilla, 2004). Hispanic immigrant parents tend not to be familiar with the American school system and may not be able to help their adolescents with school (Rodriguez-Brown & Meehan, 1998).

Reporter effects

The extent to which the association of self-concept with adolescent-reported, but not parent-reported, internalizing and externalizing (a) supports Harter's (1999) phenomenological position or (b) reflects within-reporter bias is not known. With regard to Harter's perspective, the linkage between self-perceptions and behavior may be a within-person, phenomenological process that is most effectively measured and tested through self-report. The results of the present study are partially supportive of this contention. Research has indicated that parents and youth have different vantage points on the youth's ecodevelopmental context and adjustment, and that understanding these differences is important in itself (Achenbach et al., 2002; Tein et al., 1994).

Limitations

A number of limitations of the present study warrant discussion. Possibly the most important potential limitation is the cross-sectional design used in the present study. Although this design facilitated examination of the relationships of contextual variables and self-concept to adolescent depressive and externalizing symptoms at a single point in time, it did not

permit examination of the effects of contextual variables and self-concept on changes in, or subsequent levels of, adolescent outcomes. Therefore, although examining models with different “causal flow” has provided some insight into the potential directionality of the relationships examined, the present results cannot be interpreted as indicating sequentiality within the relationships obtained. Such directionality can be most appropriately examined in the context of a longitudinal study.

Moreover, we used only one construct (i.e., self-concept) to represent the “internal microsystem” in the present study. Bronfenbrenner (1979) includes multiple domains of interpersonal functioning in his social-ecological model. Moreover, Newcomb and colleagues (Locke et al., 2005; Newcomb et al., 2003) used indices of self-efficacy and of risk behaviors (e.g., substance use and sexual risk taking) to represent the internal microsystem. Although the present study is one of the first (cf. Henderson et al., in press) in which self-concept has been included along with contextual variables as a correlate of adolescent depressive and externalizing symptoms, it is important to include other dimensions of intrapersonal functioning as well.

A third potential limitation is the exclusive reliance on self-report questionnaires. Although data were gathered from both adolescents and parents, the use of independent reports of family functioning (e.g., observational measures), school bonding and academic competence (e.g., scholastic and conduct grades; teacher reports of adolescent school bonding), and peer relationships and antisocial behavior (e.g., reports from peers and from peers’ parents) might have reduced self-report bias and provided a fairer test of the study’s research questions and hypotheses. In particular, although adolescents’ perceptions of peers’ behavior are strongly predictive of the adolescent’s own behavior, adolescents often overestimate the extent to which their peers engage in antisocial or delinquent behaviors (Botvin, Botvin, Baker, Dusenbury, & Goldberg, 1992; Prinstein & Wang, 2005).

A fourth potential limitation concerns generalization to the broader Hispanic community. Although the largely Cuban and Nicaraguan sample is indeed representative of the low-income areas from which the sample was drawn, it is not representative of the U.S. Hispanic population as a whole (which is of roughly 65% Mexican origin and 10% Puerto Rican origin; Ramirez & de la Cruz, 2003). As a result, care should be taken in generalizing to the broader U.S. Hispanic population. Replication with more nationally representative Hispanic samples might help to extend the generalizability of the present findings.

Finally, the present analyses should be considered exploratory because of the fairly small sample size. Statistical simulation studies have found that the most common problems occurring in SEM models with small samples are failure to converge on a solution, lowered acceptability of model fit indices (e.g., decreases in CFI and NNFI, and increases in RMSEA), misestimated model parameters, and artificially low standard errors (Bentler & Yuan, 1999; Nevitt & Hancock, 2004). Because such problems artificially adjust model parameters and fit indices, they would likely produce results with interpretational problems. However, given that the present results are theoretically interpretable, we concluded that the model could probably be validly estimated with the available sample size.

Despite these limitations, the present findings may have

important implications for further research. Although the findings reported here are exploratory because of the cross-sectional design and small sample, they may help to open a new line of research on the combined effects of self and context on adolescent psychosocial functioning (cf. Schwartz et al., 2005). In particular, the mediational relationships in the present results suggest important hypotheses for future research. First and most germane to the purpose of the present study, it is important to explore the mechanisms by which self-concept might mediate the relationships of contextual variables to adolescent adjustment. As noted earlier, the precise nature of the interrelationships among family functioning, peer variables, self-concept, school bonding/competence, and externalizing behavior should be examined using a longitudinal design, a larger sample, and more advanced statistical techniques. Specifically, it is possible that a positive family environment and positive experiences with school help to promote positive self-concepts, and that low self-concept is then prognostic of depression (Harter, 1999) and externalizing symptoms (Donnellan et al., 2005). The ways in which the relationships of family functioning to adolescent adjustment may operate through school bonding and self-concept also warrant further research.

Finally, the present results may have important implications for designing and implementing preventive interventions with Hispanic immigrant adolescents. Although it is certainly important to intervene in the adolescent’s ecodevelopmental context to prevent problematic adolescent outcomes (Pantin, Schwartz, Sullivan, Coatsworth, & Szapocznik, 2003), it may also be important to target the adolescent’s sense of self. Intervening in both self and context may provide maximal protection against risks for problem behaviors, depression, and their sequelae (e.g., substance use, suicidal ideation). It may be advantageous to include self-based interventions along with intervention strategies used to promote positive functioning in the family, school, and peer microsystems. It is through such intervention development and streamlining that research on the role of self and context in adolescent adjustment may bear the most fruit.

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