

THE “DARK SIDE” OF SELF-ESTEEM: EXAMINING THE RELATION BETWEEN  
OVERLY-POSITIVE SELF-PERCEPTIONS AND AGGRESSIVE BEHAVIOR IN  
ADOLESCENTS

A Dissertation

Submitted to the Graduate School  
of the University of Notre Dame  
in Partial Fulfillment of the Requirements  
for the Degree of

Doctor of Philosophy

by

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December 2003

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Abstract

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Overly positive self-perceptions have been generally associated with psychological health. Recent research has suggested, however, that these overly positive perceptions may also be associated with aggressive or violent behavior. The current study examined the relation between aggressive behavior and self-perceptions in an adolescent population (grades 7-12). We examined both cross-sectional and longitudinal relations, and looked at both change in individual differences and individual differences in change. We examined all longitudinal hypotheses bi-directionally. We used multi-dimensional measures of self-concept that are tailored specifically to assess domains relevant to adolescents.

## DEDICATION

To my Mother and Father who always combined the perfect balance of encouragement,  
realism, discipline and caring.

## CONTENTS

FIGURES.....	iv
TABLES.....	v
ACKNOWLEDGMENTS.....	vi
INTRODUCTION.....	1
METHOD.....	11
ANALYSES.....	24
DISCUSSION.....	45
REFERENCES.....	50

## FIGURES

FIGURE 1	Modeling Change in Individual Differences in the Relation Between.....34 Overestimations of Competence and Aggressive Behavior
FIGURE 2	Factor of Curves (FOCUS) Model of Individual Differences.....40 in Change of Overestimations of Competence
FIGURE 3	Factor of Curves (FOCUS) Model of Individual Differences.....41 in Change of Aggressive Behavior
FIGURE 4	Path Analysis of the Relation Between Common Intercepts.....42 and Slopes of Overestimations of Competence and Aggressive Behavior.

## TABLES

TABLE 1	Means and Standard Deviations of Peer- and Teacher-Reported Competence.....	12
TABLE 2	Factor Loadings of Self-Reported Aggression Items.....	18
TABLE 3	Factor Loadings of Teacher-Reported Aggression Items.....	20
TABLE 4	Factor Loadings of Peer-Reported Aggression Items.....	21
TABLE 5	Factor Loadings of Parent-Reported Aggression Items.....	22
TABLE 6	Means and Standard Deviations for Younger Cohort.....	25
TABLE 7	Means and Standard Deviations for Older Cohort.....	26
TABLE 8	$R^2$ of Multiple Regressions-Younger Cohort.....	27
TABLE 9	$R^2$ of Multiple Regressions-Older Cohort.....	28
TABLE 10	Factor Loadings of Overestimations Relative to Parent, Teacher, and Peer onto a Single Factor.....	30
TABLE 11	Factor Loadings of Overestimations Relative to Teacher and Peer onto a Single Factor.....	31
TABLE 12	Standardized Regression Weights of Latent Variables onto Manifest Variables for the Change-In-Individual-Differences Models: Fall/Spring.....	35
TABLE 13	Goodness-of-Fit Indices for Structural Equation Models.....	36
TABLE 14	Standardized Path Coefficients from Overestimations of Competence/Aggressive Behavior Fall To Overestimations of Competence/Aggressive Behavior Spring.....	37

## ACKNOWLEDGMENTS

Thank you to my advisor, David Cole. You are a truly gifted teacher and I consider myself very lucky to have had someone who places such a high priority on the success of his graduate students as an advisor. Thank you also to the other members of Project Competence : Lachlan Peeke, Joan Martin, Alesha Seroczynski, Jane Tram, Mark Ruiz, Farrah Jacquez, and Tracy Maschman for all of the work that went into the project that produced this data. Thank you to them members of my dissertation committee, Scott Maxwell, David Smith, Anre Venter, and William Bruinsma. Special thanks to Scott Maxwell for statistical consultation on this project. This research was made possible by a National Institute of Mental Health Grant R29 MH47846 awarded to David A. Cole.

## INTRODUCTION

Research has linked overly positive self-perceptions to both positive and negative aspects of mental health. Although researchers and the public at large believe that a positive view of oneself reflects psychological health (Taylor, 1989; Taylor and Brown, 1988), some research suggests that having an overly positive view of self may increase a person's risk of engaging in violent or aggressive behavior. These experts believe that having an overly positive sense of self, relative to others' perceptions, makes individuals vulnerable to ego threats when they receive feedback that contradicts self-perceptions (Baumeister, Smart, and Boden, 1996). Reacting with aggressive or violent behavior to this threat has the immediate effect of eliminating the feedback and helping the individual regain esteem, and the long-term effect of discouraging others from expressing negative feedback in the future (Athens, 1989). Research on the relation between positive self-perceptions and aggression in adults suggests a positive relation (Baumeister, Smart, and Boden, 1996; Kernis, Grannemann, and Barclay, 1989), whereas the research on the same relation in children has produced mixed results (David & Kistner, 2000, Kupersmidt & Patterson, 1991; Patterson, Kupersmidt, & Griesler, 1991). The changing nature of self-perceptions and aggressive behavior during adolescence makes causal inferences a difficult task. Unfortunately, relatively little research has formally examined this relation in adolescents. In the current study, we focused on the relation between overly positive

self-perceptions and aggressive behavior in adolescence, using developmentally appropriate measures, and using techniques that quantify self-perceptions in a value-neutral manner (Baumeister, Smart, & Boden, 1996).

One body of research has suggested that positive self-perceptions, realistic or not, correlate with a healthy sense of self. Findings in social, cognitive and clinical psychology suggest that healthy people tend to distort information in a positive direction (Fiske & Taylor, 1984; Taylor, 1989; Taylor & Brown, 1988; Taylor, 1983; Sackeim, 1983; Svenson, 1981; Greenwald, 1980; Kuiper, Olinger, McDonald, & Shaw, 1985; Nisbitt & Ross, 1980; Bargh & Tota, 1988). People typically overestimate their abilities, inflate their sense of control over uncontrollable events, and hold overly optimistic views about the future (Taylor, 1989; Goffman, 1967). The absence of these illusions correlates with behavioral and mental health problems. The literature on depressive realism suggests that depressed people are less likely to overestimate themselves or their abilities (Alloy & Abramson, 1979; see Haaga & Beck, 1995 for a review). Cognitive theories of depression also suggest that psychological health has a direct relation to positive self-perceptions (Beck 1963, 1972; Abramson, Seligman, & Teasdale, 1978; Beck, 1963; Rehm, 1977; Kuiper & Derry, 1982; Segal, 1988). Still other authors suggest that low self-esteem represents an underlying cause of aggressive behavior (Anderson, 1994; Renzetti, 1992; Long, 1990; Levin and McDevitt, 1993; Long, 1990; MacDonald, 1975). Although empirical findings do not support the idea that low self-esteem leads to violent behavior (Baumeister, Smart, & Boden 1996), most people seem to hold this view (Staub, 1989).

A very different body of research has found that overly positive self-perceptions may have a “dark side” and may not be the hallmark of mental health that some have suggested (Colvin, Block, & Funder, 1995). In a compelling review of the literature, Baumeister, Smart, and Boden (1996) argue that overly positive self-perceptions make one susceptible to ego threats, which in turn incite violent behavior. Ego threats occur when individuals receive aversive feedback that challenges their high self-perceptions. When these ego threats occur, people behave in a manner that will protect their self-appraisals (De La Ronde & Swann, 1993; Swann, 1987). They may even resort to drastic measures to protect high self-esteem, including hostility and violence (see Blaine & Crocker, 1993 for review). According to Baumeister (1996), when ego threats occur, individuals react in one of two ways. They either lower their self-appraisals, which results in feelings of dysphoria and social rejection, or they lash out aggressively at the source of the disconfirming information in order to avoid these feelings and protect their high self-appraisals. Reacting aggressively serves three purposes: denying the negative information, regaining a measure of status, and discouraging further negative information from being revealed. The aggressive behavior protects individuals from negative feelings associated with negative feedback and helps one maintain positive self-perceptions.

Although the adult literature seems to provide noteworthy evidence of a “dark side” to overly positive self-perceptions, few studies have looked for that same relation in adolescents. Salmivalli and colleagues (1999) found that Finnish adolescents with low peer-reported self-esteem were victimized by bullies more often than were their classmates. Those who engaged in bullying behavior received high scores from peers on questions such as, “He thinks too much of himself,” and “He can’t take criticism,” which

may reflect inflated self-esteem. Though this provides some evidence of a relation between self-esteem and aggression, these questions are inherently value-laden, and are not a pure estimation of self-esteem. Research that focuses on delinquent adolescents also supports the idea that aggressive behavior and high self-esteem are positively related, although none have assessed that relation directly. Slaby and Guerra's (1988) study found that antisocial-aggressive adolescent offenders believed that aggressive behaviors would help them increase their self-esteem whereas non-offenders did not. Those findings support one part of Baumeister's theory, that aggression can help adolescents maintain overly positive self-perceptions. Delinquent youth were more likely to be self-assertive, socially assertive, defiant, and narcissistic (traits not typically associated with low-self esteem) than were their non-delinquent peers (Glueck & Glueck, 1950). Jankowski's (1991) and Anderson's (1994) observations of gangs further supported the idea that violence was not related to low self-esteem. Gang members tended to display traits such as self-competence, drive to compete, and blaming of external sources for failures. The gang members' violence tended to be directed towards those who did not acknowledge their social status, or who expressed disrespect towards them. They tended to engage in more violent behavior as their ambition increased, and they believed that they should be treated as superior beings. Though these observations are consistent with the idea that aggressive behavior is associated with high not low self esteem, the relation was not formally tested. This research provides hints at the relation between self-esteem and aggression in adolescence; however, no study has directly assessed the relation between self-esteem and aggressive behavior in an adolescent population, using value-neutral measures.

Although the current study focuses on adolescents, a review of the research done on children sheds some light onto how to proceed in studying this relation in adolescents. David and Kistner (2000) directly examined the relation between self-esteem and aggression in third through fifth grade children. They found that children with overly positive social self-perceptions also tended to receive more peer nominations for both overt and relational aggression. They also found that even students with only moderately positively biased self-perceptions tended to have heightened levels of aggression. Other studies also support the existence of a direct relation between overly high self-perceptions and either aggression (Hymerl et al., 1993; Patterson et al., 1990; Zakriski & Coie, 1996; Hughes et al., 1997) or externalizing behaviors in children (Bloom, Shea, & Eun, 1979; Burdett & Jensen, 1983; Cole & Kumchy, 1981; Lochman & Lampron, 1986; Schaunghency et al., 1987; Schneider & Leitenberg, 1989). Other research has found no relation between the two variables in children (Anastas & Reinherz, 1984; Hymel, et al. 1990; Kupersmidt & Patterson, 1991). Though the overall picture is far from clear, Edens (1999) noted that the more methodologically sophisticated studies (ones that compared children's self-evaluations against an "objective" source) tend to show that aggressive children report elevated levels of competence relative to others' perceptions of their competence. In the current study, we will use the technique that has been effective in detecting the relation between self-esteem and aggression in children, and apply it to adolescents, thereby comparing adolescents' self-perceptions to three outside sources of information (i.e., parents, teachers, and peers).

Because changes in both self-concept (Harter, 1982; Shirk & Renouf, 1992) and aggressive behavior (Sroufe, 1997; Sroufe & Rutter, 1984) are hallmarks of adolescence,

research on the relation between the two variables should use developmentally appropriate measures (Edens, 1999). Developmental research supports the idea that aggressive and delinquent behavior increases with age, at least into mid-adolescence (Achenbach, 1991; Loeber et al., 1998; Elliott, Ageton, Huizinga, Knowles, & Canter, 1983; Pedersen & Wichstrom, 1995; Grisso, 1998; Lahey et al., 2000). Most adolescent males engage in behaviors that would be regarded by the justice system as either misdemeanors or felonies (Elliott, et al.1983). The increase in aggressive or delinquent behavior, however, does not persist into adulthood. Arrests per 1000 youths begin to increase at age 12, but drop off dramatically at age 18 (Howell et al., 1985; Moffitt, 1993). Most youths who are arrested in adolescence do not continue offending past the adolescent years (Grisso, 1998).

As aggressive behavior changes across the developmental span, so does self-concept. In general, self-concept becomes increasingly stable over the course of development (Cole et al., 2001; Shavelson et al., 1976; Wylie, 1979). Children's competence beliefs become more realistic and more tightly linked to the appraisals of significant others (Eccles et al., 1993; Marsh et al., 1998; Wigfield, 1994; Wigfield et al., 1997). Despite this overall trend, there are periods of transition during which self-concept changes dramatically. In early adolescence, transitions such as the move from elementary to middle school, the onset of puberty, and the emergence of formal operational reasoning may contribute to a drop in self-concept during early adolescence, and a recovery during later adolescence (see Harter, 1998 for a review).

Although many adolescents experience such a drop in global self-competence, the changes in self-concept that take place during adolescence are far from uniform (Arnett,

1999). Changes in self-image during adolescence can occur both in global self-esteem as well as in individual domains of competence. As children develop, they invest in activities in which they perceive themselves as competent, and divest from those domains in which they feel less competent (Eccles et al., 1983; Wigfield et al., 1997; Harter, 1985). Previous research suggests that adolescents may experience drops in different domains of self-concept at different grade levels (Marsh, 1989; Eccles et al., 1989; Wigfield, et al., 1991). Transitions such as the onset of puberty and the transition from elementary to middle school bring about changes in some domains of self-concept but not others (Eccles et al., 1989, Hoge et al., 1990). Consequently, research done on adolescent's self-concept should account for the multi-dimensional nature of self-concept in adolescents.

Because self-concept is still under construction during childhood and adolescence, the possibility exists that overestimations of self-concept lead to different reactions at different stages of development. Panak and Garber (1992) found that, in children, perceived peer rejection predicted depression. Perhaps children are unable to maintain high levels of self-concept when confronted with negative feedback, but as they mature into adolescence their self-concept becomes less and less dependent on the views of others (McKeough, Yates, & Marini, 1994). This speculation corresponds with research findings suggesting that the cognitive-developmental changes that increase children's ability to understand relationships by assuming the perspective of others may also enhance their ability to construct and defend their self-model (Cairns et al., 1989; Kobak & Sceery, 1988). In other words, when children who lack fully developed perspective taking ability receive aversive feedback, they believe the feedback, incorporate it into

their self-model, and may become depressed as a result of a great deal of such feedback. As they mature into adolescence however, their perspective taking ability develops, they are more likely to defend their self-model in the face of aversive feedback, and are more likely to use aggressive behavior to defend that model. If this were true, we would expect to see an increase in the relation between inflated self-esteem and aggression with age.

In this area, no tests of bi-directional hypotheses have been conducted. Research does suggest that aggressive behavior may serve to enhance self-concept. Athens (1992) found that almost all adults who had committed acts of extreme violence had learned that people who had witnessed their violent behavior treated them with a great deal of respect. Lochman and Dodge (1994) found that between fourth and seventh grade, moderately aggressive boys showed an increase in their overall self-worth and sense of social competence. Adolescent offenders tend to believe that aggressive behavior is a way of maintaining high self-concept (Slaby & Guerra, 1988). This research suggests that aggressive behavior may serve to maintain a positive yet unrealistic sense of self-worth. The current study will incorporate methods that will allow us to examine bi-directional hypotheses in order to help determine if inflated self-esteem predicts aggressive behavior, aggressive behavior predicts self-esteem, or both.

The results of the current study will also have clinical implications. A group of researchers have called for a modification of the self-esteem movement currently underway in our nation's schools (Baumeister, 1999; Staub, 1999). They argue that these programs falsely inflate adolescents' self-esteem, and that the subsequent increase in aggressive behavior is not worth the benefits that a few students receive from such self-esteem building programs. Baumeister (1999) argues that the resources currently used

in building self-esteem would be better allocated to developing self-control programs for adolescents that might ameliorate problems such as teen pregnancy, drug abuse, unsafe sex, and violence. The results of the current study will provide empirical evidence to inform the current debate on the usefulness of self-esteem building programs for adolescents.

The purpose of the current study is to examine the relation between aggressive behavior and overestimations of abilities in an adolescent population. This study advances the current research on this topic in several ways. First, we directly assess this particular relation in an adolescent population. Previous research has not directly studied adolescents using value-neutral measures of self-esteem. Second, we measure inflated self-esteem by comparing adolescents' views of their own competence to the views of significant others in the adolescents' lives (i.e., parents, teachers, and peers). This method is consistent with Baumeister et al.'s (1996) call to measure self-esteem as "a relatively value-neutral construct referring to positive evaluation of the self" (pp.28). Measuring self-views against objective sources, as has been done in younger populations, will allow us to link the current findings to previous research on this relation in child populations. Third, by comparing adolescents' views to three other sources of information (parents, teachers, and peers), we hope to get a more complete measure of competence overestimation than has been achieved in previous research. Fourth, we assess the adolescents' competence beliefs in multiple developmentally appropriate domains of competence (Harter, 1990, 1998). Fifth, we examine bi-directional hypotheses to shed light onto the nature of the causal relation between inflated self-perceptions and aggressive behavior. We predict that overestimations of competence and

aggressive behavior will be positively associated at all time points, and that the correlation between the two variables will increase with time. We also predict that overestimations of competence will predict later aggressive behavior and that aggressive behavior will predict later overestimations of competence. Finally, we predict that competence will predict later aggressive behavior to a greater extent than aggressive behavior will predict later overestimations of competence.

## METHOD

### **Participants**

Participants included 1248 students, their parents, teachers and peers. Students represented two middle schools and two high schools in a mid-size Midwestern city. Students came from two cohorts. The younger cohort was in seventh grade at the onset of the study and in ninth grade at the end. The older cohort was in tenth grade at the beginning of the study and in twelfth grade at the end. The sample was obtained from a larger pool of 1668 subjects involved in an ongoing longitudinal study (e.g., Cole, Martin, Peeke, Truglio, 1996). The 1248 were selected on the basis of having self-report data for at least one wave during the six waves of the current study. The current study represents the final three years of the larger study, which were the only years in which measures of aggressive behavior were administered.

We compared the 1248 selected for the current study to those who were not selected from the larger study on gender, race, competence, and aggression. The group selected for the study contained similar percentages of boys and girls as the larger group, and did not differ from the larger group on measures of aggressive behavior. The groups did differ on measures of competence, however, with those who were used in the current study scoring higher on measures of teacher- and peer-rated competence than those not used in the study. Table 1 displays the mean competence scores in eight domains for both samples at the first time point of the study. In most domains, the included participants obtained higher competence scores than did excluded participants. The pattern of competence results were similar at the five other time points of the current

study. The selected sample also differed from those not selected in terms of ethnic background (Chi-Square = 34.86,  $p < .001$ ), with African-Americans making up 43.5% of those not used in the current study, compared to 34.9% of those used in the current study.

TABLE 1  
MEANS AND STANDARD DEVIATIONS OF PEER- AND TEACHER-  
REPORTED COMPETENCE ACROSS 8 DOMAINS BROKEN DOWN BY  
INCLUSION STATUS

Domain	Peer Report				Teacher Report			
	Included		Excluded		Included		Excluded	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Academic	.097	.183	-.023	.112***	5.88	2.80	3.95	3.03***
Appearance	-.054	.133	-.050	.116	6.72	2.17	5.63	2.71**
Athletic	.104	.195	.023	.127***	4.77	2.75	3.38	2.60***
Behavior	.048	.126	-.023	.090***	6.74	2.58	4.42	3.28 ***
Friendship	.063	.094	.024	.071***	6.52	2.17	5.07	3.06***
Intimate Rel.	.006	.123	-.007	.091	4.49	2.52	4.53	3.03
Job	.062	.115	-.004	.091***	6.07	2.29	4.33	2.99***
Social	.189	.193	.095	.140***	5.63	2.48	3.97	3.02

\*\*= $p < .01$ , \*\*\*= $p < .001$

Within the sample used for this study, gender was evenly represented with 49.8% male and 50.2% female. The sample was racially heterogeneous, including White (53.8%), African American (34.9%), Hispanic (2.4%), multiethnic (0.9%) and “other” (5.7%)

children. Approximately 39.6% of the children had at least one parent with a previous divorce. Parent reported education level for mothers ranged from 10 to 20 years ( $M=12.6$ ,  $SD=2.4$ ); education level for fathers ranged from 11 to 20 years ( $M=13.7$ ,  $SD=2.3$ ), and annual family incomes ranging from less than \$10,000 to more than \$90,000 (Mdn=\$35,000). During each wave of the study, some students withdrew, and others were added. Virtually all attrition was attributable to students moving out of the school district, or dropping out of school, and all additions were students who moved into the district during the course of the study.

## **Measures**

*Self-Perceived Competence* Harter's (1988) Self-Perception Profile for Adolescents (SPPA) is a 45-item self-report measure of children's own evaluations of personal competence in eight domains and global self-worth (see appendix). The five domains (and sample items) are scholastic competence (e.g., "Some teenagers feel that they are very good at their school work; but other teenagers worry about whether they can do the school work assigned to them"), social acceptance (e.g., "Some teenagers find it hard to make friends; but other teenagers find it's pretty easy to make friends"), athletic competence (e.g., "Some teenagers do very well at all kinds of sports; but other teenagers don't feel that they are very good when it comes to sports"), physical appearance (e.g., "Some teenagers are happy with the way they look; other teenagers are not happy with the way they look"), behavioral conduct (e.g., "Some teenagers usually get in trouble because of things they do; but other teenagers usually don't do things that get them in trouble"), job-related competency (e.g., Some teenagers feel that they don't have enough skills to do well at a job; other teenagers feel that they have enough skills to do well at a job), romantic relationships (e.g., Some teenagers are not dating the people they are really attracted to; Other teenagers are dating those people they are attracted to), and close friendships (e.g., Some teenagers do have a close friend that they can share secrets with;

Other teenagers do not have a really close friend that they can share secrets with).

Responding to a given item is a two-step process. First, participants select which of the two statements describes children most like themselves. Then, they indicate whether the statement they selected is “really true for me”, or “sort of true for me.” Items are scored on 4-point rating scales such that high scores reflected greater self-perceived competence. Correlations between the subscales ranged from .10 to .43 in previous research (Harter, 1988) and from .06 to .59 at the first wave of the current study. Factor analysis supports the discriminant validity of these domains of competence (Harter, 1988). The subscales also have good internal consistency (Harter, 1988) and test-retest reliability (Harter, 1982) in previous research..

*Teacher's Evaluations of Competence* To obtain teachers' appraisals of adolescents' competencies, we used Harter's (1985) Teacher's Rating Scale of Adolescent's Actual Behavior (TRS). The TRS is a 16-item measure of teachers' appraisals of adolescents' competencies, parallel in form and content to the SPPA described above. On the TRS, teachers report how they perceive students' competencies, not how they believe students perceive their own competencies. For example, a pair of statements about the student pertaining to job competence is “This individual doesn't do well at paying jobs” or “This individual does well at paying jobs.” Next, teachers indicate whether this choice is “sort of true” or “really true.” Items are converted to 4-point rating scales such that high scores reflect greater perceived competence. Teachers were asked about multiple students in their classes, and each student had two teachers answer questions about their behavior. Item scores were aggregated across teachers and totals for each domain were formed based on the aggregated items. Correlations between the subscales ranged from .07 to .62 in the first wave of the current study. Pilot work for a previous study (Hoffman, Cole, Martin, Tram, & Seroczynski, 2000) indicated that the

TRS has good internal consistency (Cronbach's alphas ranged from .93 to .97 across 4 waves), and test-retest reliability (correlations ranged from .67 to .73 over a 4-month interval).

*Parental Reports of Adolescents' Competence* The Parent Rating Scale (PRS) is identical to the TRS, except that it is reworded for use by parents about their children. Responding to each item is a two-step process. First, parents select one of two statements about the adolescent's competence in either of eight different domains. For example, a pair of statements pertaining to job competence is "Which is more true about your child? My child does his/her best on paying jobs" or "My child does not always do his/her best on paying jobs." Next, parents indicate whether this choice is "sort of true" or "really true" about their child. As with the TRS, items are converted to 4-point rating scales such that high scores reflect greater perceived competence. In the first wave of the current study, the subscale correlations ranged from .00 to .67. Pilot work for a previous study (Hoffman, et al., 2000) indicated that the PRS had good internal consistency (alphas ranged from .80 to .88 excluding physical attractiveness which was attenuated due to restriction of range) and test-retest reliability (correlations ranged from .60 to .80 across a four month interval)

*Peer Nominations of Multiple Competencies* To obtain peers' estimates of adolescents' competence we used a modified version of the Peer Nomination of Multiple Competencies (PNMC; Cole, 1990, 1991; Cole & White, 1993). The PNMC assesses five domains of competence: academic competence, social competence, athletic competence, physical attractiveness, and behavioral conduct. We modified the measure to include three developmentally appropriate domains (Harter, 1988), which made this measure parallel in content to the other measures of competence used in the study. The assessment technique is similar to that used in many studies of children's social status (e.g., Coie, Dodge, & Coppotelli, 1992). For each of the eight domains, participants are asked to respond to two questions, one positive and one negative. For example, a pair of

items on the job competence subscale are “Who would be a good worker on a paying job?” and “Who can’t handle a job and might get fired?” The questions are printed across the top of an optical scan sheet, and classmates’ names are printed along the left side. To select a classmate for a particular characteristic, students shaded in a “bubble” across from the classmate’s name and below the appropriate question. Information obtained from each student contributed to the scores of others, not oneself. Students obtained scores for each of eight domains of competence. Each score represented the proportion of their classmates who nominated them for a particular positive or negative characteristic (e.g. gets really good grades in most subjects). For each domain, we subtracted the score on the negative item from the score on the positive item, such that higher scores on the composite indicated that the child received more positive than negative nominations. The original PNMC subscales have a high degree of stability and are negatively associated with a wide variety of maladaptive behaviors and outcomes (Cole, 1991; Cole & Carpentieri, 1990). In confirmatory factor analytic work, the subscales of the original PNMC loaded significantly onto their respective trait factors and only modestly onto a method factor, providing strong evidence of convergent and discriminant validity (Cole, 1990).

*Self-Report of Aggressive Behavior* The Adolescent Self-Report of Aggression (ASRA) is an eight-item questionnaire that was specially designed for use in the larger longitudinal study. The measure consists of six items that were adapted from two previous measures of aggression (Buss & Durkee, 1957; Buss & Perry, 1992), and two items that were added in order to create equal numbers of items that measure overt and relational aggression. Four of the items are designed to measure overt aggressive behaviors such as physical aggression, yelling, and swearing (e.g., “I get into fights more than the average person”). The other four items are designed to measure relational aggressive behavior such as withholding friendship, and attempting to influence others’ opinions of a person (e.g., “If I dislike someone, I try to keep them out of my group”).

Questions are answered on five-point Likert scales with subjects endorsing how true each question is for them. Higher scores represent greater levels of aggressive behavior. Cronbach's alphas for the current sample ranged from .72 to .80 (median = .75) indicating good internal consistency.

Exploratory factor analyses were conducted on the eight items, revealing two underlying factors. Two factors had eignenvales greater than 1.0 (Kaiser, 1960). All factor loadings for the two factors (except for item 5) were consistent with the overt/relational aggression constructs that were intended during the measures' construction. Table 2 shows the factor loadings for 7th-9th graders, and 10th-12th graders.

TABLE 2  
 FACTOR LOADINGS OF SELF-REPORTED AGGRESSION ITEMS ONTO  
 OVERT AND RELATIONALAGGRESSION FACTORS FOR GRADES 7-9 AND  
 10-12

Item	Grades 7-9		Grades 10-12	
	<u>Overt</u>	<u>Relational</u>	<u>Overt</u>	<u>Relational</u>
Hit Back	<b>.546</b>	.001	<b>.530</b>	.053
More Fights	<b>.584</b>	.080	<b>.362</b>	.062
Threatened	<b>.599</b>	.121	<b>.788</b>	.046
Yell or Swear	<b>.629</b>	.139	<b>.706</b>	.068
Say Mean Things	<b>.316</b>	<b>.465</b>	<b>.462</b>	<b>.334</b>
Silent Treatment	.039	<b>.300</b>	.036	<b>.473</b>
Keep out of Group	.028	<b>.701</b>	.017	<b>.651</b>
Get friends mad	.188	<b>.401</b>	.082	<b>.484</b>

*Peer's Report of Aggressive Behavior* The Peer-Nominated Index of Aggression (PNIA) is an eight-item questionnaire that was also designed for use in the larger longitudinal study. The measure consists of eight items that were adapted from two previous measures of aggression (Crick & Grotpeter, 1995; Brown, Atkins, Osborne, & Milnamow, 1996). Four of the items are designed to measure overt aggressive behaviors such as physical aggression, yelling, and swearing (e.g., "Who hits or pushes others?"). The other four items are designed to measure relational aggressive behavior such as withholding friendship, and attempting to influence others' opinions of a person (e.g., "Who gets even by keeping others out of the group?"). The assessment technique is similar to that used in many studies of children's social status (e.g., Coie, Dodge, & Coppotelli, 1992). The questions are printed across the top of an optical scan sheet, and classmates' names are printed along the left side. To select a classmate for a particular characteristic, students shaded in a "bubble" across from the classmate's name and below the appropriate question. Information obtained from each student contributed to the scores of others, not oneself. Each score represented the proportion of their classmates who nominated them for a particular characteristic. Cronbach's alphas for the current sample ranged from .76 to .90 (median = .86) indicating good internal consistency. Exploratory factor analyses were conducted on the eight items using similar procedures to the factor analysis of the self-reported aggression measure. Table 3 shows the factor loadings for 7th-9th graders, and 10th-12th graders. As with the self-report data, the analysis revealed a two-factor solution with overt and relational aggression as the two factors.

Teacher's Report of Aggressive Behavior. The Teacher Report of Adolescent Aggression (TRAA) is an eight-item questionnaire designed specifically for use in the larger longitudinal study. The measure consists entirely of items used in previous measures of aggression (Achenbach & Edelbrock, 1983; Kazdin, Rodgers, Colbus, &

Siegel, 1987). Four of the items are designed to measure overt aggressive behaviors such as physical aggression, yelling, and swearing (e.g., This student gets into fights). The other four items are designed to measure relational aggressive behavior such as withholding friendship, and attempting to influence others' opinions of a person (e.g., This student spreads gossip). Questions are answered on a three point scale with teachers answering whether the question is "really true," "sort of true," or "not true at all" for a particular student. Teachers were asked about multiple students in their classes, and each student had two teachers answer questions about their behavior. Total scores were aggregated across teachers. Higher scores represent greater levels of aggressive behavior. Cronbach's alphas for the current sample ranged from .85 to .93 (median = .91) indicating good internal consistency. Exploratory factor analyses were conducted in a similar fashion to those conducted on the peer and self-reported aggression forms. Table 4 shows the factor loadings for 7th-9th graders, and 10th-12th graders. As with the peer and parent aggression forms, a two-factor solution (overt and relational aggression) was deemed to be appropriate.

TABLE 3  
 FACTOR LOADINGS OF TEACHER-REPORTED AGGRESSION ITEMS ONTO  
 OVERT AND RELATIONAL AGGRESSION FACTORS FOR GRADES 7-9 AND  
 10-12

Item	Grades 7-9		Grades 10-12	
	<u>Overt</u>	<u>Relational</u>	<u>Overt</u>	<u>Relational</u>
Swears	<b>.465</b>	.045	<b>.438</b>	.081
Physically Abuses	<b>.684</b>	.023	<b>.827</b>	.070
Kicks or Hits	<b>.894</b>	.059	<b>.899</b>	.035
Shoves around	<b>.845</b>	.047	<b>.873</b>	.032
Tells untruths	<b>.304</b>	<b>.400</b>	.213	<b>.557</b>
Friend in Revenge	.008	<b>.657</b>	.014	<b>.779</b>
Says not friend	.079	<b>.804</b>	.058	<b>.824</b>
Gets others on side	.030	<b>.733</b>	.041	<b>.693</b>

TABLE 4  
 FACTOR LOADINGS OF PEER REPORTED AGGRESSION ITEMS ONTO  
 OVERT AND RELATONAL AGGRESSION ITEMS FOR GRADES 7-9 AND 10-12

Item	Grades 7-9		Grades 10-12	
	<u>Overt</u>	<u>Relational</u>	<u>Overt</u>	<u>Relational</u>
Hits or Pushes	<b>.964</b>	.089	<b>.870</b>	.086
Yells or Calls Names	<b>.814</b>	.058	<b>.761</b>	.080
Starts Fights	<b>.835</b>	.059	<b>.762</b>	.065
Picks on others	<b>.800</b>	.104	<b>.808</b>	.010
Keeps others out	.148	<b>.627</b>	.014	<b>.629</b>
Conditional Affection	.144	<b>.595</b>	.049	<b>.646</b>
Ignores when Mad	-.101	<b>.632</b>	.072	<b>.695</b>
Not in Group	.097	<b>.729</b>	.075	<b>.650</b>

*Parent's Report of Aggressive Behavior.* The Parent's Report of Adolescent Aggression (PRAA) is an eight-item questionnaire for use in the larger longitudinal study. The measure consists entirely of items which were selected from a previous measure of aggression (Lagerspetz, Bjorkqvist, & Peltonen, 1988). Four of the items are designed to measure overt aggressive behaviors such as physical aggression, yelling, and swearing (e.g., "How often does your son/daughter kick or hit others?"). The other four items are designed to measure relational aggressive behavior such as withholding friendship, and attempting to influence others' opinions of a person (e.g., "How often does your son or daughter start being someone else's friend in revenge"). Questions are answered on a five-point Likert scale with subjects endorsing how often their child engages in a

particular behavior. Higher scores represent greater levels of aggressive behavior. Cronbach's alphas for the current sample ranged from .77 to .87 (median = .79) indicating good internal consistency.

Exploratory factor analyses were conducted in a similar fashion to the factor analyses conducted on the self, peer, and teacher reports of aggression. Table 5 shows the factor loadings for 7th-9th graders, and 10th-12th graders. Once again, a two-factor solution (overt and relational aggression) was the most appropriate.

TABLE 5  
 FACTOR LOADINGS OF PARENT REPORTED AGGRESSION ITEMS ONTO  
 OVERT AND RELATIONAL AGGRESSION FACTOR ITEMS FOR GRADES 7-9  
 AND 10-12

Item	Grades 7-9		Grades 10-12	
	<u>Overt</u>	<u>Relational</u>	<u>Overt</u>	<u>Relational</u>
Physically Attacks	<b>.668</b>	.058	<b>.565</b>	.053
Swears Abusively	<b>.756</b>	.110	<b>.362</b>	.062
Threatens	<b>.876</b>	.020	<b>.788</b>	.046
Gets in many fights	<b>.843</b>	.026	<b>.706</b>	.068
Spreads Gossip	.011	<b>.817</b>	<b>.462</b>	<b>.334</b>
Not Talk	.084	<b>.788</b>	.036	<b>.473</b>
Actively excludes	.133	<b>.674</b>	.017	<b>.651</b>
Causes trouble btw Others	<b>.360</b>	<b>.498</b>	.082	<b>.484</b>

## **Procedures**

Prior to the beginning of the study, parents signed informed consent statements and completed brief demographic questionnaires as part of a larger longitudinal study. Participating students, their parents, and their teachers completed questionnaire packets every six months (once in the Fall and once in the Spring) for three successive years. This yielded six waves of data for the younger cohort (grades 7-9) and six waves for the older cohort (grades 10-12). Fall semester assessments occurred approximately six to eight weeks after the beginning of the school year. Spring assessments occurred approximately six to eight weeks before the end of the school year. Doctoral psychology students and upper-level undergraduates administered the questionnaires to participating students and their teachers one classroom at a time during the regular school day. Research assistants presented the measures in random order by classroom to control for order effects. Two or three additional research assistants circulated the classroom answering questions as they arose. Parents received the PRS by mail at approximately the same time as the student assessments. Parents mailed completed questionnaires to the university in pre-addressed, stamped envelopes. Postcards, phone calls, and letters sent home with students all served as reminders to parents when necessary. Parents could choose to receive \$10 for their participation or to have \$10 donated to the school for the purchase of educational materials.

## ANALYSES

### **Preliminary Analyses**

*Descriptive Statistics* Tables 6 and 7 show the means and standard deviations of the eight domains of competence and the measures of aggression for the younger and older cohorts, respectively. These results were comparable with previous studies that incorporated these measures with samples from non-clinical settings (Cole, Martin, Peeke, Truglio, et al., 1998; Hoffman, Cole, Martin, Tram & Seroczynski, 2000; Harter, 1985b; Smucker et al., 1986). These results indicate that the current study examines the relationship between competence and aggression across a large portion of the spectrum of these two variables. The content of tables 6 and 7 also indicate that our sample contains enough variance on measures of competence and aggression to allow for prediction of change in those variables over time.

*Computation of residuals* As in previous research (e.g., Cole et al., 1998; Connell & Ilardi, 1987), we used multiple regression to estimate the degree to which students over- or underestimate their competence relative to the appraisals of others. In each domain of competence, we computed the standardized residuals from the regression of children's self-rated competence onto teacher ratings and peer nominations in the same domain. Positive residuals represent the overestimation of competence on the part of the child, relative to what one would expect based on teacher and peer appraisals. Negative residuals represent underestimations. In subsequent analyses, we refer to these residuals as indices of overestimation. We computed residuals separately for each wave and for each domain of competence, a total of 96 regressions. Tables 8 and 9 shows the multiple Rs for these regression analyses for the younger and older cohort respectively.

TABLE 6  
MEANS AND STANDARD DEVIATIONS FOR YOUNGER COHORT

Variable	Self-Report		Teacher		Peer		Parent	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Academic Competence	12.25	4.48	5.55	2.30	.085	.191	7.42	2.11
Athletic Competence	12.73	4.62	4.72	2.47	.087	.166	5.96	3.11
Behavior Competence	11.74	4.54	6.59	2.73	.028	.119	7.45	2.09
Friendship	13.91	4.14	6.20	2.14	.051	.077	7.28	2.52
Intimate Relationships	11.46	4.53	3.48	1.94	.000	.116	3.33	2.25
Job Competence	13.17	3.52	5.29	1.65	.045	.116	6.57	2.56
Physical Attractiveness	12.30	5.13	6.59	2.15	-.083	.117	8.29	1.40
Social Competence	14.40	3.84	5.50	2.30	.191	.179	6.79	2.49
Total Aggression	17.92	6.35	1.11	2.19	.482	.441	12.29	3.80
Overt Aggression	9.23	3.67	0.34	1.01	.324	.327	6.38	2.29
Relational Aggression	8.67	3.65	0.78	1.44	.157	.149	5.91	2.28

TABLE 7  
MEANS AND STANDARD DEVIATIONS FOR OLDER COHORT

Variable	Self-Report		Teacher		Peer		Parent	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Academic Competence	13.26	4.16	6.41	2.52	.117	.180	8.02	1.50
Athletic Competence	11.77	5.49	4.94	3.09	.127	.231	5.86	3.41
Behavior Competence	12.18	4.35	7.16	2.23	.081	.130	7.84	1.88
Friendship	14.11	4.32	6.98	2.38	.078	.109	7.35	2.31
Intimate Relationships	12.82	4.35	5.26	2.71	.011	.135	4.79	2.89
Job Competence	14.62	3.52	6.49	2.38	.087	.121	7.56	2.44
Physical Attractiveness	12.06	5.06	7.17	2.08	-.010	.140	8.50	1.21
Social Competence	14.46	3.63	5.87	2.68	.195	.210	6.90	2.37
Total Aggression	17.87	6.31	1.50	2.45	.360	.341	12.35	3.86
Overt Aggression	9.36	3.47	0.63	1.16	.221	.247	6.66	2.52
Relational Aggression	8.49	3.63	0.88	1.47	.139	.141	5.70	2.08

TABLE 8

R<sup>2</sup> OF MULTIPLE REGRESSIONS USED TO FORM COMPETENCE  
RESIDUALS-YOUNGER COHORT

Domain	Fall 7 <sup>th</sup> Spring 7 <sup>th</sup>		Fall 8 <sup>th</sup> Spring 8 <sup>th</sup>		Fall 9 <sup>th</sup> Spring 9 <sup>th</sup>	
Academic	.26	.25	.24	.19	.16	.14
Behavior	.21	.21	.21	.22	.14	.14
Athletic	.16	.20	.21	.18	.24	.23
Appearance	.02	.02*	.08	.02	.05	.06
Social	.13	.14	.19	.12	.10	.14
Job	.02*	.03*	.01*	.06	.04	.01*
Friend	.08	.08	.07	.09	.07	.06
Intimate	.05	.11	.28	.08	.09	.04

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\* p>.05

TABLE 9  
R<sup>2</sup> OF MULTIPLE REGRESSIONS USED TO FORM COMPETENCE RESIDUALS-  
OLDER COHORT

Domain	Fall 10 <sup>th</sup>	Spring 10 <sup>th</sup>	Fall 11 <sup>th</sup>	Spring 11 <sup>th</sup>	Fall 12 <sup>th</sup>	Spring 12 <sup>th</sup>
Academic	.11	.07	.12	.09	.10	.06
Behavior	.09	.07	.12	.11	.06	.09
Athletic	.41	.25	.24	.24	.32	.25
Appearance	.01*	.01*	.02*	.01*	.02	.01*
Social	.07	.06	.02*	.12	.09	.08
Job	.02*	.08	.06	.06	.01*	.04*
Friend	.02	.02*	.02*	.08*	.00*	.01*
Intimate	.02*	.08	.04	.08	.06	.11

\*p>.05

*Data Reduction* Because fitting models with overestimations in eight domains of competence across 6 waves in two groups would likely become unwieldy, we sought to consolidate the data. We started by conducting an exploratory factor analysis (EFA) of the overestimations of competence. We conducted these analyses on a sub-sample of children who had complete data across all sources of information (parent, teacher, peer, self-report) at any time point in the study. For any given child, we used the first wave of complete data (N=104 for the younger cohort, N=124 for the older cohort). We limited the number of possible factors to those with eigenvalues > 1 (Kaiser, 1960). This yielded one factor in the older cohort and two factors in the younger cohort. Examination of the second factor in the younger cohort revealed that the eigenvalue for the second factor was

only slightly greater than 1 and several cross-loadings made delineation of the second factor difficult. Consequently, we extracted a single factor in both cohorts. Table 10 shows the factor loadings. The only loading less than .40 was for job-related competence in the younger cohort, which may be of minimal importance to 7<sup>th</sup> – 9<sup>th</sup> grade adolescents. Because of the relatively low N obtained by using overestimations relative to parent, teacher, and peer, we conducted a second analysis using overestimations relative to only teacher and peer. Using this inclusion criterion, we obtained an N of 353 for the younger cohort and 314 for the older cohort. We conducted the same procedures as the previous factor analysis and obtained very similar results. A one-factor solution was deemed optimal. Table 11 shows the factor loadings of each domain onto the single factor for both younger and older cohort. Based on these results, we treat the eight domains of overestimation as indices of a single underlying construct during the course of the current study.

TABLE 10  
 FACTOR LOADINGS OF OVERESTIMATIONS OF COMPETENCE DOMAINS  
 RELATIVE TO PARENT, TEACHER, AND PEER LOADING ONTO A SINGLE  
 FACTOR

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Domain	Grades 7-9	Grades 10-12
Academic	<b>.535</b>	<b>.713</b>
Social	<b>.712</b>	<b>.697</b>
Behavior	<b>.449</b>	<b>.553</b>
Athletic	<b>.429</b>	<b>.559</b>
Appearance	<b>.550</b>	<b>.749</b>
Close Friendship	<b>.400</b>	<b>.561</b>
Intimacy	<b>.635</b>	<b>.655</b>
Job	.239	<b>.496</b>

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TABLE 11  
 FACTOR LOADINGS OF OVERESTIMATION OF COMPETENCE DOMAINS  
 RELATIVE TO TEACHER AND PEER ONTO A SINGLE UNDERLYING  
 FACTOR

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Domain	Grades 7-9	Grades 10-12
Academic	<b>.534</b>	<b>.683</b>
Social	<b>.797</b>	<b>.737</b>
Behavior	<b>.413</b>	<b>.554</b>
Athletic	<b>.405</b>	<b>.458</b>
Appearance	<b>.679</b>	<b>.688</b>
Close Friendship	<b>.575</b>	<b>.552</b>
Intimacy	<b>.764</b>	<b>.676</b>
Job	<b>.455</b>	<b>.553</b>

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## **Change in Individual Differences**

In order to examine how change in the rank order of overestimations of competence effects the change in rank order of aggressive behavior (and vice versa) we incorporated these two variables into a structural equations model. We used restricted maximum likelihood (REML) estimation to handle missing data. This procedure allowed us to retain cases with partial data due to the more liberal assumptions about patterns of missingness than are required in traditional procedures such as listwise and pairwise deletion. Procedures such as these have been recommended by McArdle and Hanagami (1991) and implemented by Kraatz-Keiley et al. (2000). We used Arbuckle and Wothke's (1999) AMOS program to conduct this set of analyses. We fit five models, one for each grade level of participants in our study from 7<sup>th</sup> to 11<sup>th</sup> grade. Each model incorporated both fall and spring measurements of both overestimations of competence and aggressive behavior.

Several problems with the data set for the 12<sup>th</sup> grade year rendered the model untestable. One problem involved a procedural error during the collection of data during the spring of the students' 12<sup>th</sup> grade year; teacher reports of aggression were not administered. Consequently, we had only two measures of aggression for 12<sup>th</sup> graders. The second problem resulted from the high dropout rate from the participating high schools; such (nonrandom) attrition from the study resulted in a significantly smaller sample. Attempts to fit the model to these data yielded several out of range estimates and matrices that were not positive definite. For these reasons, we elected to drop the twelfth graders from this analysis.

We formed two latent variables at each wave of the study, one representing overestimations of competence, and another representing aggressive behavior. The overestimation components were formed using a multi-step process. First, children's self-reported competence in each domain was regressed onto teachers' and peers' reports

of that same domain of competence. Parents' reports of competence were not included in the analysis because requiring a parental report of competence for inclusion in this analysis would have severely limited our sample size. Instead of using all 8 manifest variables to estimate the underlying variable, we formed three composite manifest variables based on factor analyses of competence domains conducted in previous research (Cole & White, 1993). One manifest variable represented a "good kid" factor (mean of academic and behavioral competence). Another represented a "popularity" factor (mean of attractiveness, social and athletic competence). The third manifest variable represented a "friendship" factor (mean of close friend and intimate relationship competence). Because of a relatively low response rate on questions concerning job related competence, that domain was not included in these analyses. In subsequent latent variable analyses, these three composites served as indicators of a single latent variable representing the tendency to overestimate.

Once we formed these variables we examined how much overestimations of competence at the fall of each grade predicts aggressive behavior six months later, controlling for prior levels of aggressive behavior. Figure 1 illustrates the model that was used for grades 7-8 and 10-11. The model used for grade nine was identical to the model in Figure 1 except for no measure of teacher rated aggression at time 2. For four of the five analyses, subjects were included if they had data for each manifest variable at at least one time point in the analysis. When we utilized this strategy for the grade seven analysis we were unable to get a good model-fit. We then ran a model that used subjects that had at least one manifest variable for each latent variable in the analyses, and were able to achieve an adequate fit. Table 12 displays the standardized regression weights from the latent variables in the analysis to the manifest variables. Table 13 displays the fit indices for the change in individual difference models. Within these models, we first examined the cross-sectional correlation between the latent variables of aggression and overestimation at time one in each of our models. These correlations ranged from -.02 to

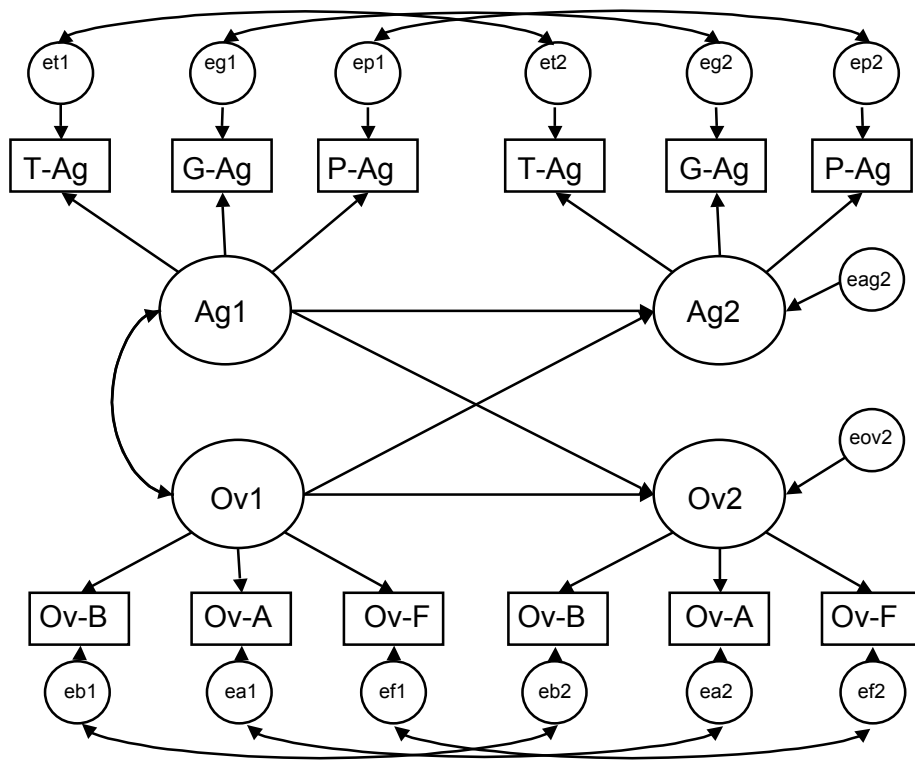


Figure 1. Modeling Change in Individual Differences in the Relation between Overestimations of Competence and Aggressive Behavior

TABLE 12

STANDARDIZED REGRESSION WEIGHTS OF LATENT VARIABLES ONTO  
 MANIFEST VARIABLES FOR THE CHANGE-IN-INDIVIDUAL-DIFFERENCES  
 MODELS FOR FALL/SPRING

Grade	<u>Aggression</u>			<u>Overestimations</u>		
	Parent	Teacher	Peer	Acabeh	Bmoc	Friend
7	.31/.20	.41/.52	.90/.88	.52/.52	.89/.95	.66/.50
8	.06/.18	.45/.49	.93/.86	.55/.59	.92/.96	.55/.64
9	.14/.08	.80/NA	.51/.51	.62/.61	.90/.90	.61/.66
10	.22/.13	.44/.40	.83/.96	.70/.73	.88/.89	.60/.64
11	.49/.39	.59/.54	.59/.60	.60/.62	.96/.98	.60/.60

TABLE 13

GOODNESS-OF-FIT INDICES FOR STRUCTURAL EQUATION MODELS  
 PREDICTING SPRING OVERESTIMATIONS AND AGGRESSIVE BEHAVIOR  
 FROM FALL OVERESTIMATIONS AND AGGRESSIVE BEHAVIOR

Grade	N	Chi-Square	P-value	IFI	RMSEA	PCLOSE
7	371	52.10	.161	1.00	.02	.993
8	278	50.27	.208	1.00	.03	.939
9	413	33.04	.514	1.00	.00	.999
10	445	27.88	.964	1.01	.00	1.00
11	259	79.70	.001	.974	.06	.298

.14 (median = .08). None of these correlations were significantly greater than zero at the  $p < .05$  level. The highest correlation between these two variables occurred in our sample of ninth graders. Given our overall pattern of non-significance, and the fact that our highest correlation occurred at the mid-point of our study, we eschewed formal testing of an increasing trend in the cross-sectional correlations between these variables. We next examined the path coefficients of overestimations of competence in the fall of each grade predicting aggressive behavior in the spring of that same grade. Table 14 displays the path coefficients in these analyses. Overestimations in the fall predicted change in aggression in the spring at only one of the five grades we examined. Next, we examined

the path coefficients of aggressive behavior in the fall predicting overestimations of competence in the spring. Aggression in the fall predicted overestimations in the spring in two of the five grade levels we analyzed. Those predictions, however, were in opposite directions. In sum, there was no consistent evidence to support the notion that individual differences in either overestimation or aggressive behavior predicted changes in the other six months later in our sample of adolescents.

TABLE 14

STANDARDIZED PATH COEFFICIENTS FROM OVERESTIAMTIONS OF  
 COMPETENCE/AGGRESSIVE BEHAVIOR FALL TO OVERESTIMATIONS OF  
 COMPETENC/AGGRESSIVE BEHAVIOR SPRING

Grade	Overestimation to Aggression	Aggression to Overestimation
7	.10*	.03
8	.01	.09*
9	-.08	-.03
10	.03	.04
11	-.12*	.07

\*p<.05

### *Individual Differences in Change*

In contrast to traditional correlational analyses, which examine changes in the rank order of subjects on a given variable, measuring individual differences in change allows researchers to measure the onset, stability, and change over time of given variables for each subject (Nesselroade, 1991; Linn & Slinde, 1977; Bryk & Raudenbush, 1987). Latent growth modeling (Willett & Sayer, 1994) can be used to determine both initial status and rate of change in variables such as aggressive behavior and overestimations of competence.

In the current study, we used a data analytic technique (Factor-of Curves) outlined by Duncan et al. (1999) to investigate the parameters of change in adolescents' overestimations of competence and aggressive behavior. Because of the difficulty of modeling these variables over a six-year (12-wave) time period, and because our study consists of two non-overlapping cohorts, we conducted separate analyses for the two cohorts in our study. The first set of analyses consisted of six time points, one for each semester from grades 7-9. The second set of analyses consisted of six time points, one for each semester from grades 10-12. We again used restricted maximum likelihood (REML) estimation to handle missing data, and conducted the analyses using the AMOS program.

As with the change in individual difference model, we summed the seven overestimation domains (job competence was again excluded) into three manifest variables (good kid, popularity, friendship) at each wave of the study. These manifest variables then were used to form intercept and slope latent variables in a manner consistent with more traditional latent growth curve analyses. Figure 2 illustrates this part of the Factor-of-Curves model. The path coefficients for the slope variable were numbered from 0 to 5 to create a linear trend. Though the linear trends were not significant for every cluster, they nevertheless represent the average change over time of the overestimations of competence for the six waves of our study. In other words, though

the analyses did not inform us about the pattern of change over these six waves, it did inform us about the average change across those waves. From these six latent variables (intercept and slope for the three clusters), we formed two higher order latent variables representing the common intercept and common slope for overestimations of competence. A similar procedure was conducted for reports of aggressive behavior. As illustrated in Figure 3, Latent slopes (with linear trends) and intercepts were formed for self-reported, teacher-reported, and peer-reported aggressive behavior. Each slope consisted of six manifest variables for the self and peer reported aggression and five manifest variables for the teacher reported aggression (due to a clerical error, teacher aggression data was not collected during the last wave of our study.) Two higher order variables were then formed representing the common slope and common intercept of aggressive behavior. This leaves us with four higher order constructs; a common slope and a common intercept for both aggressive behavior and overestimations of competence. Figure 4 illustrates these four higher order constructs. It should be noted that the models that were fitted for each cohort are represented by the combination of Figures 2, 3, and 4. They were separated in this document for the sake of clarity.

In order to obtain a model in which all matrices were positive definite, it was necessary for us to fix the disturbance terms for the intercept and slope of self-reported aggression to zero. For the older cohort, it was only necessary to fix the disturbance term for the slope of self-reported aggression to zero for the same reason. For the younger cohort, the chi-square was 1589.963 ( $df = 568$ ,  $\underline{n} = 560$ ,  $p < .001$ ), the Incremental Fit Index was .92, and the RMSEA was .057. For the older cohort, the Chi-Square was 1013.683 ( $df = 567$ ,  $\underline{n} = 392$ ,  $p < .001$ ), the Incremental Fit Index was .95, and the RMSEA was .045. In order to determine if the initial status (intercept) of either aggressive behavior or overestimations of competence predicted the average change over time (slope) of either of those variables, we examined path coefficients from the common

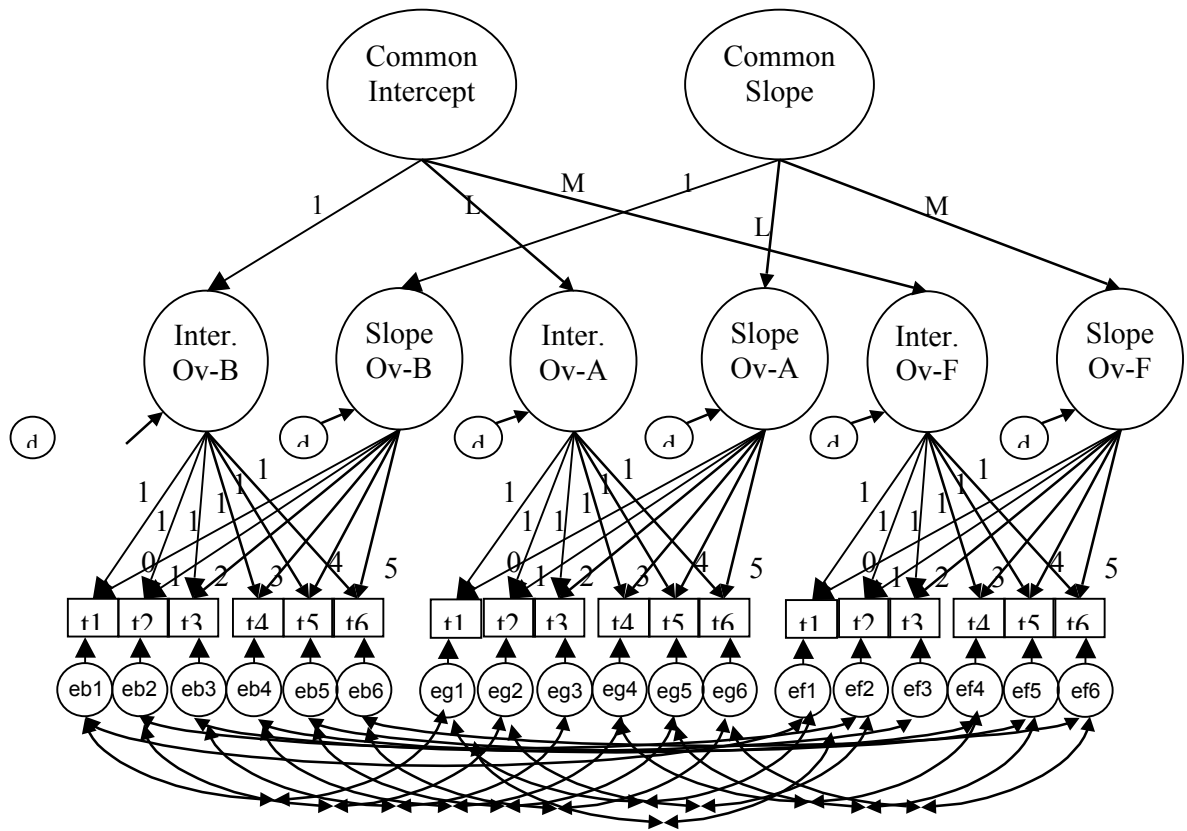


Figure 2. Factor of Curves (FOCUS) Model of Individual Differences in Change of Overestimations of Competence

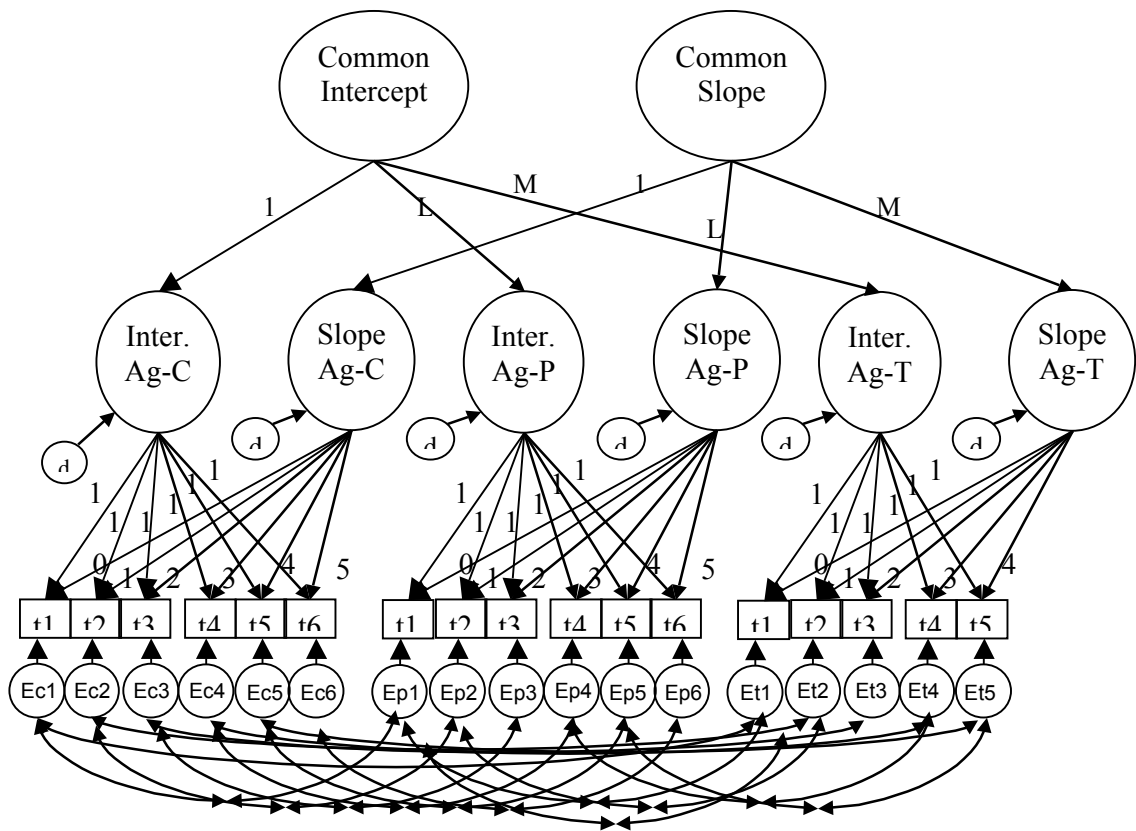


Figure 3 . Factor of Curves (FOCUS) Model of Individual Differences in Change of Aggressive Behavior

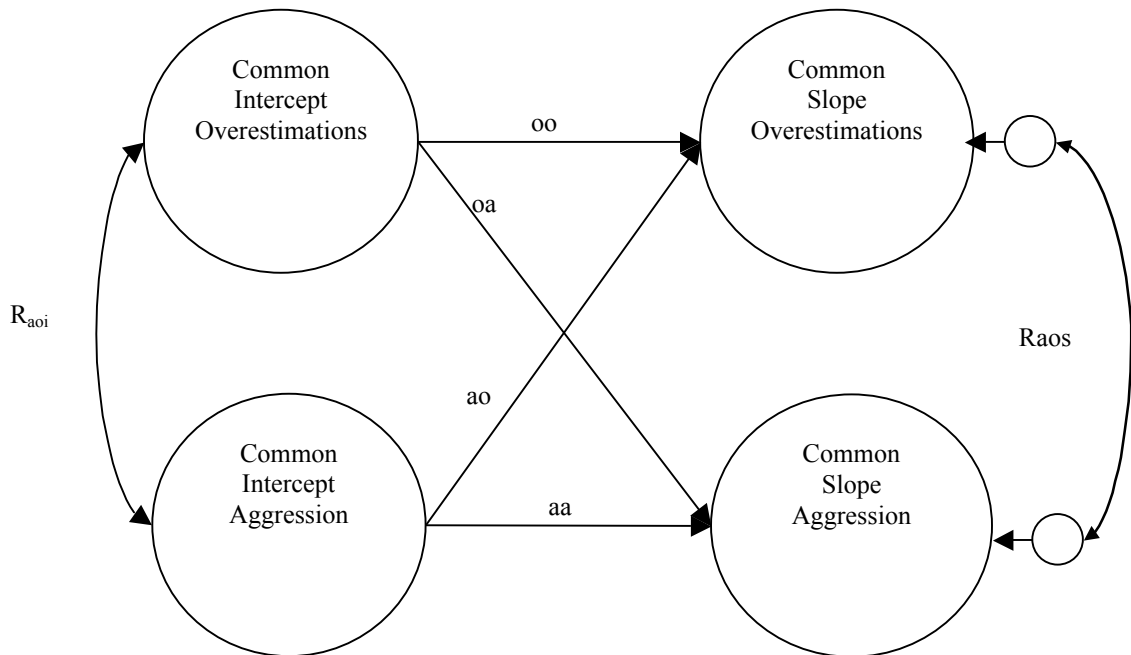


Figure 4. Path Analysis of the relation between Common Intercepts and Slopes of Overestimations of Competence and Aggressive Behavior

intercepts to the common slopes. For the younger cohort, initial status of aggression predicted change of aggression over time with a standardized path coefficient of  $-.24$  ( $p < .05$ ) indicating that the higher the level of aggressive behavior a child displayed at the beginning of seventh grade, the more the child tended to decrease their level of aggression over the span of our study. In a similar fashion, initial status of overestimations predicted change in overestimations with a standardized coefficient of  $-.35$  ( $p < .05$ ). Initial status of overestimations did not predict change in aggressive behavior over time at a level significantly different from zero. Initial status of aggression, however, did predict change over time of overestimations of competence with a standardized path coefficient of  $-.15$  ( $p < .05$ ) indicating that the more aggressive a child was in the fall of 7<sup>th</sup> grade, the more their overestimations of competence decreased between the fall of seventh grade and the spring of ninth grade. This was in the opposite direction of our predicted hypothesis. In the older cohort, the only predictive path between the higher order slopes and intercepts that was significantly different from zero

was the path from initial status of overestimations of competence to slope of overestimations of competence with a standardized coefficient of  $-.38$  ( $p < .05$ ). None of the paths relevant to our predictive hypothesis were significantly different from zero in the older cohort.

*Statistical Power* Because most of our analyses failed to reject the null hypothesis, we conducted a follow-up analysis to determine if we had sufficient statistical power to detect an effect if indeed an effect existed in our sample. The complex nature of our analyses required us to employ an empirical approach to determining power. Using the statistical program Statistica we conducted Monte Carlo analyses based on the parameters of our change-in-individual-differences models. Using this empirical approach, we determined that we had a power of  $.59$  to detect an effect size of  $.10$  in the older cohort and power of  $.69$  to detect an effect in the younger cohort. We ran another set of Monte Carlo analyses to determine the ability to detect an effect size of  $.20$ . Our results indicated a power of greater than  $.99$  for both cohorts. Thus it appears we possessed an adequate sample size to detect a moderate effect in our change-in-individual-differences models. We attempted to conduct a similar analysis for our individual-differences-in-change model but the Statistica program could not run Monte Carlo analyses due to the complexity of the model.

## DISCUSSION

No support emerged from the current study for any of our four hypotheses. First, the study provided no support for the hypothesis that overly positive self-perceptions and aggressive behavior would be positively associated cross-sectionally. Second, the study provided no support for the hypothesis that the relation between overly positive self-perceptions and aggression increases as children progress through adolescence. Third, the results provided no support for the hypothesis that overly positive self-perceptions predict later aggressive behavior. Finally, the results of the current study provided no support for the notion that aggressive behavior predicts later levels of overly positive self-perceptions. Whenever the results of a study fail to reject the null hypothesis, one is forced to consider whether no relation truly exists between the variables under examination or whether certain limitations of the study served to keep that relation from being detected.

Given the lack of quantitative research on the relation between overestimations of competence and aggressive behavior it is fair to consider the possibility that no significant correlation exists between these two variables. Though the arguments put forth in the literature on the relation between these two variables in adults are convincing,

they have yet to be substantiated by quantitative research. The only quantitative study conducted to date concerning these variables was in a sample of elementary children (David & Kistner, 2000). Although the results of that study support a positive relation between overly positive self-perceptions and aggressive behavior, those findings have yet to be replicated. The current study is the only one in the published literature that examines the relation between these two variables in an adolescent population. One must wonder if a file-drawer effect (Smith & Glass, 1977) is at work. Perhaps other researchers have also found no relation between these variables but simply have not published their non-significant results. Whether or not that is the case, it remains clear that the further research is needed before the relation between these two variables is clarified.

Another explanation for the results of the current study is that, as hypothesized, a relation truly exists between overly positive self-perceptions and aggressive behavior in adolescents, but limitations of the current study kept that relation from being revealed. Probably the most common way in which a study may fail to detect an effect that exists in a population is a lack of statistical power. Insufficient statistical power in a given analysis can lead to a failure to detect a significant effect in a sample when in fact a significant effect does exist in the population (Cohen, 1977). Statistical power is a function of sample size, proportion of variance explained, error variance, number of predictors, and alpha level. Given the complexity of the analyses in the current study, we employed an empirical approach to estimating our statistical power. We obtained power of .59 to detect a small effect size of .10 in the older cohort and .69 in the younger cohort. Our power to detect a moderate effect size of .20 was .99 in both cohorts. This level of

power is consistent with commonly accepted levels in previous research, and is not a likely explanation of our inability to detect an effect in the current study.

One limitation that may have hindered the current study was the sample of adolescents that participated. By assessing students who were enrolled in public school, we hoped to study the relation between overly positive self-perceptions and aggressive behavior in a sample that was representative of the entire adolescent population. Indeed, similar research on children had also assessed subjects who were enrolled in public schools (David & Kistner, 2000). As children progress into adolescence, the consequences of their aggressive behavior become more serious. Whereas children who act aggressively will be punished, the punishments are not likely to prevent them from attending school. Suspensions, expulsions, attending alternative schools, incarceration, and long-term residential treatment are all consequences of aggressive behavior that are far more likely to be experienced by adolescents than by children. By choosing to assess adolescents in a school setting we may have excluded some of the most aggressive adolescents in our study. The results of our preliminary analyses also suggest that we may have missed some of the students most likely to overestimate their competence. Those students who participated in our study scored higher on measures of teacher and peer reported competence than did those students not included in our study. One reason for this may be the increase in dropout rate as children progress through adolescence (Kaufman et al., 2000). Obviously by including only students who score relatively high on measures of other-rated competence we observe the relation between overly positive self-perceptions and aggression in a sample that is less prone to receiving the ego-threatening feedback from others that Baumeister (1996) views as critical to the relation

between the two variables. Future research on the relation between these two variables in adolescents should include students who may not be readily available in typical school settings to ensure the relation is observed in a sample that represents the entire spectrum of adolescents.

Another limitation that may have hindered the current study was the instrument with which we chose to measure aggressive behavior. The measures of aggressive behavior were added to a longer longitudinal study when the younger cohort was in seventh grade and the older cohort was in tenth grade. Because the study already consisted of several lengthy measures, we felt using condensed forms of previously used measures was the best way to keep the subjects focused on the questionnaires as well as to keep to a minimum the disruption of the school day during which we conducted the research. Indeed, these abbreviated eight item forms showed good internal consistency as evidenced by our earlier analyses. However, we did not attempt to validate the measures used in the current study against other measures of aggressive behavior. Perhaps limitations of these condensed forms of aggressive behavior measures did not allow the relation between aggressive behavior and overestimations of competence to be revealed in the current study. Future research on the relation between these two variables should incorporate previously validated measures of aggressive behavior.

In conclusion, our study provides no evidence of a significant predictive relation between aggressive behavior and overestimations of competence in adolescents. Because this is the first study that has attempted to quantify this relation in this population, and given the seriousness of the ramifications of aggressive behavior of adolescents in our society, it is clear that further research on this topic is needed. Based on our findings,

future researchers should take care to examine the relation in a population that includes adolescents who display high levels of aggressive behavior. They should also use measures of aggressive behavior that have been previously validated against external sources in a sample of adolescents. Hopefully, these steps will allow future researchers to shed more light onto the relation between these two variables in an adolescent population.

## REFERENCES

- Abramson, L.Y., Seligman, M.E., Teasdale, J.D., (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87(1)*, 49-74.
- Achenbach, T. M. (1991). *Manual for the Child Behavior Checklist/4—18 and 1991 profile*. Burlington: University of Vermont Department of Psychiatry
- Achenbach, T.M., & Edelbrock, C.S. (1983). *Manual for the Child Behavior checklist and Revised Child Behavior Profile*. Burlington, VT: University Associates in Psychiatry.
- Anastas, J.W. and Reinherz, H., 1984. Gender differences in learning and adjustment problems in school: Results of longitudinal study. *American Journal of Orthopsychiatry, 54*, pp. 110 122.
- Anderson, E. (1994). The code of the streets. *Atlantic Monthly, 273 (5)*, 81-94.
- Arbuckle, J.L., & Wothke, W. (1999). *AMOS 4.0 User's Guide*. Chicago: Small Waters.
- Arnett, J.J. (1999). Adolescent Storm and Stress, reconsidered. *American Psychologist, 54*, 317-326.
- Athens, Lonnie H., (1989). *The creation of dangerous violent criminals*. Francis/Routledge. Florence, KY.
- Bargh, J.A., & Tota, M.E. (1988). Context-dependent automatic processing in depression: Accessibility of negative constructs with regard to self but not others. *Journal of Personality and Social Psychology, 54* 925-939.
- Baumeister, R.F., Smart, & Boden, J.M. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Bulletin, 103*, 5-33.

- Beck, A. T. (1963). Thinking and depression: Idiosyncratic content and cognitive distortions. *Archives of General Psychiatry*, 9, 324-333.
- Beck, A. T. (1972). *Depression: Causes and treatment*. Philadelphia: University of Pennsylvania Press.
- Blaine, B., & Crocker, J. (1993). Self-esteem and self-serving biases in reactions to positive and negative events: An integrative review. In R. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp.55-85). New York: Plenum Press
- Bloom, R.B., Shea, R.J. and Eun, B.S., (1979). The Piers-Harris Self-Concept Scale: Norms for behaviorally disordered children. *Psychology in the Schools* 16, pp. 483-487
- Brown, K., Atkins, M.S., Osborne, M.C., & Milnamow. (1996). A revised teacher rating scale for reactive and proactive aggression. *Journal of Abnormal Child Psychiatry*, 24, 473-480.
- Bryk, A., & Raudenbush, S. (1987). Application of hierarchical linear models to assessing change. *Psychological Bulletin*, 101, 147-158.
- Burdett, K. and Jensen, L.C., (1983). The self-concept and aggressive behavior among elementary school children from two socioeconomic areas and two grade levels. *Psychology in the Schools* 20, pp. 370-375
- Buss, A.H. & Durkee, A. (1957). An inventory for assessing different kinds of hostility. *Journal of Consulting Psychology*, 21, 343-349.
- Buss, A.H. & Perry, M. (1992). The aggression questionnaire. *Journal of Personality & Social Psychology*, 63, 452-459.
- Cairns, R.B., Cairns, B.D., Neckerman, H.J., Ferguson, L.L. and Gariépy, J.L., 1989. Growth and aggression: I. Childhood to early adolescence. *Developmental Psychology*, 25, pp. 320-330.
- Cohen, J. (1977 reprinted 1987). *Statistical Power Analysis for the Behavioral Sciences*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Coie, J.D., Dodge, K.A., & Capotelli, H. (1982). Dimensions and types of social status in the school: A cross-age comparison. *Child Development*, 59, 815-829.
- Cole, D. A. (1990). Relation of social and academic competence to depressive symptoms in childhood. *Journal of Abnormal Psychology*, 99, 422-429.
- Cole, D.A., (1991). Preliminary support for a competency-based model of depression in children. *Journal of Abnormal Psychology*, 100, 181-190.

- Cole, D.A., & Carpentieri, S. (1990). Social status and the comorbidity of child depression and conduct disorder. *Journal of Consulting and Clinical Psychology, 58*(6), 748-757.
- Cole, D. A., Gondoli, G. & Peeke, L. G. (1997). Structure of parent and teacher perceptions of children's competence: A multitrait, multimethod, multigroup investigation. *Psychological Assessment.*
- Cole, D.A., Martin, J.M., & Powers, B. (1997). A competency-based model of child depression: A longitudinal study of peer, parent, teacher, and self-evaluations. *Journal of Child Psychology and Psychiatry, 38*(5), 505-514.
- Cole, D. A., Martin, J. M., Peeke, L., Seroczynski, A. D., & Hoffman, K. B. (1998). Are negative cognitive errors predictive or reflective of depressive symptoms in children: A longitudinal study. *Journal of Abnormal Psychology, 107*(3), 481-496.
- Cole, D.A., Martin, J.M., Peeke, L.G. & Truglio, R. (1996). Modeling Causal relations between academic and social competence and depression. A multitrait-multimethod longitudinal study of children. *Journal of Abnormal Psychology, 105*(2), 258-270.
- Cole, D.A., Maxwell, S.E., Martin, J.M., Peeke, L.G., Seroczynski, A.D., Tram, J.M., Hoffman, K.B., Ruiz, M.D., Jacquez, F., Maschman, T. (2001). The development of multiple domains of child and adolescent self-concept: A cohort sequential longitudinal design. *Child Development, 72*(6), 1723-1746.
- Cole, D.A. & White, K. (1993). Structure of peer impressions of children's competence: Validation of the peer nomination of multiple competencies. *Psychological Assessment, 5*, 449-458.
- Cole, E. and Kumchy, C.I.G., 1981. The CIP battery: Identification of depression in a juvenile delinquent population. *Journal of Clinical Psychology, 18*, pp. 880-884
- Colvin, R.C., Block, J., & Funder, D.C. (1995). Overly positive self-evaluations and personality; Negative implications for mental health. *Journal of Personality and Social Psychology, 68*(6), 1152-1162.
- Connell, J., & Ilardi, B. (1987). Self-system concomitants of discrepancies between children's and teachers' evaluations of academic competence. *Child Development, 58*, 1297-1307.
- Crick, N.R., & Grotpeter, J.K. (1995). Relational aggression, gender, & social-psychological adjustment. *Child Development, 66*, 710-722.

- David, C.F., & Kistner, J.A., (2000). Do positive self-perceptions have a “dark side”? Examination of the link between perceptual bias and aggression. *Journal of Abnormal Child Psychology*, 28(4), 327-337.
- De La Ronde, C., & Swann, W.B. (1993). Caught in the crossfire: Positivity and self-verification strivings among people with low self-esteem. In R. Baumeister (Ed.), *Self-esteem: The puzzle of low self-regard* (pp. 147-165). New York: Plenum Press.
- Duncan, T.E., Duncan, S.C., Strycker, L.A., Li, F. & Alpert, A. (1999). *An Introduction to Latent Variable Growth Curve Modeling*. Mahwah, NJ: Erlbaum Publishers.
- Eccles, J.E., Adler, T.R., Futterman, R., Goff, S.B., Kacazla, C.M., Meece, J., & Midgley, C. (1983). Expectancies, values and academic behaviors. In J.T. Spence (Ed.), *Achievement and achievement motives* (pp.75-146). San Francisco: W.H. Freeman.
- Eccles, J.E., Wigfield, A., Flanagan, C. A., Miller, C., Reuman, D.A., & Yee, d. (1989). Self-Concepts, domain values, and self-esteem: Relations and changes at early adolescence. *Journal of Personality*, 57, 283-310.
- Eccles, J.S., Wigfield, A., Harold, R.d., & Blumenfeld, P. (1993). Age and gender differences in children’s self-and task perceptions during elementary school. *Child Development*, 64, 830-847.
- Edens, J.F., (1999). Aggressive children’s self-systems and the quality of their relationships with significant others. *Aggression and Violent Behavior*, 4(2), 151-177.
- Elliott, D. S., Ageton, S. S., Huizinga, D., Knowles, B. A. & Canter, R. J. (1983). The prevalence and incidence of delinquent behavior, 1976—1980: *National estimates of delinquent behavior by sex, race, social class, and other selected variables*. National Youth Survey Report No. 26. Boulder, CO: Behavioral Research Institute
- Fiske, S.T., & Taylor, S.E. (1984). *Social Cognition*. Reading, MA: Addison-Wesley.
- Glueck, S., & Glueck, E.T. (1950). *Unraveling juvenile delinquency*. Cambridge, MA: Harvard University Press.
- Goffman, E. (1967). *Interaction Ritual*. Newport Beach, CA: Westcliff.
- Greenwald, A.G. (1980). The totalitarian ego: Fabrication and revision of personal history. *American Psychologist*, 35 603-618.

- Grisso, T. (1998). *Forensic Evaluation of Juveniles*. Sarasota, FL: Professional Resource Press.
- Hagga, D.A.F. & Beck, A. (1995). Perspectives on depressive realism: Implications for cognitive theory of depression. *Behaviour Research and Therapy*, *33*(1), 41-48.
- Harter, S. (1982). The Perceived Competence Scale for Children, *Child Development*, *53*(1), 87-97.
- Harter, S. (1985). *Manual for the Self-Perception Profile for Children*. Denver, CO: University of Denver.
- Harter, S. (1988). *Manual for the Self-Perception Profile for Adolescents*. Denver, CO: University of Denver.
- Harter, S. (1990). Causes, correlates, and the functional role of global self-worth. A life-span perspective. In R.J. Sternberg & J. Kolligan, Jr. (Eds.), *Competence considered* (pp. 67-09). New Haven: Yale University Press.
- Harter, S. (1998). The development of self-representations. In W. Damon (Series Ed.) and N. Eisenberg (Ed.), *Handbook of child psychology (5<sup>th</sup> ed., vol. 3): Social, emotional, and personality development*. New York: Wiley.
- Hoge, D.R., Smit, E.K., & Hanson, S.L. (1990). School experiences predicting changes in self-esteem of sixth- and seventh-grade students. *Journal of Educational Psychology*, *82*, 117-127.
- Howell, J., Krisberg, B., Hawkins, J., & Wilson, J. (Eds.). (1995). *A Sourcebook: Serious, Violent, and Chronic Juvenile Offenders*. Thousand Oaks, CA: Sage.
- Hughes, J.N., Cavell, T.A. and Grossman, P.B., 1997. A positive view of self: Risk or protection for aggressive children? *Development and Psychopathology*, *9*, pp. 75-94
- Hymel, S., Bowker, A. and Woody, E., 1993. Aggressive versus withdrawn unpopular children: Variations in peer and self-perceptions in multiple domains. *Child Development* *64*, pp. 879-896.
- Hymel, S., Rubin, K.H., Rowden, L. and LeMare, L., 1990. Children's peer relationships: Longitudinal prediction of internalizing and externalizing problems from middle to late childhood. *Child Development*, *61*, pp. 2004-2021.
- Jankowski, M.S. (1991). *Islands in the street: Gangs and American Urban Society*. Berkeley: University of California Press.

- Kaufman, P., Kwon, J. Y., Klein, S., & Chapman, C. D. (2000). Dropout Rates in the United States, 1999, NCES 2001-022. Washington, DC: Department of Education, National Center for Education Statistics. .
- Kazdin, A.E., Rodgers, A., Colbus, D. & Siegel, T. (1987). Children's hostility inventory: Measurement of Aggression & hostility in psychiatric inpatient children. *Journal of clinical Child Psychology, 16*, 320-328.
- Kernis, M.H., Grannemann, B.D., & Barclay, L.C., (1989). Stability and level of self-esteem as predictors of anger arousal and hostility. *Journal of Personality and Social Psychology, 56(6)*, 1013-1022.
- Kobak, R.R. and Sceery, A., 1988. Attachment in late adolescence: Working models, affect regulation, and representations of self and others. *Child Development, 59*, pp. 135-146.
- Kraatz Keiley, M., Bates, J.M., Dodge, K.A., & Petit, G.S., (2000). A cross-domain growth analysis: Externalizing and Internalizing Behaviors During 8 years of childhood. *Journal of Abnormal Child Psychology, 28(2)*, 161-179.
- Kuiper, N. & Derry, P. (1982). Schematic processing and self-reference in clinical depression. *Journal of Abnormal Psychology, 90*, 286-297.
- Kuper, N.A., Olinger, L.J., MacDonald, M.R., & Shaw, B.F. (1985). Self-schema processing of depressed and nondepressed content: The effects of vulnerability on depression. *Social Cognition, 3* 77-93.
- Kupersmidt, J.B., & Patterson, C.J., (1991). Childhood peer rejection, aggression, withdrawal, and perceived preadolescence. *Journal of Abnormal Child Psychology, 19(4)*, 427-449.
- Lagerspetz, K.M.J., Bjorkqvist, K. & Peltonen, T. (1988). Is indirect aggression typical of females? Gender differences in aggressiveness in 11- to 12-year old children. *Aggressive Behavior, 14*, 403-414.
- Lahey, B.B., Miller, T.L., Schwab-Stone, M., Goodman, S.H., Waldman, I.D, Canino, G., Rathouz, P.J., Dennis, K.D., Bird, H., Jensen, P.S. (2000). Age and gender differences in oppositional behavior and conduct problems: A cross-sectional household study of middle childhood and adolescence. *Journal of Abnormal Psychology, 109(3)*. 488-503.
- Levin, J. & McDevitt, J. (1993). *Hate Crimes: The Rising Tide of Bigotry and Bloodshed*. New York: Perseus Books Group.

- Linn, R.L. & Slinde, J.A., (1977). The determination of the significance of change between pre- and posttesting periods. *Review of Educational Research*, 47(1), 121-150.
- Lochman, J.E. and Dodge, K.A., 1994. Social-cognitive processes of severely violent, moderately aggressive, and nonaggressive boys. *Journal of Consulting and Clinical Psychology*, 62, pp. 366-374.
- Lochman, J.E. and Lampron, L.B., 1986. Situational social problem-solving skills and self-esteem of aggressive and nonaggressive boys. *Journal of Abnormal Child Psychology*, 14, pp. 605-617.
- Loeber, R., Farrington, D. P., Stouthamer-Loeber, M. & van Kammen, W. (1998). *Antisocial behavior and mental health problems: Explanatory factors in childhood and adolescence* (Hillsdale, NJ: Erlbaum)
- Long, D.E. (1990). *The anatomy of terrorism*. New York: Free Press.
- MacDonald, J.M. (1975). *Armed Robbery: Offenders and their victims*. Springfield, IL: Charles C. Thomas.
- Marsh, H.W. (1989). Age and sex effects in multiple dimensions of self-concept: Preadolescence to early adulthood. *Journal of Educational Psychology*, 81, 417-430.
- Marsh, H.W., Craven, R., & Debus, R. (1998). Structure, stability, and development of young children's self-concepts: A multicohort-multioccasion study. *Child Development*, 69, 1030-1053.
- McArdle, J.J., & Hamagami, F. (1991). Modeling incomplete longitudinal and cross-sectional data using latent growth structural models. In L.M. Collins & J.L. Horn (Eds.), *Best methods for the analysis of change*. Washington, DC: American Psychological Association.
- McKeough, A., Yates, T. and Marini, A., 1994. Intentional reasoning: A developmental study of behaviorally aggressive and normal boys. *Development and Psychopathology*, 6, pp. 285-304.
- Moffitt, T. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 674-701.
- Nesselroade, J.R. (1991). Interindividual differences in intraindividual change. In L. Collins & J. Horn (Eds.), *Best methods for the analysis of change: Recent advances, unanswered questions, future directions*. Washington DC: American Psychological Association.

- Nisbett, R.E. & Ross, L. (1980). *Human inference: Strategies and shortcomings of social judgement*. Englewood Cliffs, NJ: Prentice-Hall.
- Panak, W.F. and Garber, J., 1992. Role of aggression, rejection, and attributions in the prediction of depression in children. *Development and Psychopathology*, 4, pp. 145-165.
- Patterson, C.J., Kupersmidt, J.B., & Griesler, P.C., (1991). Children's perceptions of self and of relationships with others as a function of sociometric status. *Child Development*, 61(5), 1335-1349.
- Pedersen, W. & Wichstrom, L. (1995). Patterns of delinquency in Norwegian adolescents. *British Journal of Criminology*, 35, 543-562.
- Rehm, L. P. (1977). A self-control model of depression. *Behavior Therapy*, 8, 787-804.
- Renzetti, C.M., (1992). *Violent betrayal: Partner abuse in lesbian relationships*. Newbury Park, CA: Sage.
- Sackeim, H.A., (1983). Self-deception, self-esteem, and depression: The adaptive value of lying to oneself. In J.I Masling (Ed.), *Empirical studies of psychoanalytical theories* (Vol. 1, pp. 101-157). Hillsdale, NJ: Analytic Press.
- Salmivalli, C., Kaukiainen, A., Kaistaniemi, L., & Lagerspetz, K.M.J., (1999). Self-evaluated self-esteem, peer-evaluated self-esteem, and defensive egotism as predictors of adolescents' participation in bullying situations. *Personality and Social Psychology Bulletin*, 25(10), 1268-1278.
- Schaughency, E., Frame, C.L. and Strauss, C.C., (1987). Self-concept and aggression in elementary school students. *Journal of Consulting and Clinical Psychology* 16, pp. 116-121.
- Schneider, M.J. and Leitenberg, H., (1989). A comparison of aggressive and withdrawn children's self-esteem, optimism and pessimism, and causal attributions for success and failure. *Journal of Abnormal Child Psychology*, 17, pp. 133-145.
- Segal, Z.V. (1988). Appraisal of the self-schema construct in cognitive models of depression. *Psychological Bulletin*, 103, 147-162.
- Shavelson, R.J., Hubner, J.J., & Stanton, G.C. (1976). Validation of construct interpretations. *Review of Educational Research*, 46, 407-441.

- Shirk, S.R. and Renouf, A.G., 1992. The tasks of self-development in middle childhood and early adolescence. In: Lipka, R.P. and Brinthaupt, T.M. Editors, 1992. *Self-perspectives across the life span* State University of New York Press, Albany, pp. 53-90
- Slaby, R.G., & Guerra, N.G. (1988). Cognitive mediators of aggression in adolescent offenders: I. Assessment. *Developmental Psychology*, 24(4). 580-588.
- Sroufe, A.L., (1997). Psychopathology as an outcome of development. *Development and Psychopathology*, 9(2). 251-268.
- Sroufe, A.L., & Rutter, M. (1984). The domain of developmental psychopathology. *Child Development*, 55(1). 17-29.
- Staub, E. (1989). *The roots of evil: The origins of genocide and other group violence*. New York and Cambridge, England: Cambridge University Press.
- Svenson, O. (1981). Are we all less risky and more skillful than our fellow drivers? *Acta Psychologica*, 47, 143-148.
- Swann, W.B. (1987). Identity negotiation: Where two roads meet. *Journal of Personality and Social Psychology*, 53 1038-1051.
- Taylor, S.E., (1983). Adjustment to threatening events: A theory of cognitive adaptation. *American Psychologist*, 38, 1161-1173.
- Taylor, S.E., (1989). *Positive Illusions: Creative Self-Deception and the Healthy Mind*. New York: Basic Books.
- Taylor, S.E., & Brown, J.D., (1988). Positive illusions and well-being revisited: Separating fact from fiction. *Psychological Bulletin*, 103, 193-210.
- Wichstrom, L. (1995). Harter's Self-Perception Profile for Adolescents: Reliability, validity, and evaluation of the question format. *Journal of Personality Assessment*, 65(1), 100-116.
- Wigfield, A., Eccles, J.S., MacIver, D., Reuman, D.A., et al., (1991). Transitions during early adolescence: Changes in children's domain-specific self-perceptions and general self-esteem across the transition to junior high school. *Developmental Psychology*, 27(4), 552-565.
- Wigfield, A. (1994). Expectancy value theory of achievement motivation: A developmental perspective. *Educational Psychology Review*, 6, 49-78.

- Wigfield, A., Eccles, J.S., Yoon, K.S., Harold, R.D., Arbeton, A.J.A., Freedman doan, C., & Blumenfeld, P.C. (1997). Change in children's competence beliefs and subjective task values across the elementary school years: A 3-year study. *Journal of Educational Psychology, 89*, 451-469.
- Willet, J.B., & Sayer, A.G. (1994). Using covariance structure analysis to detect correlates and predictors of individual change over time. *Psychological Bulletin, 116*, 363-381.
- Wylie, R.C. (1979). *The self-concept: Vol 2. Theory and research on selected topics* (rev. ed.). Lincoln, Nebraska: University of Nebraska Press.
- Zakriski, A.L., & Coie, J.D., (1996). A comparison of aggressive-rejected and nonaggressive-rejected children's interpretations of self-directed and other-directed rejection. *Child Development, 67*(3). 1048-1070.