The Nature of Self-Representations Related to Physical Activity in Adolescence

by

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This dissertation is dedicated to my loving husband and fellow Wolverine,

Bradford S. Moyer

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ABSTRACT

Background: There is a concerning decline in physically active behavior across adolescence. Evidence suggests that self-schemas, or cognitive representations about the self, are important motivators and regulators of physically active behavior. The relationship between physical activity and self-representation in adolescence, however, is not well understood.

Purpose: The purpose of this study was to investigate the nature of self-representations that distinguish adolescents who engage in high levels of physical activity from those who are less active.

Methods: This qualitative descriptive study was a secondary analysis of data from 158 eighth grade, Midwest adolescents. Adolescents generated sets of self-descriptive words and phrases in the *All About Me* task, an open-ended survey designed to elicit thoughts about the self. Participants completed the task twice, once in the eighth and ninth grades. Participants completed the *Child/Adolescent Activity Log,* a diary-style measure of physical activity, five times across the two year study. Physical activity data were used to divide participants into two groups. Adolescents were considered physically active if they engaged in an average of 60 minutes or more of moderate-vigorous behavior each day. The content and structure of adolescent self-representations were analyzed in a four-stage process that included: (a) reading sets of adolescent self-descriptors in entirety, (b) completing a paired comparison of individual self-descriptors, (c) creating descriptive case grids, and (d) creating descriptive category matrices.

Findings: Results of this study suggested that adolescents used self-descriptors in common contextual, behavioral, and relational domains. Based on these three categories, seven patterns of self-representation that distinguished between active and not active adolescents were identified. Physically active adolescents tended to use self-descriptors explicit to organized sport. Active behavior was also associated with highly differentiated patterns of self-representation that included engagement in multiple activities, relationships, and social roles. Low levels of physical activity were associated with patterns of self-representation that included fewer domains of self-description and often one or more categories of self-description were absent.

Conclusion: There are patterns of self-representation that distinguish physically active from not active adolescents. Physically active behavior is associated with patterns of general adolescent engagement. Interventions may need to address broader issues of engagement.

Chapter I

Introduction

Nurses, beginning with those in nineteenth century public health nursing, have long provided education and services to promote and maintain the health of individuals and communities. National attention to these objectives, with increased awareness of rising healthcare costs, lends opportunity for collaboration among disciplines in health promotion and disease prevention efforts (Society for Adolescent Medicine, 2006; 2000). The challenge to promote healthy lifestyle choices is fueled by an understanding that health behavior and personal decision-making play a central role in preventing morbidity and mortality.

Few subjects have sparked more attention than the role that physical activity plays in achieving and maintaining health. Given the health-related consequence of youth inactivity (Budd & Hayman, 2008; Centers for Disease Control and Prevention, 2004; Oldridge, 2008) and climbing obesity rates among adolescents in the United States (Centers for Disease Control and Prevention, 2006; Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008), there is pressure to increase physical activity in this population. The difficulty in achieving that goal is the focus of much professional discourse.

Children and adolescents are currently more physically active than adults (Janz, Dawson, & Mahoney, 2000; Sigmund, De Ste Croix, Miklankova, & Fromel, 2007),

however, there is a well-established negative relationship between physical activity levels and age during adolescence (Allison et al., 2005; Butcher, Sallis, Mayer, & Woodruff, 2008). Efforts to halt developmental decline and increase levels of physical activity have resulted in modest and inconsistent outcomes (van Sluijs, McMinn, & Griffin, 2008); and attempts to promote adherence to behavior change have been largely unsuccessful (Nigg, Borrelli, Maddock, & Dishman, 2008).

Self-schema theory, a cognitive model of the self described by Markus (1977), has been proposed as a perspective that might better support these behavioral objectives (Kendzierski, 1988, 1990). As stable cognitive structures that process domain relevant information and motivate and direct related behavior, (Corte & Stein, 2007; Markus, 1977; Markus & Nurius, 1986; Oyserman, Brickman, & Rhodes, 2007; Petersen, Stahlberg, & Dauenheimer, 2000; Stein & Corte, 2007), it is plausible that promoting development and maintenance of activity-related schemas would prevent the typical decline of physically active behavior in adolescence (Dowda, Dishman, Pfeiffer, & Pate, 2007; Kahn et al., 2008). In fact, previous research has established the presence of physically active self-schemas that are related to increased levels of active behavior (Kendzierski, 1988).

Adolescence, however, is a time of immense growth and change in the self that occurs in a complex process of identity formation (Erikson, 1968). Theories of adolescent identity describe these transitions of adolescence and, when considered in concert with schema theory, provide a developmental perspective to study of adolescent self-representation. It is largely unknown if promoting the development of activity related schemas is a reasonable goal during this unique period of development. Study of

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adolescent physical activity from a self-schema perspective depends on an accurate and developmentally sensitive understanding of the relationship between adolescent self-representation and physically active behavior.

Purpose/Specific Aims

The purpose of this study, therefore, was to investigate the nature and content of self-representations that distinguish adolescents who engage in high levels of physical activity from those who are less active. Two specific aims were addressed, including (a) to describe the general content of self-representations of adolescents across the transition from middle to high school, and (b) to identify patterns of self-representation that distinguish adolescents by physical activity level, gender, and age.

Chapter II

Review of Literature

The association between an active adolescent lifestyle and physical and emotional health has been a major focus of health promotion research for the past three decades. Its relationship with cognitions about the self is a newer phenomenon, but one that has received considerable attention in the literature. This review of literature will first provide a comprehensive overview of what is currently known about adolescent physical activity, including: (a) the health-related outcomes of adolescent physical activity, (b) epidemiological patterns of adolescent physical activity behavior, and (c) known determinants of adolescent physical activity. Second, physically active self-schemas and the more general self-schema theory will be presented as a theoretical approach that holds promise for researchers and clinicians trying to understand and promote physically active behavior in adolescents. Finally, literature from adolescent identity theory will be reviewed to provide a developmental context for understanding the relationship between physical activity and self-representation in adolescence.

Adolescent Physical Activity

Health-Related Outcomes of Adolescent Physical Activity

Multiple pathways linking adolescent physical activity and health outcomes have been established (Malina, 2001). Physical activity in adolescence affects not only the immediate health and fitness of youth, but also later adult health by decreasing cumulative risk for chronic disease and by providing a foundation of healthy behavior

that tracks from adolescence into adulthood (Hallal, Victora, Azevedo, & Wells, 2006). A latent, direct effect of adolescent physical activity on adult health has also been proposed (Malina, 2001), but research for this last effect is limited (Sacker & Cable, 2005).

Adolescent physical activity and adolescent health. Studies have shown that physical activity in adolescence is protective against adolescent weight gain and obesity (Must & Tybor, 2005), improves cardiovascular health (Boreham, Twisk, Savage, Cran, & Strain, 1997; Gidding et al., 2006; Mark & Janssen, 2008), increases bone mass density (French, Fulkerson, & Story, 2000; Ondrak & Morgan, 2007) and lean body mass (Baxter-Jones, Eisenmann, Mirwald, Faulkner, & Bailey, 2008), and improves psychological health (Field, Diego, & Sanders, 2001; Parfitt & Eston, 2005; Rothon et al., 2010; Schmalz, Deane, Birch, & Davison, 2007).

Obesity is a predominant threat to adolescent health (Jasik & Lustig, 2008), and like many acute health conditions, has a relationship with physically active behavior. The prevalence of obesity and related sequelae have nearly tripled among American adolescents since 1970 and continue to rise (Centers for Disease Control and Prevention, 2006). A combination of metabolic and behavioral factors makes adolescence a particularly vulnerable time for weight gain. While it is generally accepted that physical activity is an important component of obesity prevention and treatment, this relationship is complicated during adolescence. Obesity is considered both a determinant and an outcome of physically active behavior, and the influence of one on the other is not completely understood (McMurray, Harrell, Creighton, Wang, & Bangdiwala, 2008). However, in their review of 20 prospective studies of youth physical activity and weight,

Must and Tybor (2005) found a relatively consistent inverse relationship between physical activity and obesity. Challenges related to physical activity measurement and sample selection are frequently cited rationale for null findings and inconsistencies across studies (Must & Tybor, 2005). Additional longitudinal research is needed to refine scientific understanding of the link between physical activity and adolescent weight gain.

Relationships between physical activity and other adolescent health outcomes are more conclusive. For example, Baxter-Jones et al. (2008) analyzed data from 222 adolescents to examine the relationship between youth activity and lean body mass. In their study, physical activity was measured 17 times over seven years with a self-report questionnaire. Additional data regarding adolescent lean body mass were obtained with biannual total body scans. Using multi-level random effect models, the investigators found that an increase of one standard deviation in the physical activity score resulted in a 344-gram increase in lean mass for boys and a 218-gram increase for girls. After controlling for growth and maturation, adolescent physical activity was determined to be a significant, independent predictor of lean body mass. This relationship demonstrates an immediate effect of physical activity on adolescent health.

Adolescent physical activity and health risk profiles. There is also evidence that adolescent physical activity decreases risk factors for chronic disease (Ondrak & Morgan, 2007; Pan & Pratt, 2008; Rizzo, Ruiz, Oja, Veidebaum, & Sjostrom, 2008). The presence of metabolic syndrome in adolescents, for example, is a risk factor for heart disease and diabetes that is of recent concern among researchers and clinicians (Brambilla, Pozzobon, & Pietrobelli, 2011). Metabolic syndrome is generally defined as the presence of three or more of the following pathophysiologic conditions: waist circumference greater than the 90th percentile, fasting blood glucose greater than 100mg/dL, triglycerides greater than 110 mg/dL, high-density lipoprotein

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cholesterol (HDL-C) less than 35 mg/dL, and blood pressure greater than the 90th percentile (Pan & Pratt, 2008). Analysis of data from 4,450 adolescents who participated in the National Health and Nutrition Examination Survey, revealed that each component of metabolic syndrome was lower among adolescents with high levels of physical activity (Pan & Pratt, 2008). While these results are encouraging, a causal effect cannot be established with the cross-sectional data described here. Brambilla (2007) also cautions that conclusions should remain guarded since early definitions of metabolic syndrome have been adapted from adult criteria that may be ill-defined for younger populations.

Longitudinal evidence demonstrating the effects of youth behavior on developing adult risk is convincing (Hernelahti et al., 2004; Li et al., 2003; Moore et al., 2008; Sacker & Cable, 2005). For example, Li et al. (2003) analyzed data from 486 adults who participated in the longitudinal Bogalusa Heart Study between 1973 and 1996. Serial physiologic measures, beginning in childhood, were conducted to examine the cumulative burden of cardiovascular disease risk. Analyses revealed that low-density lipoprotein cholesterol (LDL-C) level and body mass index (BMI) in childhood were independent predictors of increased measures of carotid intima-media thickness in asymptomatic young adults. From these findings, it makes intuitive sense that decreasing LDL-C and BMI in childhood might lead to a decrease or delay in adult cardiovascular disease. With advancing technology, researchers have just begun to document the relationship between physically active behavior in youth and the incidence of adult disease by way of risk factor development.

Adolescent physical activity as a foundation for adult behavior. Adolescent physical activity also impacts adult disease by creating a foundation of healthy behavior that remains relatively stable from late adolescence into adulthood (Cleland, Dwyer, &

Venn, 2008; Gordon-Larsen, Nelson, & Popkin, 2004; Matton et al., 2006; Paavola, Vartiainen, & Haukkala, 2004; Raudsepp & Viira, 2008; vanMechelen, Twisk, Kemper, Snel, & Post, 1999). Janz, Dawson, and Mahoney (2000) studied the physically active behavior, sedentary behavior, and physical fitness of 126 adolescents over five years. They found that physical fitness and behavior tracked significantly in all measured parameters of this longitudinal study. Confirming these results, Paavola et al. (2004) studied the smoking, drinking, and physically active behavior of 640 study participants at ages 15, 21, and 28. Analyses of self-reported behaviors led researchers to conclude that physical activity was stable over time. Physical activity at age 28 was significantly correlated to physically active behavior at age 21 and age 15. These studies suggest that adolescents who establish regular patterns of physical activity may demonstrate similar behavior in adulthood. Given enduring behavior, the importance of regular physical activity in adolescence becomes obvious for achieving and maintaining health in people of all ages.

Epidemiological Patterns of Adolescent Physical Activity

Reports are inconsistent with regard to the precise timing of the decline, but there is considerable support for a systematic reduction in physically active behavior across adolescence, between the ages of 11 and 17 (Allison et al., 2005; Babey, Hastert, Yu, & Brown, 2008; Brodersen, Steptoe, Boniface, & Wardle, 2007; Butcher et al., 2008; Kahn et al., 2008; Nader, Bradley, Houts, McRitchie, & O'Brien, 2008). The decline is generally described as linear in nature (Allison et al., 2005; Brodersen et al., 2007; Nader et al., 2008), but Kahn (2008) also reported a quadratic relationship. Irrespective of the trajectory, levels of physical activity by late adolescence fall far short of those prescribed

in national health objectives. Studies have shown that by 12th grade only 29.5% of adolescents are moderately to vigorously active for 60 minutes on five or more days of the week, and 28.9% do not participate in 60 minutes or more on even one day of the week (Centers for Disease Control and Prevention, 2008).

Determinants of Adolescent Physical Activity

      Demographic determinants. Levels of physical activity deteriorate among gender and socioeconomic subgroups of the adolescent population (Centers for Disease Control and Prevention, 2008). Adolescent girls are less active than boys (Armstrong, Welsman, & Kirby, 2000; Brodersen et al., 2007; Centers for Disease Control and Prevention, 2008; Nader et al., 2006; Nelson, Neumark-Stzainer, Hannan, Sirard, & Story, 2006; Wickel & Eisenmann, 2007) and adolescents who reside in low socioeconomic conditions are less active than those who live in more privileged circumstance (Butcher et al., 2008). Butcher et al. (2008) documented the relationship between gender, socioeconomic status (SES) and physical activity in a cross-sectional study of 6125 adolescents. Using accelerometery as an objective measure of active behavior, Butcher et al. found significant differences in guideline compliance among subgroups of their 14 to 17 year old sample. Fifty-seven percent of the male and 40% of the female adolescents engaged in recommended levels of physical activity. Adolescents from households with greater than $60,000 income were more likely to comply with physical activity guidelines than those with incomes less than $40,000. Activity levels have also been shown to vary by ethnicity (Centers for Disease Control and Prevention, 2008; Dugas et al., 2008; Singh, Yu, Siahpush, & Kogan, 2008) however, this effect is likely confounded by SES and sampling bias (Butcher et al., 2008).

Modifiable determinants. Demographic correlates of physical activity, like gender, age, and SES, while useful in identifying at-risk adolescents, are not readily amenable to change. More modifiable determinants of physical activity are of great interest, since they represent an opportunity for targeted intervention (Sallis et al., 2002). While a variety of such variables have been identified, most often cited are: (a) social-relational factors, such as parental socialization (King, Tergerson, & Wilson, 2008; Pugliese & Tinsley, 2007), peer support (Voorhees et al., 2005), and recently pet ownership (Sirard, Patnode, Hearst, & Laska, 2011), (b) environmental factors, such as neighborhood characteristics (Kim, Liu, Colabianchi, & Pate, 2010; Molnar, Gortmaker, Bull, & Buka, 2004) and access (Babey et al., 2008; Pate et al., 2008; Scott, Evenson, Cohen, & Cox, 2007) and (c) personal factors, like motor skills (Barnett, Morgan, & van Beurden, 2008), perceived barriers, (Robbins, Pender, & Kazanis, 2003), intention (Hamilton & White, 2008), and self-efficacy (Davis-Kean et al., 2008; Motl et al., 2005).

Determinants and intervention research. Theoretical and empirical work related to determinant variables has produced significant knowledge about physical activity in adolescence. However, the value of those determinants to health promotion research has been limited by their failure to direct interventions that produce consistent outcomes (Lewis, Marcus, Pate, & Dunn, 2002; Salmon, Booth, Phongasavan, Murphy, & Timperio, 2007) and affect long-term behavior change (Nigg et al., 2008).

Inconsistent findings persist and no reliable intervention for promoting physical activity has emerged. Some 25 controlled trials of adolescent interventions have been the subject of multiple systematic reviews (Marcus et al., 2006; Pate & O'Neill, 2009; Salmon et al., 2007). Dissimilarity between studies has made comparison difficult and

generally limited their synthesis to systematic review without meta-analysis. Intervention studies have been conducted in school, home, primary care, and community settings, have used a wide range of behavioral, cognitive, and social strategies, and have operationalized physical activity with both objective and subjective measures (Marcus et al., 2006). Given significant variation among studies, reviews are narrow and tend to focus on the effects of only one or two components of the interventions. Often the subject of review are intervention settings and strategies (van Sluijs et al., 2008).

Van Sluijs, McMinn, and Griffin (2008) conducted a systematic review in which the impact of various settings and intervention strategies were evaluated. Of the 24 included studies, 14 interventions took place in schools, six were based in schools but included some kind of family or community involvement, one was family based, one was community based, and two occurred in a primary care setting. The authors concluded that only the school-based interventions that included family or community involvement, demonstrated strong evidence for their effect on physical activity. With regard to intervention strategies, six of the 24 studies used multi-component interventions, or some combination of education, policy changes, and environmental changes (van Sluijs et al., 2008). Those multi-component interventions were found to be more effective at increasing physical activity than either education or environmental changes alone. This finding is consistent with that of other reviews, where modest increases in physical activity have been associated with multi-component intervention strategies that targeted individuals and their social contexts (Salmon et al., 2007). It is notable that only half of the reviewed interventions resulted in statistically significant increases in physical activity and the clinical significance for some of those increases was not convincing

(behavior increases ranged from 2.6 minutes in physical education class to 283 minutes per week of overall physical activity) (van Sluijs et al., 2008). Clearly, physical activity is a complex health behavior in adolescence that current approaches have yet to capture and a new approach is warranted.

Baranowski and Jago (2005) suggested that poorly understood mechanisms of physical activity underscore intervention ambiguity and are a significant problem of current research. A meta-analysis examined how determinant variables were included in early physical activity interventions (Baronowski, Anderson, & Carmack, 1998). In this review, self-efficacy, outcome expectancies, social support, knowledge, benefits and barriers, and attitudes related to physical activity were identified as mediating variables. These variables, arising primarily from social cognitive theory (Bandura, 1986), the transtheoretical model (Prochaska & DiClemente, 1983), the theory of planned behavior (Ajzen, 1991), and the health belief model (Becker, 1977) accounted for less than 30% of the variance in physically active behavior. Based on these results, Baranowski et al. (1998) concluded that interventions guided by these frameworks did not adequately predict adolescent physical activity and further theoretical and empirical work was needed. However, these same theoretical frameworks continue to dominate physical activity intervention research. Subsequent reviews have reported similar concern about the modest and inconsistent relationship between determinant variables and intervention outcomes (Lewis et al., 2002). Failure to find effects has been attributed in part to methodological flaws however, well-designed trials have also produced inconsistent results (Lewis et al., 2002).

Inconsistent results have plagued physical activity intervention research, but failure to produce long-term behavior change is also of great concern (Nigg et al., 2008). If the goal is to prevent the typical developmental decline in physical activity, it is particularly important to have a clear understanding of the mechanisms associated with behavior maintenance. Only recently have researchers started to explore the relationship between determinants and adherence to a physically active lifestyle (Marcus et al., 2006). Early findings suggest that the same determinants may not be relevant when considering maintenance versus adoption of physically active behavior (Nigg et al., 2008). For example, self-efficacy, a concept from social cognitive theory (Bandura, 1986), has been a forerunner in the study of physical activity (Dzewaltowski, 1994). Changes in self-efficacy have demonstrated relatively consistent proximal effects on behavior (Marcus et al., 2006). It has not, however, been reliably associated with adherence to increased levels of physically active behavior. Hofstetter, Hovell, and Sallis (1990) concluded in a retrospective study of self-efficacy and physical activity that "exercise self-efficacy is dynamic and likely to change with changes in proximal experiences…self-efficacy may require continuous environmental and social support in order to maintain [it]" (p. 1175).

Because of these limitations, more recently multi-level interventions have been tried. Based in a social-ecological framework of health behavior (Elder et al., 2007), interventions that target policy, physical environments, social and personal environments. Change policy and physical environments so there is access to physically active behavior. Educate and motivate at the individual level. One area that has received less attention is the internal cognitive environment. External environments have a reciprocal relationship with the self. One cannot be understood without the other. Gaining popularity are

cognitive models of the self, because they hold promise as mechanisms for long-term behavior change. Self-schemas and related possible selves, as described in Markus' (1977) cognitive model of the self, are stable cognitive structures that affect information processing and regulate behavior. Individuals who possess self-schemas in domains related to sport, exercise, or other physically active behavior have been shown to process activity related information more efficiently (Berry, 2006; Kendzierski, 1990), be more active (Hays, Damush, & Clark, 2005; Kendzierski, 1988, 1990; Robbins, Pis, Pender, & Kazanis, 2004; Yin & Boyd, 2000), and plan to be more active in the future (Kendzierski, 1990) than those who do not. Given these schema-related effects, active behavior becomes a consequence of physically active self-schemas and a reasonable focus for health-promotion researchers and clinicians.

Schema Model of the Self-Concept

Against this backdrop, questions regarding what self-schemas are, how they affect physically active behavior, and whether they can be modified or purposefully constructed arise. These questions are answered in the schema model of the self-concept (Markus, 1977). From this perspective, the self is a multifaceted cognitive structure that contains multiple, relational, domain-specific schemas and possible selves (Markus, 1977; Markus & Nurius, 1986; Stein, 1995a, 1996). Self-schemas and possible selves are the building blocks of the self-concept that represent past, present, and future selves in valued domains (Hart, Fegley, & Brengelman, 1993; Markus & Kunda, 1986). Schemas and possible selves serve to organize social experience and motivate future behavior (Froming, Nasby, & McManus, 1998; Henderson, Hagger, & Orbell, 2007; Oyserman, Bybee, & Terry, 2006). The self-concept, therefore, is a set of beliefs one has about the

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self with both structural and functional properties (Stein, 1995a). A review of the general structure and functions of self-schemas and possible selves, and their organization within the self-concept, delineates the product of a developmental process.

Self-Schemas

Self-schemas are elaborate cognitive representations of past and present selves. They are enduring, yet malleable, memory structures that function to synthesize knowledge and feelings about the self in an important behavioral domain (Markus, 1977). Thoughts, feelings, and experiences continuously generate memories that are stored as both declarative and procedural knowledge in self-schemas (Klein & Loftus, 1993).

Self-schema content. Declarative knowledge is factual knowledge about the self (Kihlstrom, Beer, & Klein, 2005). It is contained in two types of memory, episodic memory of specific events and semantic memory of abstract traits. For example, each time an adolescent goes on a walk, plays basketball in physical education class, or swims with friends, she encodes information about the self in the physical activity domain. One can call on knowledge gained from episodes of individual experience and imagine oneself in future domain-related activity (Schacter & Addis, 2007). The ability to form expectations for the self is important to the process of self-schema formation and is facilitated by episodic memory.

With further elaboration, these individual episodes may be abstracted into a second type of declarative knowledge, called semantic self-knowledge, which may render a general claim, "I am an active person", or a more specific affirmation, "I am a swimmer". What the domain and affirmation means to the individual is stored in the collective memory of past experience. Therefore, the declaration that "I am a swimmer"

is not simply referencing the act of getting into a pool and swimming. Rather, the swimmer-schema might include knowledge of how to swim, perceived physical attributes of a swimmer, awareness of one's competitors, a planned training regimen with specific goals, enjoyment of the activity, feelings of success when meeting a goal- time and more. These semantic abstractions, stored as declarative knowledge, are the basis of domain-specific self-definition, and contribute to schematic information processing.

In addition to declarative knowledge, schemas also contain procedural knowledge that facilitates current and future behavior (D. F. Anderson, Cychosz, & Franke, 1998; Cantor, 1990; Kendzierski, 1988; Markus, 1977; Sheeran & Orbell, 2000). Procedural knowledge is the unconscious, practical knowledge for how to behave in a domain. It includes motor skills, habits, rules of normative behavior, and strategies (Cantor, 1990; Higgins, 1987; Stein, Roeser, & Markus, 1998). Procedural knowledge allows one to plan for and regulate behavior in a given domain.

Contemporary neuroscience agrees that there are multiple systems of self-knowledge, including separate neural structures that support memory of specific events (event-based self-knowledge) and memory of abstract traits (intuition-based knowledge) (Lieberman, Jarcho, & Satpute, 2004). Neuroimaging studies have provided some clarification of the relationship between behavioral experience, schema formation, and information processing. Lieberman et al. (2004) conducted a functional neuroimaging [fMRI] study with 11 elite soccer players and 11 actors, all with high levels of experience in their respective domains. During fMRI scanning, a series of trait words (athlete, actor, or neutral words) were presented to participants via fiber-optic goggles. Participants

were asked to indicate whether the trait word described them or not by pushing an analogous button.

Analysis of response latencies revealed that participants with high levels of domain-related experience responded significantly more quickly to corresponding trait words (athletes responded more quickly to athletic words versus acting words; actors responded more quickly to acting words versus athletic words. High levels of experience in a domain resulted in more efficient information processing. However, all participants had high levels of experience in either soccer or acting, but not all were schematic for their respective domain. Brain activation patterns revealed that schematic participants used processing structures associated with intuition-based self-knowledge, while non-schematic participants relied on structures associated with evidence-based self-knowledge.

These brain images provided neural evidence that storage of knowledge differs between schematic and non-schematic individuals and that this difference is not merely a consequence of experience. Differential patterns of brain-region activation between schematic and non-schematic individuals also provide evidence for the enduring nature of self-schemas. Knowledge of which brain-regions were activated during schematic information processing (the ventromedial prefrontal cortex, nucleus accumbens, and amygdala) led Lieberman (2007) to conclude that intuition-based self-knowledge associated with self-schemas is slow to form, slow to change, and relatively insensitive to thoughts and social feedback about behavior. This conclusion supports a defining property of self-schemas; that they are stable cognitive structures that promote self-consistency across time and context.

Self-schema function. Lieberman et al.'s (2004) findings provided neurological confirmation of schema effects related to information processing previously observed in social-cognitive research. Markus (1977) conducted two landmark studies that demonstrated the way schemas affect information processing by way of directing attention to self-relevant stimuli and resisting discrepant feedback. In the first study, forty-eight female college students, with independent schemas, dependent schemas, or no related schema were asked to answer whether each of 69 trait adjectives was self-descriptive or not, to provide behavioral evidence for a subset of those traits, and then indicate how probable it was that they would engage in certain domain-related behaviors. Response latencies were measured. Consistent with hypotheses, schematic participants selected self-descriptive traits more quickly, provided more examples of schema-consistent behavior, and predicted future behavior in the domain with more certainty than aschematic participants.

Kendzierski (1990) replicated these findings for the exercise domain in 66 undergraduate students. Through a series of tasks completed in individual sessions, Kendzierski found that participants who were schematic for exercise endorsed more exercise words as self-descriptive, took less time to make judgments about the self and exercise, recalled more episodes of exercise behavior, and planned to engage in more future exercise than nonexerciser schematics. Berry (2006) demonstrated similar efficiency effects for exercise words in 36 undergraduate students with and without exerciser self-schemas. In a modified Stroop color-naming task, 12 exercise words and 12 control words were presented on a computer screen in one of four colors: blue, green, red, and yellow. Participants were instructed to identify the color of the word.

Investigators hypothesized that exerciser schematis would demonstrate atentional bias to the exercise words. Analyses of data supported this hypothesis as exercise schematics responded by naming the color significantly more slowly when paired with the exercise related words than to control words. Green and Sedikedes (2001) have suggested that attentional bias is more than a lens by which individuals view their social world. Rather, it is a schematic function that works to maintain cognitive status quo. From these findings, it is reasonable to conclude that physically active self-schemas affect cognitive processing of activity relevant information in a person's environment.

In addition to more quickly attending to domain-relevant stimuli, self-schemas also function to resist discrepant feedback. Participants in Markus' (1977) second study were identified as having either a "dependent" or "independent" self-schema, then given information that was inconsistent with that schema (Markus, 1977). Analyses of data revealed that schematic participants who received discrepant feedback demonstrated significantly longer response latencies than aschematics. These results suggested that self-schemas are resistant to discrepant feedback. Dauenheimer et al. (1999) obtained similar findings when they compared the reaction of people with more or less elaborate self-conceptions to positive, negative, or self-consistent feedback. Subjects with very elaborate self-conceptions (operationally defined as those with extreme ratings to questions of certainty and importance of a self-conception) were more likely to accept consistent feedback and reject inconsistent feedback, regardless of its valence. These findings reveal a self-consistency effect that maintains preference for schema-consistent information, even when more flattering feedback is available.

By resisting discrepant feedback, schemas bias information processing to maintain order and stability of the self-concept (Markus, 1977). Kendzierski et al. (2002) demonstrated similar information processing effects in a sample of 453 exerciser schematic and nonschematic undergraduate students who were asked to assign reasons for failure to exercise in a fictitious scenario. Participants read one scenario and imagined it having happened to them, and then read a second scenario and imagined it having happened to someone else. Participants listed reasons for the imagined exercise lapse and rated those reasons on a measure of stability. While exercise schematics identified similar reasons as nonschematics for failure to exercise in the scenario, they attributed less stability to those reasons. Exercise schematics also considered reasons for their own exercise lapse with less stable attributions than for an unknown other. Kendzierski et al. concluded that exerciser schematics viewed the same obstacles to behavior differently than nonschematics, and in doing so biased the way the information was interpreted.

Together, these studies provide support for the relative stability of self-schemas through cognitive processing mechanisms. Once formed, schemas foster their own growth and development by attending to schema relevant stimuli and resisting inconsistent feedback, a conclusion validated by Lieberman et al. (2004) from a neuroscience perspective.

In addition to effects related to information processing, self-schemas exert powerful influence over behavior. Multiple studies have confirmed a relationship between self-schemas and behavior in the domain of physical activity (C. B. Anderson, Masse, Zhang, Coleman, & Chang, 2009; Boyd & Yin, 1996; Estabrooks & Courneya, 1997; Hays et al., 2005; Kendzierski, 1988, 1990; Robbins et al., 2004; Strachan, Brawley, Spink, & Glazebrook, 2010; Yin & Boyd,

2000). In a seminal work, Kendzierski (1988) examined the effects of exerciser self-schemas on the exercise behavior of 220 undergraduate students. In this cross-sectional study, she found that participants who were schematic for exercise reported significantly more exercise behavior than either nonexerciser schematics or aschematics on survey measures. Kendzierski (1990) conducted a second prospective study revealed that participants who were schematic for exercise were more likely to have initiated an exercise program at 12 weeks than either nonexerciser schematics or aschematics. Yin and Boyd (2000) also found a relationship between exerciser self-schemas and behavior in their study of 161 healthy undergraduate students. Exerciser schematics in that study reported more frequent participation in aerobic exercise and had higher caloric expenditures than either aschematics or nonexerciser schematics (as measured on Kendzierski's (1988) Exercise Self-Schemata Questionnaire).

More recently, the relationship has been documented in developmentally diverse populations. Hays et al. (2005), for example, found a relationship between physically active self-schema and physically active behavior in 86 women aged 50 to 88 who were receiving care at a primary care center. Exercise self-definition among women of their study was significantly correlated with participation in free exercise classes. Findings such as these, demonstrate that the relationship between self-schemas and behavior are not reserved for healthy, young adults.

Likewise, similar results have also been found in adolescent populations (C. B. Anderson et al., 2009; Robbins et al., 2004). Robbins et al. (2004), for example, studied the physical activity self-definition of 9 to 17 year old adolescents. Current physical activity self-definition was significantly correlated with exercise frequency. More

recently, C. B. Anderson et al. (2009) examined the contribution of athletic identity to a seven-day measure of physical activity and sports team participation in 948 seventh and eighth graders. They found that 5% of the variance in physically active behavior and 15% of sports team participation was accounted for by the presence of an athletic identity, after removing effects of gender and race. Taken together these studies establish a clear relationship between physically active self-schemas and physically active behavior.

Plans and strategies contained in cognitive self-schemas provide a mechanism for the relationship between self-schemas and domain-specific behavior. Kendzierski (1988) considered these mechanisms of behavioral regulation with 220 university students who completed questionnaires that examined their exercise schemas and behavior. She found that subjects who were schematic for exercise reported a significantly greater number of plans for exercising in the future and a greater number of tricks or strategies to incite future exercise behavior. Sheeran and Orbell (2000) also showed in their study of 283 undergraduates that intention to exercise was significantly correlated with exercise self-schema and that schematics were significantly more likely to act on that intention than aschematics.

By directing attention to schema-consistent stimuli, rejecting inconsistent feedback, and facilitating domain-specific behavior, schemas perpetuate their own existence to become stable self-conceptions (Markus, 1977; Stein, 1995a). One can reason from a self-schema perspective that once an adolescent develops a physically active self-schema, functions related to information processing and behavioral regulation

help to sustain it. Effort to promote physically active behavior in adolescence is, in this

line of thinking, facilitated by the presence of a physically active self-schema.

The implications of schema stability are positive when considering intervention to

maintain physically active behavior. Stability could become a liability for a person who

possesses an "inactive", "un-athletic" or "couch potato" schema. If schemas were stable

to the point of being rigid, attempts to modify an inactive schema with intervention

would be pointless. Fortunately, schemas are also malleable in response to social and

behavioral experience. Possible selves allow for growth and modification in an otherwise

stable view of self (Markus & Nurius, 1986).

Possible Selves

Possible selves are a mechanism of change in the self-concept (Markus & Nurius,

1986). While self-schemas are cognitive structures about past and current selves,

possible selves are representations of the future self. They promote growth and change in

self-definition by opening the self to new possibilities and connecting past and present

selves with the future (Markus & Nurius, 1986). Possible selves are cognitive

representations of who one hopes to be, expects to be, or fears becoming in the future

(Markus & Nurius, 1986). Each of these basic types of possible selves serves a unique

function. Hoped-for possible selves are dreams and fantasies about the future self

(Markus & Nurius, 1986). Hoped-for possible selves promote optimism, but they may

lack opportunities or strategies for becoming reality (Oyserman, Bybee, Terry, & Hart-

Johnson, 2004). More important to the regulation of future behavior are expected selves.

Expected selves describe who one expects to become in the future. They are powerful

regulators of behavior, since they are more likely to contain domain specific goals and

strategies to attain them (Oyserman et al., 2004). Feared selves are representations of the self one wants to avoid becoming (Markus & Nurius, 1986), and in balance with hoped and expected selves further motivate domain related behavior (Oyserman & Markus, 1990a).

Function of possible selves. Possible selves, particularly a balance of hoped and feared possible selves, motivate and regulate behavior in important domains (Black, Stein, & Loveland-Cherry, 2001; Markus & Nurius, 1986; Oyserman & Markus, 1990a; Stein et al., 1998). Oyserman et al. (2002) demonstrated the self-regulatory effects of possible selves following a nine-week after-school program designed to build the academic possible selves of urban middle-school students. Following the intervention, subjects reported more balanced (expected and feared selves in a single domain) possible selves, more strategies to achieve those possible selves, and more goal consistent behavior. Such findings illustrate that possible selves motivate the planning, organization, and execution of goal directed behavior (Markus & Kunda, 1986).

Possible selves are not limited to domains of current self-definition, but link to an existing schema provides a rich base of knowledge on which to form expectations for a future self. Possible selves that arise from existing schemas already possess a general understanding of the domain that permits formation of more elaborate representations (Oyserman & Markus, 1990b). Possible selves arising in domains where one has significant experience will include more strategies, skills, and repertoires for behaving in the domain from which to develop and achieve future goals (Stein, 1995a). Oyserman, Bybee, Terry, and Hart-Johnson (2004) found that explicit goals and strategies are the mechanisms by which possible selves affect behavior. In their study of 168 eighth-

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graders Oyserman et al. (2004) found that possible selves with specific goals and strategies predicted better academic outcomes. The mere presence of possible selves and the balance of expected and feared selves did not.

Well-developed strategies for achieving tangible goals are a key component of possible selves (Markus & Nurius, 1986; Oyserman, Gant, & Ager, 1995; Oyserman et al., 2002; Stein, 1995a; Yowell, 2000). It is through effective strategies that possible selves regulate behavior. Oyserman et al. (2006) suggested that the following properties determine when possible selves will exert regulatory action: (a) when the possible self contains behavioral strategies, (b) when the social context supports working on the possible self, (c) when the possible self feels congruent with other social identities, and (d) when difficulty working on the possible self is considered normal. Using these properties, Oyserman et al. (2006) designed a ten-session intervention program to develop academic possible selves and strategies in 264 low-income, minority middle school students. Students were randomly assigned to either the intervention or control groups. Data were obtained related to participant's academic possible selves, social identity, self-regulatory behavior, academic outcomes, and depression in both the 8th and 9th grades. Results confirmed that the intervention was successful in changing the balance between expected and feared academic possible selves and increasing recognition of strategies to obtain them. Intervention participants also demonstrated significantly more self-regulatory behavior (more time doing homework, greater initiative in class, less disruptive, and less skipping class) than the control group. In this study, Oyserman et al. (2006) demonstrated that possible selves and effective strategies can be purposefully produced through intervention and that those possible selves effectively support behavior

regulation. Possible selves have been infrequently studied with respect to physical activity (Harju & Reed, 2003; Murru & Martin Ginis, 2010; Whaley & Shrider, 2005), however these findings have important implications for the development of possible selves in other behavioral domains for they suggest a means of modifying or building health related schemas with strategies for behavior regulation.

Self-schema theory, therefore, provides a useful framework for understanding the relationship between cognitions about the self and domain-specific behavior. Specifically, it serves to clarify how self-schemas function to regulate information processing and behavior. There is evidence that physically active self-schemas regulate active behavior and that possible selves serve as a bridge to stable self-conceptions and related behavior. It is too simplistic, however, to suggest that once formed physically active self-schemas are ever present and persist in their influence over behavior. Changes observed in adolescent physically active behavior provide evidence that this is not the case. However little research has focused on how self-schemas change over time, particularly with respect to developmental processes of adolescence.

Theories of adolescent identity formation, however, can provide insight into this stage of development. Much is known about these developmental processes, but the bodies of literature have remained largely separate. Understanding the relationship between physically active behavior and self-representation requires understanding of this changing context of adolescence. Together these theoretical perspectives provide a comprehensive framework for understanding the relationship between self-representation and behavior during the unique period of adolescence.

Identity Formation

Identity theory is grounded in the psychoanalytic tradition of Freud and became familiar in developmental psychology through the early work of Erik Erikson (Erikson,

1950, 1968, 1970). His articulation of the identity concept has provided a basis for related theoretical and empirical work for the past 60 years and continues to provide that foundation today. Erikson described identity in his classic book, *Identity: Youth and Crisis*, as follows:

> The wholeness to be achieved at this stage I have called a *sense of inner identity*. The young person, in order to experience wholeness, must feel a progressive continuity between that which he has come to be during the long years of childhood and that which he promises to become in the anticipated future; between that which he conceives himself to be and that which he perceives others to see in him and to expect of him (Erikson, 1968, p. 87).

According to Erikson (1968), the process of identity development (a) is gradual and continuous, (b) is a series of dynamic interactions between the adolescent and social context, and (c) results in commitment to multiple, temporal selves that are integrated into a unified whole. These themes function as an overarching framework for examining the process of adolescent identity formation and provide a context for understanding physical activity and adolescent self-representation.

Identity Development as Gradual and Continuous

Erikson (1950) described identity as a lifelong process. While recognized as a primary task of adolescence, identity formation does not begin or end in that developmental period (Erikson, 1968; Kroger, 2007). It is a gradual process that begins in infancy and early childhood (Harter, 2003). Childhood identities are qualitatively different from more mature forms. Since young children have limited cognitive capacity to evaluate their behavior through social comparison or internalized standards, childhood views of self are generally positive and are supported by encouragement from important

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others (Harter, 2003). Early identities depend on social scaffolding for evaluation and maintenance (Harter, 2003; Manian, Papadakis, Strauman, & Essex, 2006).

While the foundation for self-understanding is based in early experience, the process of identity formation becomes particularly salient during adolescence (Fredricks et al., 2002). With advancing cognitive development, adolescents become actively concerned with opinions of others, particularly sensitive to social comparison, and attentive to their various social roles (Harter, 2003). This prompts reconsideration of early identities with either their subsequent abandonment or reorganization in developing cognition. Erikson (1980) states that re-evaluation of early childhood identifications occurs when "a variety of social roles become available and increasingly coercive" (p. 96). Indeed a change and increase in domain opportunity arises within the social context of adolescence (Eccles et al., 1989; Fredricks et al., 2002; Jacobs, Lanza, Osgood, Eccles, & Wigfield, 2002; Kroger & Green, 1996; Markstrom-Adams, 1992; van Hoof & Raaijmakers, 2002).

Altschul, Oyserman, and Bybee (2006) questioned the tacit instability of identities and suggested that some remain stable and functional despite transitions of adolescence. To examine the effect of developmental transition on racial-ethnic identities, they conducted a two-year longitudinal study of 139 eighth-grade students. Data revealed relative stability in racial-ethnic identity across the adolescents' transition from middle to high school. Altschul et al. (2006) also found that the functional relationship between racial-ethnic identity and academic outcomes did not change over time. These findings suggest that there are unique properties of some identities that lend stability throughout the period of adolescence.

The question of whether adolescent identity is characterized by stability or change is not a new question, but one that has received recent attention in adolescent identity literature (Klimstra, Hale, Raaijmakers, Branje, & Meeus, 2010; Klimstra, Luyckx et al., 2010; Kroger, Martinussen, & Marcia, 2010; Meeus, van de Schoot, Keijsers, Schwartz, & Branje, 2010). While there is general agreement that identity matures throughout adolescence, the amount of stability and change that occurs has been disputed (van Hoof, 1999; Waterman, 1999). Klimstra, Hale et al. (2010) measured the underlying dimensions of identity development (two types of exploration and commitment) in 923 early to middle adolescents and 390 middle to late adolescents in a five-year, longitudinal study. Identity processes in education and friendship domains were measured by survey, administered once per year for five years. Consistent with previous studies, there was a general progression in these domains toward mature identities. However, their commitment to the domains was remarkably stable. The authors concluded that while there was developmental change in the way adolescents dealt with their commitments (a decrease in reconsideration and increase in in-depth exploration across middle to late adolescence), the actual commitments remained stable. Over the course of adolescence, then, the process of adolescent identity formation is both stable and changing.

Short term fluctuations in adolescent identity have also been identified. Day-to-day variability in exploration and commitment was measured for 590 adolescents, also in the domains of education and friendship, in a study by Klimstra, Luyckx et al. (2010). At baseline, 3 months, and 6 months, participants completed a single item measure of identity status for each of the domains, daily for five days. Path analysis of the daily measures indicated that paths from reconsideration (a dimension of exploration) to

commitment were negatively correlated from one day to the next; meaning, that higher scores on reconsideration of a domain one day led to lower commitment scores the next day. These relationships were stronger in the friendship domain but also significant for education. These results demonstrated day-to-day identity fluctuation, presumably driven by adolescents' reconsideration of current commitments. Together, these findings provide evidence for a process of identity formation that is characterized by both stability and change throughout the period of adolescence.

This point is significant as one considers the relationship between physical activity and adolescent self-representation. Adolescents emerge from childhood with a past and present identity, and that self-history provides a landscape for continued identity development. Commitment to some identities persists and those stable identities provide continuity for the self and serve as a foundation for identity exploration in other domains. Newer or less stable aspects of self, must prove fit with these previously established commitments. How any domain negotiates its way into identity depends, in large part, on the constellation of already established identities.

Interaction with the Social Context

Erikson (1968) described the process of identity formation as a series of interactions between individuals and their environments. Marcia (1966) expanded Erikson's (1968) general description of the adolescent-environment interaction of identity formation by operationalizing concepts of exploration and commitment. In his influential identity status paradigm, exploration was defined as a process of engaging and trying-out multiple identity alternatives before committing to the values, beliefs, and behaviors of the domain. Commitment was defined as the degree of personal investment in an identity

(Marcia, 1966). Marcia (1966) used the concepts of exploration and commitment to define four identity statuses: (a) diffusion, where there is no identity commitment or exploration of alternatives, (b) foreclosure, where there is commitment to an identity without exploration, (c) moratorium, where there is exploration without commitment, and (d) achievement, where identity commitment occurs following exploration of alternatives. The statuses were initially conceptualized as points along a developmental continuum with diffusion leading to foreclosure, which led to moratorium, and finally to identity achievement (Marcia, 1966). However, empirical work has generally failed to support a specific sequence of the statuses, and multiple developmental trajectories have been identified (Berzonsky & Adams, 1999; Bosma & Kunnen, 2001; Meeus, Iedema, Helsen, & Vollebergh, 1999; Seaton, Scottham, & Sellers, 2006).

Marcia's (1966) global definitions of exploration and commitment were used for nearly 40 years to characterize the basic processes of adolescent identity development. However, Meeus, Iedema, and Maassen (2002) noted that exploration did not end with commitment to an identity. Rather, they suggested that there are two distinct types of exploration, one that occurs before commitment and one that occurs afterward. Consistent with this more contemporary conceptualization of identity processes, Luyckx et al. also tested and validated a model that considered two distinct dimensions of both exploration and commitment. The significance of this distinction is that exploration does not end with commitment to a domain, but continues throughout development and context.

Exploration and commitment provide the mechanisms that are alluded to, but not fully accounted for, in Erikson's (1968) global approach to identity development

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(Grotevant, 1987; Luyckx, Goossens, Soenens, & Beyers, 2006; Meeus et al., 2002). The concepts have been included in process models that seek to describe how identities are formed in individual domains (Grotevant, 1987; Kerpelman, Pittman, & Lamke, 1997). Grotevant (1987), for example, proposed that identity development is an active process of exploring alternatives and committing to choices. In his model, exploration and commitment are related in an iterative process that is supported or constrained by one's social context and current identity. In the process, domain-related behavior generates feedback, feedback results in positive or negative affective outcomes, outcomes contribute to identity consolidation, and evaluation of that identity prompts additional domain-related behavior (Grotevant, 1987).

The exploration process and subsequent commitment to identity are therefore influenced by individual and contextual factors of adolescence. Individual factors such as cognitive development (Harter, 2003; Higgins, 1989), personality or identity style (Berman, Schwartz, Kurtines, & Berman, 2001), and other concomitant identities (Berger & Heath, 2008; Oyserman, Fryberg, & Yoder, 2007) affect the process by which one explores and commits to identities. Parents and peers are primary members of adolescent social circles and share an important role in (a) facilitating exploration (Beyers, 2008), (b) reflecting and providing feedback for self-evaluation (Hall & Brassard, 2008; Schachter & Ventura, 2008), and (c) establishing a set of normative values and beliefs (Hall & Brassard, 2008; Knafo & Schwartz, 2004; Oyserman, 2007; Schachter & Ventura, 2008). Therefore, exploration is not simply "trying out" or behaving in a variety of domains. Rather it is an active process that combines information seeking and behavioral experience with related feedback (Grotevant, 1987). Through processes of

exploration, identity is shaped by past experience and opportunities afforded in the environment.

Identity-related experience. It is generally understood that identity cannot be established in domains for which one has no experience. However, the amount and kind of experience necessary for identity formation is not entirely clear. Exploratory behavior leading to eventual identity formation has been infrequently studied, but preliminary results suggest disparate effects of different activities (McIntosh, Metz, & Youniss, 2005; Metz, McLellan, & Youniss, 2003). For example, Metz et al. (2003) found in their study of civic identity formation, that adolescents who performed services that helped people or social causes demonstrated greater social concern and intention to engage in future social service than those who performed other volunteer services. From these findings, it is reasonable to conclude that all domain-related experience does not equally contribute to identity formation. It is likely that various types of exploratory activities, including but not limited to mental rehearsal, knowledge seeking, active participation, and social expression, each make a unique contribution to adolescent identity and a wide range of activities are needed in the process.

A number of organized activities have been associated with positive adolescent identity development (Busseri & Rose-Krasnor, 2009; Larson, Hansen, & Moneta, 2006; Palen & Coatsworth, 2007). The influence of participation in six general activity domains (sports, performance and fine arts, academic clubs and organizations, community-oriented activities, service activities, and faith-based groups) on identity work, for example, was examined in a study conducted by Larson et al. (2006). A sample of 2, 280 adolescents completed an inventory of activity participation and the

YES 2.0 survey that measured personal development, interpersonal development, and negative life experiences. All activities were associated with at least one positive aspect of youth development (identity work, initiative, emotional regulation, teamwork and social skills, positive relationships, and adult networks). Busseri and Rose-Krasnor (2009) also conducted a series of studies where breadth and intensity of adolescent activities were positively related to psychological well-being, academic orientation, and a composite measure of successful development. Adolescent activities, based on these findings, provide youth a context for positive development and identity exploration. Identity development is constrained, when opportunities are either not available or engaged.

Evaluation. Evaluation is a mechanism that mediates the relationship between exploratory behavior and identity growth and change. Both affective and cognitive appraisals are generated in past experience (Grotevant, 1987; Sharp, Coatsworth, Darling, Cumsille, & Ranieri, 2007) and that information is used in making subsequent value judgments (Bickart & Schwarz, 2001). Comparing the self to internal identity standards allows the adolescent to evaluate the self in an identity domain (Kerpelman et al., 1997). Identity standards are an internal set of beliefs, values, and rules for normative behavior that originate in the social group.

Bosma and Kunnen (2001) described the function of continued exploration, evaluation, and feedback in shaping identity. Specifically, they proposed that feedback consistent with one's identity results in its confirmation. Feedback inconsistent with one's identity prompts either a change in interpretation of the event (assimilation), or adjustment of the identity (accommodation). Bosma and Kunnen further noted that

changes to identity do not occur with each conflicting situation; rather it is the result of multiple, continuing events that weaken or strengthen identity commitment over time. Evaluation during the process of exploration results in the constant building, modeling, and changing of identity.

Commitment and Integration to a Unified Whole

  Commitment. Commitment, through the allocation of time, effort, and limited resources, influences the value of a domain (Higgins, 2006). The degree of commitment, to particular identities, therefore, has important implications for future behavior and decision-making as the adolescent negotiates a variety of identities and social contexts. Commitment varies by domain and changes over time (Bosma & Kunnen, 2001; Luyckx, Goossens, & Soenens, 2006). Domains that are more central and salient are enacted with a greater degree of commitment (Reich, 2000). It is important to note that exploration does not sequentially precede commitment, rather it is a co-occurring process (Meeus et al., 2002). "Identity development, in general, can be seen as the complex of changes in strength and quality of commitments" (Bosma & Kunnen, 2001, p. 44).

  Integration. Integration is considered the final stage of identity development where commitments to multiple domains are reconciled with each other. Erikson (1968) described identity as a global construct, one in which multiple parts converge to create a unified whole. The process of integration is not well understood, but leads to continuity across time and contexts, permitting a coherent sense of self (Erikson, 1968).

<center>**Conclusion**</center>

  Physically active self-schemas are cognitive representations about the physically active self that exert powerful influence over domain-related information processing and

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behavior. It has been considered that effective interventions might be developed to increase physically active behavior in adolescents by way of building self-schemas. Self-schema theory provides information about the structure and function of domain-specific cognitive representations, but does not address the unique context of adolescence. Theories of adolescent identity development describe processes of exploration and commitment that have important implications for the relationship between physical activity and self-representation.

Two important points should be taken from this discussion of adolescent identity development. First, identity development in adolescence is a dynamic process of exploring and committing to domains that reconcile past, present, and future selves (Erikson, 1968; Grotevant, 1987). Previous commitments constrain the process of identity exploration, by limiting the breadth of available opportunities to those that fit with the current identity. Second, identities are based in past experience so to the extent that opportunities are constrained, so too are available identities. It is with these principles in mind that self-representations related to physically active behavior in adolescence are best understood.

Thus, theories of adolescent identity describe the development of self-definition in multiple domains and provide some insight for how they are reconciled in a global identity. This perspective contributes to a more complete understanding of the developmental context that underlies self-representation in adolescence. Questions remain, however, with regard to how particular identities or schemas are included in self-representation. The content and structure that support inclusion and maintenance of

physically active behavior cannot be inferred from this theoretical discussion. This study

addresses this identified gap in the literature.

Chapter III

Methods

To examine the nature of self-representations related to physically active behavior in adolescence, a secondary analysis of adolescent self-descriptive words and phrases was conducted in a qualitative research design. Research conducted from a qualitative perspective assumes a process of inductive logic, where knowledge is grounded in communication of participant experience (Sandelowski, 1995, 2000). A qualitative approach was particularly suited to this case, where the target of inquiry had been previously defined but a fresh perspective was desired. Without obligation to existing definitions of physically active self-schemas, patterns identified in the naturally occurring words of adolescents were allowed to emerge as a basis for new understanding.

Qualitative description is a kind of qualitative methodology that illustrates this type of inductive logic. As Sandelowski (2000) described it, qualitative description is an appropriate naturalistic method when the goal of inquiry is to summarize and interpret the facts of a phenomenon. It is characterized by a basic or surface reading of text, with simultaneous categorization and interpretation of the data (Sandelowski, 2010). Qualitative description entails the researcher to accurately describe the facts defining a phenomenon, a requirement that was consistent with the primary objective of this study.

Methods

Qualitative research is characterized by a systematic, yet fluid, investigative approach (Patton, 1999; Sandelowski, Davis, & Harris, 1989). Inquiry, therefore, was

not constrained by research methods established at the study outset. As knowledge was gained in the process of inductive analysis, procedures were refined and redirected to make use of new-found understanding. Although inherent limitations of secondary analysis precluded modification of sampling and data collection, flexibility in the process allowed data to drive analytic methods. Proposed methods provided a starting point for the eventual reflexive relationship between data and methods of analysis and interpretation.

Participants

One hundred and fifty-eight adolescents from an urban-Midwest middle school participated in the study in the eighth grade and one hundred and forty (88.6%) participants repeated measures in the ninth grade. The adolescents were predominantly white and the sample included equal numbers of boys and girls. Demographic characteristics of the study participants are presented in Table 3.1.

Human Participant Protection

All data for this study were previously de-identified and no identifying information remained. Anonymity of study participants, therefore, was ensured. The study protocol was reviewed by the University of Michigan Institutional Review Board and given an except status.

Measures

Data were initially collected in a 1992 to 1993 longitudinal study that examined the role of cognitions about the self in regulating the performance of health-promoting and risk-taking behaviors in adolescents. A subset of data obtained in the original study,

including an open-ended measure of adolescent self-representation and a self-reported measure of physically active behavior, were the focus of this study.

All About Me. Adolescent self-representations were measured in the original study by the *All About Me* task, an open-ended questionnaire designed to elicit beliefs about the self. Participants were asked to describe themselves by writing, on serially labeled index cards, self-descriptive words or phrases. Participants were instructed to write only one idea on each card (things they liked about themselves, things they didn't like about themselves, things they usually kept private).

Trained research assistants, guided by an investigator developed script, administered the *All About Me* task and other measures in the course of an individual face-to-face interview with each participant (see Appendix A for a verbatim script of instructions used to administer the task). Interviews were conducted during the school day in a designated room at the school. The task was completed by participants in the winter semesters of both the eighth and ninth grade.

To minimize bias and priming effects on the adolescents' self-descriptions, the *All About Me* task was administered before other closed-ended measures in the study and conversation with participants was limited. Participants were ensured that there were no right or wrong answers. Interviewers were instructed not to provide specific examples in response to participant's questions about the task and to remain neutral in response to the adolescent's generated self-descriptors.

After writing their self-descriptors on the cards, adolescents were asked to rate each of them on a one to ten scale with regard to (a) the self-descriptiveness of the idea expressed on the card (1 = not me, 10 = me) and (b) the importance of the idea expressed

on the card (1 = doesn't matter at all, 10 = matters very much. Consistent with Markus'

(1977) methodology, adolescents who rated an individual self-descriptor as an eight or

more for both the measures of self-descriptiveness and importance were considered

schematic for that characteristic. To determine the perceived valence of each self-

descriptor, participants were also asked to indicate whether they considered each one a

positive, negative, or neutral characteristic.

Child/Adolescent Activity Log. The *Child/Adolescent Activity Log (CAAL)*

(Garcia, George, Coviak, Antonakos, & Pender, 1997), a diary-type questionnaire, was

used to measure physical activity in the original study. The eighth grade questionnaire

included a list of 17 physical activities common in adolescence. An "other" category was

included to capture activities not listed on the measure. The ninth grade questionnaire,

after being modified to better represent activities selected by eighth grade participants,

included 21 physical activities. The 16 activities common to both the eighth and ninth

grade measures, included: walking, jogging/running, ice/roller skating, swimming for

fun, swimming laps, bicycling, aerobic/other dance, volleyball, football, softball/baseball,

soccer, tennis/racquetball, basketball, ice hockey, recess games, and snow activities and

were used for analysis in this study.

To complete the *CAAL*, each day for seven days participants indicated which of

the listed activities they had performed the day before and documented the duration of

that activity. Daily exercise logs were initiated at school on a Tuesday morning to record

activity completed on Monday. The logs were completed again on Wednesday,

Thursday, and Friday mornings. Two final logs were completed on Monday to document

activity completed on Saturday and Sunday.

Participants completed the seven-day log at five different time points (in the winter and spring semesters of the eighth grade and fall, winter, and spring semesters of the ninth grade). Participants were instructed by a research assistant on how to complete the measure. Classroom teachers were provided additional instruction and answers to common questions about the measure, so they could support daily log completion. Completed logs were deposited daily into a locked box in the classroom and retrieved by a research assistant.

Current physical activity recommendations suggest that adolescents engage in at least 60 minutes of moderate to vigorous activity per day (U. S. Department of Health and Human Services, 2008). Therefore, a measure of activity intensity is needed to determine if activities meet that requisite. A self-rated measure of activity-related effort was collected only in the eighth grade. Therefore, Metabolic Equivalent of Task (MET) values, assuming moderate effort, from the Compendium of Energy Expenditures were used in this study to estimate activity intensity (Ridley, Ainsworth, & Olds, 2008) (see Table 3.2 for estimated MET values). Activities with a MET value of less than 3.0 were considered of low intensity. Activities with MET values between 3.0 and 5.9 were considered of moderate intensity. Vigorous activities were those with MET values of 6.0 and higher (U. S. Department of Health and Human Services, 2008).

Since all activities listed on the *CAAL* were of at least moderate intensity, all reported activity was used to calculate an eighth and ninth grade average daily duration of activity score. Valid logs (those logs with at least four completed daily activity sheets) collected in the winter and spring semesters of the eighth grade were used to calculate an eighth grade average daily duration of activity score for each adolescent. Valid logs

collected in the fall, winter, and spring semesters of the ninth grade were used to calculate a ninth grade average daily duration of activity score for each adolescent. To calculate the eighth grade average daily duration of activity score, the sum of all minutes of activity reported in the eighth grade was divided by the total number of completed daily activity sheets in that year. The same calculation was repeated with ninth grade data to obtain a ninth grade average daily duration of activity score. Using a Kruskal-Wallis test to examine differences in median average daily duration scores, no significant differences were found in groups whose scores were calculated in the eighth grade with one versus two valid logs (H=1.78, df=1, p=.18) , or in the ninth grade with one, two or three valid logs (H=.63, df=1, p=.73).

Reliability. A test-retest reliability coefficient of 0.95 was achieved in previous testing of the *CAAL*, with repeated application of the measure at a one-week interval (Garcia et al., 1997). In this study the time between measures was longer and included seasonal variation. Test-retest reliability, therefore, was examined for two different intervals, including a three month interval between the eighth grade winter and spring measures (*r*=.64) and a one-year interval between the eighth and ninth grade winter measures (*r*=.59). These modest levels of reliability are acceptable, and not surprising in this case, given expected variation in physical activity between seasons (Carson & Spence, 2010) and anticipated change in adolescent activity across time (Kahn et al., 2008).

Validity. Content validity of the *CAAL* was established by examining its performance in relation to expected variation in adolescent physical activity behavior. It is generally accepted that adolescent boys are more active than girls (Centers for Disease

Control and Prevention, 2008) and there is a decrease in adolescent activity over time (Kahn et al., 2008). Valid measures of physical activity should detect these behavior patterns. Since data were not normally distributed, nonparametric statistical tests were conducted to examine these expected activity patterns. A Mann Whitney U test (one-tailed) showed that the median average daily duration of activity scores were significantly less for girls (39.7 minutes) than boys (77.3 minutes) in the eighth grade (U=1714, z=-3.93, p=.00) and were significantly less for girls (44.8 minutes) than boys (67.4 minutes) in the ninth grade (U=1729, z= 2.29, p=.01). Results of a Wilcoxon Signed Ranks test (one-sided) also showed significantly lower levels of activity in ninth grade adolescents (mean rank 56.9) than eighth grade adolescents (mean rank 76.4) (z= -1.83, p= .03). Together, these findings provide evidence for content validity of the measure.

The *CAAL* also demonstrated convergent and discriminant validity with other activity-related measures completed by the same adolescents (Table 3.3). In the original study, adolescents who completed the *CAAL* also answered a single question regarding their frequency of active behavior, a single question regarding athleticism on the *Me Now and in the Future* questionnaire, and completed the athletic subscale of Harter's *Self-Perceptions Profile for Adolescents.* Positive correlation between activity reported on the *CAAL* and these measures provided evidence of consistency across measures of the activity construct. Also as expected, there was a negative correlation between activity reported on the *CAAL* and being "out of shape" as reported on the *Me Now and in the Future* questionnaire.

Correlations, although modest in magnitude, were statistically significant and in the expected direction. The degree of correlation was not unexpected, since the measures targeted conceptually related but not identical constructs.

Data Preparation

Text data. In preparation for qualitative analysis of the text data, the adolescents' self-descriptive terms and statements generated in the *All About Me* task were entered to an electronic file. The set of each adolescent's self-descriptors was then printed on a separate page for each year. Each page included a case number and a number that identified whether the data were generated in the eighth or ninth grade. No other identifying, demographic, or physical activity related information was included on the page (Appendix B).

Each individual self-descriptive word or statement was then reproduced on a new index card. Reference information, including the related case identification number, grade, gender, race, valence, and schema classification (whether or not the person was schematic for the descriptor) was printed on the back of the card (Appendix C).

Activity data. Data from the *CAAL* were entered to an electronic data file.

Using PASW Statistics 18, the accuracy of physical activity data entry was confirmed by examining frequency analyses. Missing, impossible, or suspicious values were checked against the original data. Data were compared, and corrected when necessary, until no discrepancies remained.

Distribution of the physical activity data was then examined. The average daily duration of activity for the eighth and ninth grade both demonstrated a right-skewed, non-

normal distribution. A Shapiro-Wilk test of normality confirmed that data were not normally distributed (p=.00).

Outliers were evident in graphical display of the data. Review of these cases resulted in the identification of two adolescents who reported average daily durations of activity of more than 5.5 hours. Recognizing that an average of 5.5 hours per day meant that on some days reported activity was necessarily even higher than that (an unlikely achievement), these cases were reviewed with additional scrutiny. Upon investigation, it was discovered that one of these adolescents reported more than eight hours of activity on multiple days across time points. The second adolescent reported nearly eight hours of activity on multiple days and only completed data collection at one time point. It was determined that the duration and variety of activities reported by these adolescents were unlikely to have occurred and nearly impossible to have happened on days when school was in session. Therefore, data from these participants were deemed unreliable and removed from subsequent analyses.

Research Team

A research team was used to analyze and confirm findings of the adolescents' self-representation data that were collected in the *All About Me* task. A number of advantages have been identified in using this approach to qualitative data analysis, including "collective labor, thought, skill, and energy that team members bring" (Fernald & Duclos, 2005, p. 360). However, the varied perspectives challenged consistency in the analytic approach. Frequent and open communication with members of the research team was used to overcome this challenge (Fernald & Duclos, 2005). Research team members met at regular intervals to discuss both process and findings. Each meeting

began with a review of the intended purpose for the meeting and concluded with a review of what had occurred.

Team members. Donna Moyer, the principal investigator, is a doctoral candidate in nursing at the University of Michigan whose academic focus is the promotion of adolescent health through physically active behavior. With 18 years experience as a pediatric clinical nurse specialist, she has worked with children and adolescents across a variety of primary, secondary, and tertiary health contexts. Her primary research interests are related to the process of adolescent physically active self-schema formation. She conducted all analyses for this study. Institutional support and a strong dissertation committee, that includes leaders in self-schema research (Karen Stein, PhD and Daphna Oyserman, PhD), qualitative methodology (Kathleen Knafl, PhD, FAAN), and physical activity research (Kimberlee Gretebeck, PhD), supported this research.

Karen Stein, PhD is a professor of nursing at the University of Michigan. She has extensive experience in self-schema theory and related research. Dr. Stein participated in this research as chairperson of the dissertation committee and as a member of the research team. As a principal investigator in the original study (in which data for this study were obtained), she provided an important perspective and appreciation for the context in which data were collected.

Daniel Moyer and Erin Clark are ninth grade students who attend a Midwest high school. They contributed developmental breadth and an adolescent perspective to data analysis and interpretation of findings. The role of adolescents on research teams has been reported in the literature (Adam & Wiemann, 2003). Adolescents have been included on research teams, for example, to lead focus groups and deliver interventions

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(Ajuwon, Olley, Iwalola, & Akintola, 2001; Holder-Nevins, Eldemire-Shearer, & McCaw-Binns, 2009). Prior to being involved in this study, the adolescent research team members completed an online course in the protection of human research participants. Mr. Moyer and Miss Clark also attended a training session that reviewed the general scientific method and introduced the qualitative descriptive approach.

Analysis

Miles and Huberman (1994) describe three general activities that occur simultaneously throughout the process of qualitative analysis, including: data reduction, data display, and conclusion drawing. Activities of data reduction are aimed at targeting, selecting, and simplifying large volumes of raw data into meaningful units. Data display provides visual representation of the data in a form that allows for comparison and identification of patterns. Conclusion drawing is the act of selecting, extracting, and attributing meaning to the data. As summarized in Table 3.4, a series of within-case and across-case analytic strategies were used with these purposes in mind.

The overall process of analysis was characterized by back and forth movement between within-case and across-case methods, each complementing the other. Methods of within-case analysis facilitated the emergence of findings that were firmly grounded in the adolescents' self-descriptions. The primary means of within-case analyses were reading the self-descriptive words and phrases of the adolescents and examining the content and structure of the adolescents' individual profiles of self-description. These techniques were useful in producing results that remained close to the data. They were less effective, however, at reducing the large amounts of data into meaningful units. Across-case analytic methods were helpful in this regard, as they provided a way to

collapse the individual self-descriptive words and phrases into common themes of adolescent self-description. A variety of matrices were created to display the data and then systematically examined to identify common themes across the adolescents. Used alone, these across-case methods risked findings that were not meaningful and too far removed from the adolescents being studied. A careful blend of within-case and across-case analytic techniques facilitated identification of findings that were both accurate and meaningful interpretations of the adolescents' self-representations.

The analytic process is described here in stages, and analysis did progress in a relatively step-wise fashion. However, there was fluidity between the various stages and approaches to the data. As preliminary patterns of self-description emerged for active adolescents in the matrices, for example, the sets of self-descriptors for those adolescents were re-read to see if the pattern seemed to be a good fit for those individual adolescents. Similarly, when no patterns readily emerged, the self-descriptive words and phrases written on the index cards were reviewed for direction. This type of analytic approach includes consideration of the original data and its context and, therefore, promotes authenticity and credibility of findings (Milne & Oberle, 2005).

Introductory reading. Sandelowski (1995) recommends an introductory read-through of the data so later stages of analysis are rooted in larger context. At this stage of analysis, without attempting to make sense of particulars, each adolescent's set of self-descriptive words and phrases was read in entirety. Notes related to essential features of the self-descriptors, conspicuous words or phrases, and other initial thoughts were documented on the lists. Each adolescent's (n=158) set of self-descriptive words or phrases for the eighth and ninth grades were read, over the course of two weeks. Since

not all adolescents completed the task in both the eighth (n=158) and ninth (n=136) grade, a total of 294 lists were read. Thoughts and findings were recorded in a journal, so that a chronological and complete record of analysis was maintained.

Because the adolescents were instructed to include things they liked about themselves, things they didn't like about themselves, and things that worried them or that they usually kept private, lists were sometimes ordered in this way. Cursory reading of the adolescents' sets of self-descriptors provided some immediate indication that there was variation in the way that adolescents described themselves. To illustrate, compare the following lists sets of self-descriptors generated by two different eighth grade girls:

Girl 1: other people judge me as a regular person, I know I am looking real good, I consider myself a normal child, I like to go swimming, I like to go dancing, I like to go skating, I like to drive, I like to go to church, I like to sing in the choir, I like to eat, I like to talk on the phone, I like to watch TV, I love to read, I want to be a marine biologist, I love school, I do not like getting into trouble, I love my whole family, I love to travel around the world, I love parties, I enjoy running, I play basketball, I am a very talkative person, I love to sleep late, I am always travelling, I love to ski

Girl 2: nosey, kind to others, smart, not very nice to my brother, helpful to others, funny, shy sometimes, outgoing sometimes, glad to be around others most times, unsure of myself sometimes, can never make up my mind, athletic, artistic talent

The tone of the first set of self-descriptors was positive, lively, and upbeat. The use of "I" statements (a notable feature in many participants' lists) portrayed self-confidence and implied a willingness to fully claim the stated domains of self-description. The number and variety of behavioral domains that characterized this particular adolescent's self-description was striking and noted on the list. Although

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relationships were not a focus of self-description, one gets a sense that this adolescent is socially connected through common activities and interests with others.

The tone of the second list was more reserved. This adolescent's use of qualifying words, like "sometimes" and "most times", reflected uncertainty and suggested restrained commitment to the stated selves. A variety of domains were mentioned by this adolescent, including some related to relationships.

Although comparison was not an objective at this first stage of analysis, similarities and differences were obvious at times and noted as essential features on the lists. Unique words and conspicuous descriptors were similarly noted. Repetitive features identified in this initial reading provided a foundation of defining characteristics for the adolescents' self-descriptive words and phrases.

Paired comparison. Having read-through each adolescent's set of self-descriptive words and phrases, the next task was to identify the content of adolescent self-representation. Across-case analysis, as described by Ayres, Kavanaugh, and Knafl (2003), results in identification of common experience across members of the sample. Paired comparison, a technique for theme identification described by Ryan and Bernard (2003), was used to identify the common content of self-description across adolescents. This technique is appropriate for the short descriptive text data that were generated in the *All About Me* task (Ryan & Bernard, 2003).

The individual self-descriptive words or phrases, written on index cards (one idea per card), were compared in this stage of analysis. To perform the comparison, two cards were selected at random and the following questions were asked aloud: (a) how are these two self-descriptors the same, and (b) how are these two self-descriptors different?

Consider for example the following pair of self-descriptors, "I'm not as smart as my brother" and "I hate my volleyball coach". These two self-descriptive phrases were similar in that they were both were written as "I statements, both referenced a particular other person, and both had a negative connotation. However, the statements differed in that they were grounded in different domains (intelligence/academics versus sport/relationship) and one statement was an evaluation of self while the other expressed an evaluation of another person. As pairs of expressions were compared in this way, the identified similarities and differences were written on the cards. Cards with shared attributes were placed together in piles. Categories and subcategories were created and reorganized as new findings emerged. Similarities and differences that had been written on the cards became the defining characteristics of the self-descriptive categories (Ryan & Bernard, 2003).

The meaning of some words or phrases was ambiguous when examined without context. Since the adolescents were not available to provide clarification, the set of an adolescent's self-descriptive words and phrases provided context when ambiguity arose. For example, an adolescent who described herself as "sensitive" could have meant that she was easily upset or she could have been describing a more caring trait. In this example, the term "sensitive" was bordered in her list of self-descriptors by terms such as "caring", "good friend", and "kind". It was inferred, therefore, that she meant the term "sensitive" in relation to others. When context did not provide clues to the adolescent's intended meaning, the card was placed in a category labeled "ambiguous".

Incidental notes regarding decisions and process were recorded in a study journal. Given the large number of self-descriptors and repetitive nature of the task, there was

concern that the approach to paired comparison would unconsciously drift from the intended process. Asking the questions aloud before each comparison was helpful in this regard.

Paired comparison of self-descriptors continued until no new categories or subcategories were identified. Saturation occurred after approximately one-third of the 3760 self-descriptors had been compared. The remaining cards were then placed into appropriate categories. After all cards were sorted into categories, the self-descriptive words and phrases in each pile were reexamined for fit with the category. Category assignments were modified until all of the self-descriptive words and phrases were accurately sorted and classified. Considering its essential features, a name was derived for each category. Consistent with a qualitative descriptive approach, names and definitions were described in common terms that remained close to the data (Sandelowski, 2010).

The adolescent research assistants reviewed all of the cards in each category. Discussion among team members occurred when a discrepancy was identified and continued until consensus was achieved regarding which category a particular self-descriptor belonged. When the research team was satisfied that all categories accurately represented the associated self-descriptive words and phrases, a number was assigned to each category and marked at the top of each card. Paired analysis of the adolescents' specific words and phrases resulted in categories and subcategories of adolescent self-descriptors (Appendix D).

Descriptive case grids. Cards were then removed from their category piles and sorted back into sets of self-descriptors for each adolescent. Each adolescent ended up

with a set of self-descriptive words or phrases identified by associated category numbers. The number assigned to each subcategory was placed in a grid, where subcategories were grouped into three main categories of self-description, context/grounding, relationships, and behavior/behavioral roles. The grid was reproduced and used to map an inventory of each adolescent's eighth and ninth grade self-definition (Appendix E). A different color was used to highlight the subcategory number for the adolescents' endorsement of one or more self-descriptors in a particular category. All grounding/contextual self-descriptors were highlighted blue, all relationship self-descriptors were highlighted yellow, and all behavior/behavioral role self-descriptors were highlighted pink. Each color-coded grid provided a visual illustration of the adolescent's content of self-description, a form of within-case analysis. A separate grid was produced for the adolescent's eighth and ninth grade year, but placed on the same sheet to facilitate evaluation of change and stability within individual adolescents.

When the descriptive case grids were complete, the grids were examined for patterns in self-representation. Noted in review of these grids were both the content that was there and that which was conspicuously absent. Notes were documented on the grids and in the study journal.

Descriptive matrices. Two different types of matrices were created to facilitate across-case analysis of adolescent self-description: (a) a single case by category matrix and (b) a case by variable matrix for each category. Serving a common objective, these two types of matrices provided different ways of presenting the data. The case by category matrix facilitated identification of common categories of self-description across

groups of adolescents. In reverse, the case by variable matrices facilitated identification of common groups of adolescents across categories of self-description.

Case by category matrix. A case by category matrix was developed to display categories of self-description across adolescents (Appendix F). An eighth grade and ninth grade matrix were created that included each adolescent case and information about the categories of self-description used by that adolescent. Data were entered into the matrix from information contained on the sets index cards. Each column of the matrix represented an individual subcategory. The whole number in each column represented the number of times an adolescent used a particular subcategory in their self-description. The number that followed the decimal point indicated how many times the adolescent was schematic for those self-descriptors. The matrix was color-coded as previously described.

After all data were entered into the matrix, the five most active boys and girls across the eighth grade and ninth grade were compared to the five least active boys and girls across the eighth grade and ninth grade. A tool was created to allow visualization of grouped cases, but only one category at a time. The tool was held over the categories of the printed matrix and reviewed for patterns of endorsement that were unique to a particular gender or activity level. Patterns were noted and provided a starting point for examination of self-description in adolescents with less extreme levels of physical activity behavior. The eighth and ninth grade matrices were then analyzed in a similar fashion across all adolescents.

Case by variable matrix. A case by variable matrix was created for each subcategory of self-description to explore characteristics of its members (Appendix G).

For each case that endorsed a particular subcategory, the following information was included in the matrix: (a) the adolescent's average daily duration of physical activity in the eighth and ninth grade, (b) a classification of activity stability, (c) the adolescent's gender, (d) the adolescent's race, (e) the number of times an adolescent used the subcategory in self-description in the eighth and ninth grade, and (f) the number of times an adolescent was schematic for that subcategory in the eighth and ninth grade.

When a matrix had been generated for each subcategory, each was individually reviewed. Notes regarding characteristics of category members were noted. Some categories, for example, were predominantly endorsed by boys and this finding was documented on the matrix. Other incidental notes were recorded in a study journal.

Negative case analysis. Early in the analytic process, the relevance of sport related self-description became evident. Active adolescents who did not cite any sport involvement, therefore, did not follow this emerging pattern and became a particular group of interest. Negative case analysis is a strategy to establish credibility of findings in qualitative research (Patton, 1999). Following analysis of the collective participants, these adolescents were grouped separately and further analyzed. For this group of negative cases, the same four-stage analytic process was repeated. Noted patterns were documented in the study journal.

The study journal that was maintained throughout the process proved to be a useful analytic tool. Besides a record of decisions and procedures that occurred, the notes were a chronological repository of study findings. Notes hesitantly documented early in the process became important seeds for more developed ideas later in the process. Vague ideas about the adolescents' self-descriptive words and phrases grew into coherent

summaries of self-description. The same patterns that became evident in study data were reflected in the pattern of study notes.

Quantitizing. Since qualitative descriptive research is not a highly interpretive form of qualitative study, reporting the number of participants linked to particular findings and patterns is appropriate and can be useful in describing results (Chang, Voils, Sandelowski, Haselblad, & Crandell, 2009; Neergaard, Olesen, Andersen, & Sondergaard, 2009). Frequencies of self-descriptive category endorsements were, therefore, calculated with PASW Statistics 18 and reported with the qualitative results.

Chapter IV

Findings

Boys and girls in the eighth (n=155) and ninth (n=134) grade completed the *All About Me* task and generated a total of 3760 self-descriptive words and phrases. Generally, ninth graders used more self-descriptive words and phrases than eighth graders, and girls used more than boys. Descriptive analyses of the text data were conducted with PASW Statistics 18 and are presented in Table 4.1.

Aim 1: Content of Adolescent Self-Representation

There was remarkable variation in the breadth and depth of the adolescents' self-representations. Some adolescents limited disclosure to a few general self-descriptive words. Others revealed a collection of highly descriptive and deeply personal self-reflections. Irrespective of the level of detail, all adolescents reported self-description in common contextual, relational, and behavioral domains. Subtle differences in the language used to express those descriptors contributed to variation in the content of self-representation.

Contextual. Contextual self-descriptors were those words and phrases that positioned the adolescents in specific physical, emotional, developmental, and historical environments. They were personal descriptors that grounded adolescents in particular states of being and described the internal and external conditions of their self-definition. Contextual self-descriptors detailed the cognitive stance from which the self had been created and recalled. Adolescents who described their appearance, self-confidence,

health, background, mood and emotion, maturity, and significant life events revealed important information about their unique circumstance and perspective.

The influence of contextual self-descriptors was variable. Some descriptors, such as "I sometimes think of suicide", provided a great deal of context in a single phrase. Others were less significant when considered alone, but telling as a collection of similar descriptors (ie. "I like my hair", "I have nice legs", "I like my smile", and "I'm pretty").

Most adolescents in this study used at least one contextual self-descriptor in the eighth grade [n=114 (85%)] and at least one in the ninth grade [n=135 (87%)]. Some examples of contextual self-descriptors are presented in Table 4.2 and the number of adolescents who endorsed each of the various domains is presented in Table 4.3. Race and gender were considered contextual self-descriptors, although rarely mentioned by adolescents in this study.

The significance of contextual descriptors was twofold. First, self-definition in other domains assumed greater meaning when combined with those of a contextual nature. A girl's statement that read "I am having trouble in school", for example, was understood differently when coupled with the contextual information "my mom just died". Poor school performance was frequently mentioned in adolescent self-description, but the contextual experience of this particular adolescent made the statement unique.

Second, contextual self-descriptors established a tone that resonated in other domains of self-description. Satisfaction or dissatisfaction with one's appearance, for example, was a frequently cited kind of contextual self-description. Adolescents who reported only negative appearance descriptors also tended to espouse negative views of

the self in other domains. Consider the following list of self descriptors of an eighth grade girl:

get good grades, read a lot, overweight, unpopular, not very pretty, not in good shape, not good at any sports

The descriptors "overweight", "not very pretty", and "not in good shape" were all contextual self-descriptors that described a cognitive environment consistent with a generally negative view of self.

Relational.   In addition to contextual self-descriptors, it was also common for adolescents to define themselves in relation to others. With relational self-descriptors, adolescents described the nature of their associations and connections with one or more persons. In describing the presence or absence of those relationships, adolescents made reference to both specific (family, friends, boy/girlfriends, other specific people) and general others (others, people). They described themselves in terms of social position (I'm popular), their perception of how others viewed them (people think I am strange) and traits and behaviors of their own and others that contributed to the nature of those relationships (I'm a good listener, my friends help me out). Relational self-descriptors assumed both positive and negative valence.

Nearly all adolescents in the eighth [(n=148 (95%)] and ninth [n=134 (96%)] grade endorsed some kind of self-description that entailed the presence or absence of another person. Relational self-descriptors conveyed information regarding an adolescent's degree of connection with or isolation from others. Examples of relational self-descriptors are presented in Table 4.4 and the number of adolescents who endorsed each of those domains is presented in Table 4.5.

Behavioral. Like contextual and relational self-descriptors, adolescents regularly described themselves in terms of their behavior and behavioral roles. Behavioral self-descriptors included words and phrases that described the adolescents' purposeful action in chosen and assigned behavioral domains. Behavioral domains included sports, non-organized physical activity, art, academics, hobbies, work, civic involvement, religious activity, and risky behavior. Adolescents described their behavior in terms related to (a) general behavioral traits, (b) specific behavioral roles, (c) behavioral competence/achievement, (d) doing in the domain, (e) domain enjoyment, and (f) future goals or expectations (Table 4.6). Non-behavior in a domain was sometimes described by its explicit rejection. The number of adolescents who endorsed each of these domains is presented in Table 4.7.

Aim 2: Physical Activity and Adolescent Self-Representation

All adolescents described themselves in terms related to these three general domains of self-description (contextual, relational, and behavioral). Regular variation in how they were combined formed patterns of self-representations that differed between active and not active boys and girls.

Physical activity behavior. Adolescents were considered "active" if they were physically active for an average of at least 60 minutes per day. Those who did not report being physically active for an average of at least 60 minutes per day were classified as "not active". A total of 69 adolescents [n=148 (47%)] were physically active in the eighth grade, including 46 boys [n=74 (62%)] and 23 girls [n=74 (31%)]. Fifty-seven adolescents [n=134 (43%)] were active in the ninth grade, including 37 boys [n=67 (55%)] and 20 girls [n=67 (30%)].

Behavior stability across the eighth and ninth grades was evaluated for 133 adolescents (66 boys, 67 girls) who reported valid activity data in both grades. Of those 133 adolescents, 38 (29%) were active in both the eighth and ninth grades (stable active). Fifty-four (41%) were not active in either the eighth or ninth grade (stable not active). Forty-one adolescents (30%) reported behavior that was unstable from the eighth to the ninth grade, where they were active in one year and not the other. Twenty-three reported being active in the eighth grade, but not active in the ninth grade, and 18 adolescents were active in the ninth grade, but not in the eighth grade. A breakdown of activity classifications by year and gender is presented in Table 4.8.

Domains of self-representation related to physically active behavior. Physically active boys and girls often described themselves in terms of the sport domain. In fact, it was the only individual domain of self-description that was common to a majority of physically active adolescents. Being active did not entail reference to organized sport, although it was frequently mentioned by those who were. In the eighth grade, 17 of the 27 (63%) stable active boys and 7 of the 11 (64%) stable active girls used a sport related term in self-description. In the ninth grade, 20 of the 26 (77%) stable active boys and 5 of the 10 (50%) stable active girls used a sport related term in self-description.

Examples of the words and phrases used by adolescents to describe the self in the sport domain are found in Table 4.9.

Although most common among active adolescents, sport related self-definition was also found in adolescents who were not active. There were semantic differences, however, in the way physically active versus not active adolescents referenced the sport

domain. Claims of general athleticism (I am athletic), active participation (I play

volleyball), and future aspirations (I want to get through college and play professional

baseball) were more typical claims of physically active adolescents. Not active

adolescents, in contrast, tended to limit their self-description to enjoyment of the domain

that did not necessarily include their active participation (I like basketball, like sports).

Patterns of self-representation related to levels of physical activity. More

important than any individual domain of self-description were patterns of self-

representation (comprised of the adolescents' sets of descriptors) that distinguished active

and not active adolescents. Various combinations of contextual, relational, and

behavioral self-descriptors formed seven distinct patterns of self-representation. Each

adolescent's set of self-descriptive words and phrases was represented by one of those

patterns. The defining characteristics for each pattern of self-representation are

summarized in Table 4.10.

Patterns of self-representation varied among boys and girls who were active and

those who were not active or demonstrated unstable behavior. In general, physically

active adolescents described patterns of self-representation that included behavioral

descriptors. Although frequently associated with self-descriptors in the domain of

organized sport and athletics, it was the variety of activities that characterized their self-

representations. As such, patterns of *active engagement*, *grounded engagement, and*

behavior dominant were most commonly endorsed by physically active adolescents. The

other four identified patterns (*appearance dominant, relationship dominant, grounded in*

a significant event, and disengaged) were more frequently described by adolescents with

lower levels of physical activity, and generally characterized by self-representations that lacked one or more categories of self-description (contextual, relational, or behavioral).

Active engagement. Adolescents who described themselves in terms of their behavior and relationships with specific others demonstrated a pattern of active engagement. These adolescents cited their involvement in multiple behavioral domains (that often included reference to organized sport) along with description of specific family, friend, and pet relationships. Mostly positive in their self-representation, these adolescents conveyed spirit and energy that was not generally expressed by peers who did not define themselves in this way. The following self-representation illustrates a ninth grade boys' pattern of active engagement:

> *good leader, fairly good student, good in baseball, bad temper, bad sense of humor, good writer, fly a lot [Civil Air Patrol], helps community, good in hockey, good in golf, always willing to help, slow runner, good percussionist, nice person, sometimes mean, have lots of friends, mean to people when mean to me, can't wait to drive, great in golf for a freshman, mean to my brother Kris sometimes, always busy*

This boy described himself in a variety of chosen and assigned behavioral domains, (sports, fine arts, hobbies, civic engagement, academics) and made reference to specific relationships (brother, friends). Although there was individual variation in the emphasis placed on each, all adolescents who demonstrated this pattern were actively engaged in both behavioral and relational domains. Note, for example, the following eighth grade girls' list of self-descriptors:

> *nosey, kind to others, smart, not very nice to my brother, helpful to others, funny, shy sometimes, outgoing sometimes, glad to be around other people most of the time, unsure of myself sometimes, can never make up my mind, athletic, artistic talent*

Her self-represention, although more prominent in relational descriptors than the previous example, also included reference to chosen behavioral domains (athletics, art). Another eighth grade girl described herself as:

> *outgoing, I love sports, I love animals, I like to ride horses, I like to be by myself at night, but with friends in the day, I like to get good grades, My brother bugs me a lot but we live with it, I hate my hair, I wish I was like my best friend (her family life), I hate how my mom smokes*

Again, this girl described herself in terms of specific relationships (brother, best friend, mom) and multiple behavioral domains (sports, horseback riding, school).

A similar profile of self-representation was described by 52 adolescents (31 boys, 21 girls) in the eighth grade and 50 in the ninth grade (29 boys, 21 girls). As shown in Table 4.11, active engagement was relatively stable and the most frequent pattern of self-representation among physically active adolescents. Nearly one-third of adolescents who were not physically active also described themselves in terms consistent with active engagement (Table 4.12), although they were less often schematic for the underlying self-descriptors that contributed to the pattern.

Grounded engagement. Some adolescents described activity in multiple behavioral domains, but did not describe relationships with specific others. Instead, their connection to others was part of a larger social role in contextual or role-related domains (I am Mormon, I am Italian, helpful to the earth). Grounded in domains like religion, heritage, lifestyle, and civic responsibility, these adolescents revealed a pattern of grounded engagement that was characterized by high degrees of self-confidence. Being part of something larger than self provided a foundation for behavior that was based less

in the opinion of others and more in the stability such context provided. The eighth and

ninth grade self-descriptions of a boy demonstrating a pattern of grounded engagement

are as follows:

> *I am a Christian, I've been baptized, I live with both my real parents, I'm capable of getting all A's in school, I don't use drugs, I have lots of friends, good at making friends, people trust me, people care about me, I'm a saved Christian, my parents care about how good I do in school and things of that nature, I care about myself, I realize I need an education, I'm not getting the grades that I'm capable of or the ones I usually get recently, I'm sometimes lazy, I don't tell other people who I like, I don't always admit I'm a Christian, I don't always act like a Christian, I don't share certain family problems or crises*

The self-representations of adolescents who demonstrated a pattern of grounded

engagement were frequently elaborate and very descriptive. A notable example is the

following self-representation of an eighth grade girl:

> *I love to play sports, I've been in Tae Kwon Do since I was 5, I play in band, I play the saxophone, I have a mom and dad and older brother, I have 4 horses, 1 rabbit, 6 fish, and 3 dogs, I have long dark brown hair, I like having lots of friends, I try to be friends with all people, I go to church, I have a very nice neighbor named Aaron; he is the same age as me, I like having all kinds of friends, I don't judge people by their skin color, I've been to Hawaii, I've been to the Carolina Islands, my dad is from some islands near Hawaii, my grades have been improving in some classes, I have real nice cousins, my dad works at a plant right next to the Willow Run Plant, I like all animals even snakes, I love the feel of salamanders, my grandma on my dad's side has 12 kids so I have lots of cousins, I have a black belt in Tae Kwon Do, my horses lick my hands and it feels weird, I am allergic to rats, mice, hamsters, I worry about tests, I never remember what's going to be on them when I take it, I hate my thumbs because they are too small, I'm not very good in swimming, I get worried with my religion like if I'll go to heaven, I hate when a kid likes me and they are my friend; I feel real uncomfortable, I am very patriotic*

This girl's well-developed self-description was firmly grounded in contextual

elements (father's heritage, father's employment, religious beliefs) and included

reference to many behavioral domains (sports, Tae Kwon Do, band/saxophone, school).

Like active engagement, the behavioral domains of grounded engagement did not always include explicit reference to organized sport, as demonstrated in the following example:

I enjoy backpacking, I enjoy the outdoors, I am a Mormon, I am bored in school, I enjoy drawing, I know a little about computers, I think church is important, I keep a journal, I enjoy rapping, I do not spell well, I do not think it matters what others think of me as long as I'm myself, I am interested in learning things that are interesting to me, I like to be honest, I do not swear, I do not criticize others for their beliefs, I like myself for who I am, I do not want to be someone else, as I look back on the last few cards, they seem to be directing my train of thought, I do not think myself any better or worse than anyone else, I dislike tests, I want to lengthen my attention span, for backpacking I want to increase my endurance, I want to be able to keep my mind focused on one thought better, I do not like television because it's addictive, I do not use drugs, I don't smoke, in the future I want to go to college, I do not know what I want to be, I would rather not be behind a desk in the future, I like vegetables, I like to do a job once right and not do it again, I don't like to do the same thing over and over again.

This pattern of self-representation occurred most frequently among active adolescents, albeit with less frequency than active engagement (Tables 4.11 and 4.12). Six (16%) of the stable active adolescents in the eighth grade and five (14%) in the ninth grade used a pattern of grounded engagement in their self-representation, while none of the stable not active adolescents used this pattern in the eighth grade and only one (2%) did so in the ninth grade.

Behavior dominant. Seven adolescents in the eighth grade and eight in the ninth grade described a pattern of behavior dominant self-representation. These adolescents described themselves almost entirely with behavioral self-descriptors, and unlike adolescents who demonstrated patterns of active engagement or grounded engagement, they referenced few specific relationships or grounding in social context. If they acknowledged the social domain at all, adolescents who described a behavior dominant

pattern of self-representation did so only through indirect reference to their own social awkwardness and shyness. See the following set of self-descriptors from a ninth grade boy:

> *I like to draw, I am pretty good at it, I like to play war, I really like to write scary stories, I'm shy, I have good determination, I like to read a lot, I hate math, I can play certain sports fairly well, I'm allergic to cigarette smoke*

They described themselves primarily with behavioral descriptors, with frequent reference to hobbies and other chosen behavior. They described relative confidence in their behavioral ability. Six boys in the eighth and ninth grades used this pattern of self-representation compared to only one and two girls in the eighth and ninth grades, respectively. An eighth grade boy depicts a behavior dominant pattern of self-representation in the following self-description:

> *I like sports, I like to build and paint models, I like to play Dungeons and Dragons, I get so-so grades, I hate school*

A similar pattern was observed in this ninth grade boy:

> *I like to play football, I like to play basketball, I like to work on cars, I don't like to get up early for school, I am very patriotic*

Again, multiple behavioral domains are mentioned in isolation. A similar profile was used by this eighth grade boy:

> *a pilot someday, bike rider, music listener, r/c car driver, animal lover, want better grades, want to graduate, getting tired of school*

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Appearance dominant. For some adolescents, behavioral and relational self-descriptors were overshadowed by appearance related contextual self-descriptors. These adolescents referenced their appearance both in a general sense (I am pretty) and with respect to specific body parts (I have huge feet). They used positive, negative, and neutral words in describing their appearance.

An appearance dominant pattern of self-representation was used exclusively by adolescent girls and was generally associated with low levels of physical activity. Although only six adolescents (all girls) used an appearance dominant pattern of self-representation, it was a very stable form of self-representation. All six girls who described themselves primarily in terms related to their appearance in the eighth grade, continued to do so in the ninth grade. By way of example, the following are the eighth and ninth grade self-representations of one adolescent girl:

> *Eighth grade: I do good in school, I am short, I have long blond hair, I can't spell that good, I am an understanding person, I have green eyes*

> *Ninth grade: I am short, I guess I'm pretty, I have long hair, I have long nails*

The following eighth grade self-representation was from an adolescent girl. Note how other domains are represented in her self-representation, but it is dominated by reference to appearance-related contextual descriptors:

> *I am tall, I have been adopted, I am pretty, I am outgoing, I have very pretty eyes, I have a lot of friends, I am good in school, I try hard and don't give up easy, I am okay in algebra, I have great parents, I have long legs, I am 5 ½ inches tall, I have a great body, I feel great all the time, I am very strong, I can play with children great, children love me, I have great hair, I am not addicted to any drugs, I don't need medication, I am flexible, I have great clothes, I have perfect ears, I love my mouth and lips, I tan easily, I have big double size hands, I have*

great big feet, I have short nails, no one stocks size 12 women's shoes, I have my period once a month, I am very tall

Although boys did include appearance related contextual descriptors (tall, nice smile), it was a phenomena of adolescent girls for appearance related self-description to dominate their self-representations. It was also associated with inactive behavior. Five of the six girls who used an appearance dominant pattern of self-representation were considered stable not active and one demonstrated an unstable pattern of physical activity.

Relationship dominant. Some adolescents in their self-representation described little behavior or context, and instead focused on their relationships. With frequent reference to specific others, adolescents described the nature of those relationships and contributing social behaviors. The set of self-descriptors from the following eighth grade girl demonstrates the multiple ways relationships were described in a relationship dominant pattern of self-representation:

> *the thing I like about myself is my good personality, what I would like to do when I grow up is take care of children like in a daycare, I usually get good grades but I sometimes get lazy, I'm not very good a making new friends because I'm sometimes shy, I get along with most anyone I meet, I like all of my friends I meet but if they're rude or snobs, I don't hang around them*

Both positive and negative relationships were described with reference to specific others (I have great parents) or in terms that suggested more general connection or disconnect (I don't fit in). The following is from an eighth grade girl, demonstrating a relationship dominant pattern of self-representation:

nice to all people, helpful to other people, very caring to all things, sociable, when I get upset I scream at other people and then I feel bad, I have a very bad temper, can't control my temper, I have trouble keeping my friend's secrets to myself

In both the eighth and ninth grades, stable not active girls were most likely to endorse a relationship dominant pattern of self-representation Nearly one-third of stable not active adolescent girls described themselves primarily in terms of their relationships, and one-quarter of girls with unstable physical activity patterns did so (Tables 4.12 and 4.13). No stable active adolescents described themselves in this way (Table 4.11).

Grounded in significant events. For some adolescents, other aspects of the self were eclipsed by a significant life event. This pattern of self-representation was typically negative and included few positive relationships or chosen behaviors. The following list of self-descriptors is from an eighth grade boy:

I don't smoke, I don't drink, I like to help people out, I'm always willing to do something for nothing, I'm fair, glad that I'm not getting hit anymore, mom is not hitting me anymore, not popular, run my mouth too much, act stupid

For some adolescents, it was the enormity of the event that seemed to dominate the self-representation. Consider, for example, the following self-representation of an eighth grade girl:

I can swim fast, like my eyes, don't like my hair, don't like my fingernails, I hate my grandfather, my grandma died of suicide

For others, it was the frequency with which they described a particular event that rendered it significant. For example, an eighth grade girl described the marital problems of her parents and its personal impact multiple times in her self-representation:

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I'm nice most of the time, I get along with people pretty well, I am very sensitive, my moods change just about every minutes, my parents worry me, I don't like my face, I can keep good secrets, my parents are divorced, my dad is remarried, they are split up for the moment, I live with my father, I'm organized most of the time

Self-representation in terms of a significant life event was the least stable pattern of self-representation. The same girl who described herself in terms of her grandmother's suicide, for example, did not reference this significant event in the ninth grade. Instead, she described herself with a more disengaged pattern of self-representation (to be described in an upcoming section). Most adolescents reported this pattern of self-representation in only their eighth grade year, and described a different pattern in the ninth grade.

The self-representations of 10 adolescents (3 boys, 7 girls) in the eighth grade and 2 girls in the ninth grade were grounded in significant life events. This pattern of self-representation was often associated with not active behavior. Only one girl (10%) who demonstrated this pattern of self-representation was physically active in eighth and ninth grade (Table 4.11). Five (50%) were not active in either the eighth or ninth grade (Table 4.12).

General disengagement. Finally, some adolescents reported a state of general disengagement that was characterized by a lack of self-description in any chosen behavioral domain, absence of specific relationships, and little contextual information. The content of this type of self-representation was often vague, as in the following self-representation of an eighth grade boy:

good about myself, smart, healthy, sensitive

Disengaged adolescents professed qualities that implied the presence of others (ie. nice, caring, helpful, mean, annoying, etc.), but failed to describe connections with specific persons, groups, activities, or environments. Generally, these adolescents had little at all to say in regard to their self-representation. The following self-descriptions of an eighth grade boy typifies a self-descriptive pattern of general disengagement:

> *average, funny, talkative, too talkative in class, don't like homework, too risky, try stuff like smoking*

Disengaged patterns of self-representation were used by both boys and girls. The following are the self-descriptive words used by a ninth grade girl:

> *honest, nice, smart, kind*

Adolescents who described disengaged patterns of self-representation frequently used few self-descriptive words and phrases, but that was not always the case. At first glance, for example, the self-representation of this ninth grade boy appeared to reference multiple domains of engagement. Upon closer examination, however, it was discovered that this was not the case.

> *I like some of the same music as other people, I don't tell hardly anyone my true feelings, I don't have any friends good enough to "open up" to and discuss problems with, I have many problems that no one knows about, I keep a lot of things to myself, I can't talk to my parents about problems, I'm very active and usually hyper, I have a somewhat short temper, I have experienced more things that I can't do well than I can, I find this discouraging, I am hard working and can complete most things as good as any adult can, I do a lot of labor work, such as brick laying, have been emotionally hurt too much so find it hard to trust people, I trust basically no one, my best friend is me, I have a lot of friends but can't open up to them, I'm very smart, I'm academically lazy*

Consistent with a disengaged pattern, his self-representation lacked description in contextual, relational, and behavioral domains. There is vague reference to "doing things" and a single reference to a particular activity in brick laying. Friends are also mentioned, but one does not get a sense that there any of these things provide him with a sense of engagement or connection. This failure to describe connections in any domain embodies a disengaged pattern of self-representation.

General disengagement was fairly stable in boys and girls across the transition from eighth to ninth grade. Physically active adolescents infrequently used a disengaged profile of self-representation. Only one (4%) stable active boy demonstrated this pattern in the eighth grade and two (8%) in the ninth (Table 4.11). No stable active girls described a disengaged pattern of self-representation. In contrast it was a frequently used pattern among not active adolescents, including seven (39%) boys and nine (25%) girls in the eighth grade and eight (47%) boys 10 (28%) girls in the ninth grade (Table 4.12).

Self-representations of stable active adolescents differed from those of not active and unstable active adolescents. The frequency of patterns of self-representation endorsed by active, not active, and unstable levels of physical activity are presented in Tables 4.11, 4.12, and 4.13 respectively.

Chapter V

Discussion

In summary, this study found that adolescents described themselves in three general categories of self-description: contextual, relational, and behavioral. Based on these three categories, seven patterns of self-representation distinguished between active and not active adolescents. Consistent with previous literature (C. B. Anderson, 2004; Kendzierski, 1988, 1990; Robbins et al., 2004), the spontaneous self-descriptions of many physically active adolescents included those that were explicit to sports, athletics, and other physically active behavior. More interesting, however, were their overall patterns of self-representation that included a variety of activities and both specific relationships and general social roles. Attention to the differences in patterns of self-representation between active and not active adolescents contributes to a better understanding of the cognitive environment associated with physical activity in adolescence.

Since Kendzierski (1988, 1990; Kendzierski, Furr, & Schiavoni, 1998) first described a relationship between exercise schemas and exercise behavior, a significant body of literature has developed to support the functional role of self-schemas in behavioral regulation. Findings of this study are no exception and provide further evidence that self-definition in domains of sport and physical activity is related to physically active behavior. Given these findings, it is tempting to move ahead with interventions that promote development of physically active self-schemas in hope that

they will provide a cognitive mechanism for adherence to physical activity. To do so, however, would ignore the fact that self-definition in domains of sport and physical activity did not fully account for differences in physically active behavior. The whole of adolescent self-representations have important implications for behavior.

Consistent with results from previous studies (Corte & Zucker, 2008; Stein & Corte, 2008; Stein, Corte, & Ronis, 2010), this study found it was the adolescents' collection of self-descriptive content that was associated with behavior. Stein et al. (2010) previously reported that personal identities that included few positive self-schemas and many negative self-schemas that were highly interrelated predicted disordered eating behaviors in 66 Mexican American women. Corte and Zucker (2008) found a similar relationship in a sample of 264 adolescent boys and girls. In a three-year longitudinal study that examined cognitive vulnerability and drinking behavior, adolescents with healthy self-concepts (many positive self-schemas and few negative self-schemas) were compared to adolescents with vulnerable self-concepts (many negative self-schemas and few positive self-schemas). Although analyses failed to find significant difference between the groups with respect to whether the adolescents drank or got drunk, among those who did drink or get drunk, there were significant differences in the age at which they initiated drinking. Consistent with the qualitative findings of this study, these studies support that the content and structure of the self is associated with behavior.

Since physically active behavior was associated with patterns of self-representation, it follows that physically active behavior is best understood in the context of the adolescents' overall self-representation. As previously suggested, interventions that are limited to a single domain of self-description and do not address the overall pattern of self-

representation may be too simplistic to effect behavior change. This study demonstrated that patterns of self-representation differed between physically active and not active adolescents and the nature of those differences has significant implications for how interventions might proceed.

Differences in Self-Representation Related to Physical Activity in Adolescence

Physically active adolescents typically described themselves in rich detail, with many self-descriptors in a wide variety of domains. Patterns of active engagement, grounded engagement, those that were behavior dominant were mutually defined by their inclusion of self-description in multiple behavioral domains and activities. Patterns of active engagement and grounded engagement also included an element of social connection, either in specific relationships (active engagement) or in larger social roles (grounded engagement). These adolescents were generally characterized by high levels of engagement in activities and significant social connection.

In contrast, adolescents with low levels of physical activity most commonly described themselves with patterns of self-representation that included few domains of self-description and one or more categories were often absent (relationship dominant, appearance dominant, grounded in significant events, and general disengagement). Adolescents who did not include behaviors, activities, or relationships in their self-representation, revealed limited levels of engagement and social connection.

This is not meant to suggest that physical activity was responsible for adolescents developing elaborate, highly differentiated patterns of self-representation. Nor is it meant to imply that every adolescent whose self-representation was consistent with an active pattern was necessarily physically active. Rather, it was found that physically active

behavior is associated with patterns of self-representation and some patterns of self-representation are more compatible with physical activity than others.

Physically active behavior and patterns of self-representation. Results of this study point to differences in self-representation between physically active and not active adolescents. Those differences were not limited to a single domain of active behavior. Variation was found in the number and content of the self-descriptors that made up the patterns of self-representation.

Pattern compatibility with physically active behavior. Results of this study also suggest that some patterns of self-representation are more compatible with physically active behavior than others. Those that included reference to many behavioral domains and relationships were generally associated with high levels of active behavior. Patterns of self-representation that included few self-descriptors, with little reference to activities and relationships were related to less physically active behavior. These findings are consistent with a more general approach to positive youth development theory. Positive youth development theory is based in an applied field with a developmental-contextual focus (Benson et al., 2006). From this perspective, positive youth development is supported by the presence of developmental assets in an adolescents' environment, including things like positive relationships, opportunities, skills, values, and self-perceptions (Scales, Benson, Leffert, & Blyth, 2000). Greater numbers and greater variety of developmental assets predict positive youth development. This effect was demonstrated in the academic outcomes of 370 seventh through ninth graders in a study conducted by Scales, Benson, Roehlkepartain, Sesma, and van Dulmen (2006). Increase in the number of developmental assets was significantly associated with increases in the adolescents' grade point averages. The effects were stable over time, as

the more assets participants reported in the 7th to 9th grade reported, the higher their grade point average in the 10th to 12th grade.

Results of this current study revealed patterns self-description among physically active adolescents that implied engagement and connectedness. Engagement and connectedness has been shown to be related to healthy behaviors and positive outcomes. Witherspoon, Schotland, Way, and Hughes (2009) examined the grades, self-esteem, and depressive symptoms of 437 ethnically diverse middle school students with respect to their patterns of connection to their family, school, and neighborhood. Results showed that connectedness in multiple domains was significantly associated with positive outcomes. The multiple specific relationships described by adolescents in this current study are indicators of their own positive development.

Activities and social connections contribute to positive development by providing opportunity for identity exploration (Eccles et al., 1989; Harter, 2003; Kroger & Green, 1996). Barber, Stone, Hunt, and Eccles (2005) described how behavior in chosen domains provides adolescents with a context for self-expression, exploration, and identity development. A combination of activities and peers create a particular culture of adolescence that is linked to identity exploration. Within the context of these established relationships and activities, adolescents have a sense of belonging that allows freedom to try their hand in new or less assured behaviors. From this perspective it follows that adolescents who engage in greater numbers of activities and relationships will have more spontaneous opportunity for physically active behavior and will be more likely to do so. This conclusion is echoed in positive youth development theory, where Benson et al. (2006) suggest that increasing the number of developmental assets across domains

matters more than increasing strengths in any one setting. Those opportunities are founded in the multiple behaviors and social relationships articulated by physically active adolescents.

Clinical Implications

A primary assumption underlying positive youth development theory is that all youth are inherently capable of achieving a positive developmental trajectory, given adequate numbers of opportunities, supports, and other developmental assets (Benson et al., 2006). Physical activity, with a constellation of other activities, contributes to thriving in youth and healthy outcomes (Benson et al., 2006). Therefore, if the goal is to increase physically active behavior, one should not consider the domain in isolation. For adolescents with varied patterns of self-representation, from a positive youth development perspective it would be most effective to start from an adolescents' identified strengths (Scales, Benson, & Roehlkepartain, 2011). This perspective is consistent with identity theory that speaks to the issue of fit in the process of identity exploration. Opportunities that do not fit with one's current collection of self-representations are not likely tried, or if tried would not be considered relevant to self-definition (Oyserman et al., 2006; Oyserman & Fryberg, 2006). In order for behavior to occur, an opportunity must contain some element rendering it consistent with the adolescent's self-concept (e.g., others look like me, the activity looks like something I do, this feels like something I can do) (Oyserman, 2007).

It is a plausible hypothesis, given the results in this study, that building a more differentiated set of self-representations, across a variety of activities and relationships would create a cognitive structure more compatible with physically active behavior. A

more reasonable approach toward interventions to promote physical activity, therefore, is to consider the pattern of self-representations and develop interventions that address the problem of inactivity from a broader base. By first determining which domains of self-description are already important to an adolescent, and then purposefully building representations into the established cognitive environment, it is likely that interventions will be more effective in producing behavior change (Scales et al., 2011). As the adolescent increases the number and variety of domains of self-description, the pattern of self-representation should theoretically become more compatible with active behavior.

Implications for Future Research

This study has advanced understanding, but also prompted new questions regarding the relationship between adolescent self-representation and physically active behavior. Before going much further in this line of inquiry, however, a prospective study is needed to test whether patterns of self-representation do in fact predict physically active behavior. It can be hypothesized from results of this study that adolescents who describe patterns of active engagement, grounded engagement, and behavior dominant will be more physically active than those with relationship dominant, appearance dominant, grounded in significant event, and disengaged patterns of self-representation. Empirical testing of this hypothesis is needed to provide further evidence that patterns of self-representation are important to understanding physically active behavior in adolescence.

Additional research is also needed to provide more detailed understanding of the identified patterns of self-representation and related physically active behavior. Many questions remain, but three primary issues should first be addressed. First, it is

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particularly important to consider how patterns of self-representation change across development and how those changes might relate to known decreases in adolescent physical activity. A longitudinal study where self-representation and physically active behavior are measured at multiple time points would allow this question to be examined.

Second, it is necessary to consider the role of self-schemas in patterns of self-representation related to physical activity. This study demonstrated that self-description in contextual, relational, and behavioral domains provided a foundation for patterns of self-representation related to physically active behavior, but did not differentiate between schematic and non-schematic self-description. Given the previously established relationship between self-schemas and behavior, it is possible that the schematic nature of those self-descriptors is relevant and warrants further study. Studies such as these would contribute to a better understanding of adolescent self-representation and physically active behavior.

Finally, it is necessary to better understand the patterns of self-representation and related levels of physically active behavior among not active adolescents in this study. Since this group represented all adolescents not meeting recommended levels of physically active behavior, there is large variation in this group. Some adolescents were essentially inactive, while others nearly met recommended levels of activity. Given greater variety in patterns of self-representation used by not active adolescents, differences with respect to physical activity levels were not captured in this study and need to be further examined.

Limitations

      This study advances understanding of self-representation and physical activity in adolescents. These findings, however, must be interpreted with respect to identified study limitations. A primary limitation of this research was that the data were collected in 1992 and 1993. Since that time much has changed in the domain of physical activity that may impact related adolescent self-representations. For example, the recommended duration and frequency of active behavior has increased from 20 minutes of moderate to vigorous activity on at least three days per week (U. S. Department of Health and Human Services, 1992) to the currently recommended 60 minutes every day (U. S. Department of Health and Human Services, 2008). In attempt to address this particular change, current behavior recommendations were used to classify adolescents in this study as active or not active. It is unclear, however, how other changes in the domain might influence the nature of adolescent self-representations. Further study will be needed to determine if similar findings are relevant in a more contemporary sample.

      The physical activity measure was a source of two other potential limitations. First, data were collected by self-report. Although a common method of collecting information about individual physical activity behavior, in some cases there is potential that adolescents may have over-reported activity levels. Since the physical activity measure was closed-ended, it may have failed to identify adolescents who were active but did not engage in one of the listed activities. An objective measure of activity might have more accurately captured actual levels of activity and more spontaneous activity not be captured by the closed-ended measure. The primary phenomena of interest in this study, however, were the adolescents' self-representations. So, for the purpose of dividing

adolescents into categories – physically active and not active – self-reported data from the CAAL were sufficient.

Second, adolescents were classified as active or not active according to whether they reported engaging in an average of 60 minutes of physically active behavior per day or not. The use of rigid limits to dichotomize the adolescents into two groups resulted in some very active adolescents (albeit not at recommended levels) being considered not active. Discrepancy in patterns of self-representation associated with high or low levels of activity could be attributed to this imposed restriction. It is also possible that some of the variation in patterns of self-representation found in not active adolescents could be better explained by separating adolescents who are essentially inactive from those who engage in at least modest levels of activity.

Finally, this study was subject to limitations inherent to secondary analysis (Hinds, Vogel, & Clarke-Steffen, 1997). Previously collected data present unique challenges to naturalistic inquiry. Since the sample was not purposefully selected, for example, some adolescents were less represented than others. When adolescents were assigned to either active or not active status, only 11 adolescent girls but 26 boys were found to be active in both the eighth and ninth grades. Given this disparity, it is possible that active girls were underrepresented and additional patterns related to physically active behavior may have been evident if there had been opportunity to purposefully sample or seek additional responses.

Conclusions

Despite its limitations, results of this study contribute to a better understanding of the relationship between physically active behavior and adolescent self-representations.

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Patterns of self-representation were identified that distinguished physically active and not active adolescents. At least through the developmental period of middle adolescence, physically active behavior does not appear limited to self-representations explicit to the domain. Interventions may need to address broader issues of active engagement.

Table 3.1

Frequency Distribution of Participant Demographic Characteristics

Participant characteristics	Grade 8	Grade 9
N	158	140
Age (mean years)	13.53	14.45
Gender (frequency/percent)		
Male	80 (50.6)	71 (50.7)
Female	77 (48.7)	69 (49.3)
Race (frequency/percent)		
Black	21 (13.3)	17 (12.1)
White	130 (82.3)	117 (83.6)
Other race	4 (2.5)	4 (2.9)

Table 3.2

Estimated MET Values for Activities in the CAAL

Activity	Estimated MET value[a]	Activity intensity
walking	3.6	moderate
jogging/running	8.5	vigorous
ice/roller skating	7.0	vigorous
swimming for fun	4.0	moderate
swimming laps	9.9	vigorous
bicycling	6.2	vigorous
aerobic/other dance	5.5	moderate
volleyball	4.0	moderate
football	8.8	vigorous
softball/baseball	5.0	moderate
soccer	8.8	vigorous
tennis	7.0	vigorous
basketball	8.2	vigorous
ice hockey	8.0	vigorous
recess games	5.0	moderate
snow activities	5.0	moderate

[a] assuming moderate effort (Ridley et al., 2008)

Table 3.3

Correlation Between Activity Reported on the CAAL and Other Activity-Related

Measures

Activity-related measures	CAAL	
	Grade 8	Grade 9
N	148	134
How often are you active?	.37 (.00)[a]	.37 (.00)
Athletic subscale[b]	.33 (.00)	.35 (.00)
Athletic[c]	.32 (.00)	.34 (.00)
Out of shape[c]	-.22 (.01)	-.26 (.00)

[a]Pearson Product Moment correlation coefficient, significance
[b]Self-Perception Profile for Adolescents
[c]Me Now and in the Future

Table 3.4

Analytic Strategies

Approach	Objective	Strategy
within-case	obtain a general sense of adolescent self-description	introductory read-through of the lists of self-descriptors for each adolescent (Sandelowski, 1995)
across-case	identify content categories of adolescent self-description	paired comparison of self-descriptors for similarities and differences (Ryan & Bernard, 2003)
within-case	examine patterns of self-description within adolescents	creation of descriptive case grids (Miles & Huberman, 1994)
across-case	examine patterns of self-description across adolescents	creation of descriptive category matrices (Miles & Huberman, 1994)

Table 4.1

Text Data Descriptives

Self-descriptor variables	Eighth grade		Ninth grade	
Gender	Boys	Girls	Boys	Girls
N	78	77	67	67
Self-descriptors				
Total number across participants	895	1024	824	1017
Range of self-descriptors per participant	4-52	2-52	2-52	4-53
Mean number per participant	11.3	13.1	12.1	15.0
(standard deviation)	(7.3)	(8.3)	(8.9)	(11.3)

Table 4.2

Examples of Contextual Self-Descriptors

Content subcategories	Examples
Appearance	I'm pretty
	I love my hair
	I'm short
Self-confidence	I like myself for who I am
	I am myself, not anyone else's shadow
	A lot of the time, I don't stand up for myself
Health	I'm healthy
	I have diabetes
	I don't brush my teeth enough
Background	I'm from Buffalo, NY
	I live on a farm
	not rich, not poor, in between
Mood/emotion	moody
	almost always happy
	afraid
Maturity	I like to take care of myself
	I hate to be babied
	dependent
Significant life events	My dad beats his wife
	I was once almost raped in a car of boys
	My grandmother died of suicide

Table 4.3

Frequency of Contextual Self-Descriptors

	Eighth grade		Ninth grade	
Gender	Boys	Girls	Boys	Girls
N	78	77	67	67
Content subcategories				
Appearance	35 (45)[a]	51 (66)	33 (49)	38 (57)
Self-confidence	17 (22)	23 (30)	18 (27)	25 (37)
Health	15 (19)	14 (18)	12 (18)	14 (21)
Background	13 (17)	15 (19)	10 (15)	8 (12)
Mood/emotion	12 (15)	15 (19)	15 (22)	33 (49)
Maturity	7 (9)	15 (19)	12 (18)	7 (10)
Significant life events	7 (9)	14 (18)	1 (1)	7 (10)

[a]frequency (percent)

Table 4.4

Examples of Relational Self-Descriptors

Content subcategories	Examples
Family	I have one brother and one sister
	I like going on trips with my family
	My stepfather hates me
Friends	I love my best friends like sisters
	I like to be with friends
	I listen to my friends problems
Boy/girlfriends	I like being with my boyfriend
	I don't have a boyfriend
	My boyfriend helps me a lot
Specific others	I like my coach
	I've got real nice teachers
	I'm really good with little kids
Pets	I have a baby kitten at home
	I have a pet
	I have 4 horses, 1 rabbit, 6 fish, and 3 dogs
General others	I enjoy other people's company
	I'm popular
	People care about me

Table 4.5

Frequency of Relational Self-Descriptors

	Eighth grade		Ninth grade	
Gender	Boys	Girls	Boys	Girls
N	78	77	67	67
Relationship categories				
Family	40 (51)[a]	46 (60)	26 (39)	32 (48)
General others	40 (51)	43 (56)	34 (51)	33 (49)
Friends	26 (33)	37 (48)	29 (43)	33 (49)
Boy/girlfriends	12 (15)	14 (18)	8 (12)	18 (27)
Pets	5 (6)	15 (19)	6 (9)	12 (18)
Other specific people	5 (6)	11 (14)	6 (9)	3 (4)

[a]frequency (percent)

Table 4.6

Examples of Behavioral Self-Descriptors

Content subcategories	Examples
School	smart person in school good student I am having trouble in school
Sports	I am really great at volleyball I like sports baseball player
Hobbies	good with computers I love to design cars I like to collect things
Non-organized physical activity	I enjoy backpacking I like to ride horses I take walks out into the woods
Risky behavior	I smoke I drink I used to smoke weed
Art	I'm good at art I play the flute Singer
Work	I enjoy working in the summer I work at Campus Donuts Farmer
Religious activity	I enjoy studying religious works I go to church a lot I don't always act like a Christian
Civic involvement	I am patriotic I like to volunteer I am involved in scouts

Table 4.7

Frequency of Behavioral Self-Descriptors

	Eighth grade		Ninth grade	
Gender	Boys	Girls	Boys	Girls
N	78	77	67	67
Behavior categories				
School	64 (82)[a]	49 (64)	49 (73)	41 (61)
Sports	50 (64)	31 (40)	47 (70)	22 (33)
Hobbies	28 (36)	21 (27)	24 (36)	17 (25)
Non-organized physical activity	22 (28)	11 (14)	13 (19)	11 (16)
Risky behavior	13 (17)	20 (26)	12 (18)	16 (24)
Art	11 (14)	15 (19)	11 (16)	17 (25)
Work	9 (12)	12 (16)	9 (13)	8 (12)
Religious activity	7 (9)	3 (4)	8 (12)	4 (6)
Civic involvement	3 (4)	3 (4)	6 (9)	4 (6)

[a]frequency (percent)

Table 4.8

Activity Classification by Year and Gender

		Eighth grade	
		Not active	Active
Ninth grade	Not active		
	Boys	18	12
	Girls	36	11
	Active		
	Boys	9	27
	Girls	9	11

Note. Table includes only those adolescents who provided activity data in both the eighth and ninth grades (n=133)

Table 4.9

Examples of Sport Self-Descriptors

Category	Examples
Trait	Athletic Sporty Sportsman
Role identity	Varsity wrestler Swimmer Baseball player
Competence/Achievement	I can swim fast Good in hockey I'm good at ballet
Doing/playing	I play volleyball I run track Do gymnastics
Enjoyment	I love sports I like basketball Love track and field
Future goals	Want to be a pro football player I have one goal and that is to play college basketball I want to set lots of sports records
Sport related	Collect sports cards Like reading *Sports Illustrated* I like how people cheer when I get a good hit

Table 4.10

Patterns of Self-Representation with Defining Characteristics

Pattern	Defining characteristics
Active engagement	Behavioral descriptors and specific relational descriptors
Grounded engagement	Behavioral descriptors and contextual social role descriptors
Behavior dominant	Dominated by behavioral descriptors
Appearance dominant	Dominated by contextual appearance descriptors
Relationship dominant	Dominated by specific relational descriptors
Grounded in significant event	Dominated by a contextual negative life event
Disengaged	Lack of contextual, specific relational, or behavioral descriptors

Table 4.11

Pattern of Self-Representation of Active Adolescents

	Stable active Boys		Stable active Girls	
	Grade 8	Grade 9	Grade 8	Grade 9
Active engagement	18 (69)[a]	16 (64)	6 (55)	7 (64)
Grounded engagement	4 (16)	4 (16)	2 (18)	1 (9)
Behavior dominant	2 (8)	2 (8)	0 (0)	0 (0)
Appearance dominant	0 (0)	0 (0)	0 (0)	0 (0)
Relationship dominant	1 (4)	1 (4)	2 (18)	2 (18)
Grounded in	0 (0)	0 (0)	1 (9)	0 (0)
Disengaged	1 (4)	2 (8)	0 (0)	0 (0)

[a]frequency (percent)

Table 4.12

Pattern of Self-Representation of Not Active Adolescents

| | Stable not active | | Stable not active | |
| | Boys | | Girls | |
	Grade 8	Grade 9	Grade 8	Grade 9
Active engagement	7 (39)[a]	6 (35)	8 (22)	7 (19)
Grounded engagement	0 (0)	1 (6)	0 (0)	0 (0)
Behavior dominant	0 (0)	1 (6)	1 (3)	1 (3)
Appearance dominant	0 (0)	0 (0)	5 (14)	5 (14)
Relationship dominant	1 (6)	1 (6)	11 (31)	12 (33)
Grounded in	3 (17)	0 (0)	2 (6)	1 (3)
Disengaged	7 (39)	8 (47)	9 (25)	10 (28)

[a]frequency (percent)

Table 4.13

Pattern of Self-Representation of Activity Unstable Adolescents

	Activity unstable Boys		Activity unstable Girls	
	Grade 8	Grade 9	Grade 8	Grade 9
Active engagement	6 (29)[a]	7 (33)	7 (37)	7 (37)
Grounded engagement	1 (5)	1 (5)	0 (0)	0 (0)
Behavior dominant	4 (19)	3 (14)	0 (0)	1 (5)
Appearance dominant	0 (0)	0 (0)	1 (5)	1 (5)
Relationship dominant	1 (5)	2 (10)	4 (21)	5 (26)
Grounded in	0 (0)	0 (0)	4 (21)	1 (5)
Disengaged	9 (43)	8 (38)	3 (16)	4 (21)

[a]frequency (percent)

Appendix A

Research Assistants' Script for Delivery of the All About Me Task

"Now I am going to ask you to tell me about yourself. On each card write down one thing that will tell me about who you are. You can include anything that is important to you.

What matters most is that you write down the things that are important to you. These things may tell about how you are like other people or how you are different from them. You can include the good things as well as the things you don't like about yourself. There are no limits!

Your job is to describe yourself as well as possible. Feel free to put down whatever matters to you. There are no 'right' or 'wrong' answers!

You can write down as many things as you like but please write only one thing on each card. Don't worry about how many cards you use. There is no number that is either 'right' or 'wrong'."

Appendix B

Sample of Adolescent Self-Representation List Data

1001

A   Friendly

B   Funny

C   Brother

D   Good student

E   Basketball player

F   Likes sports

G   Kind of short

H   Blonde hair

'

Appendix C

Sample of Reproduced Index Card Data

Front of Card

friendly

Back of Card

1001 A
Male
8th Grade
White

positive
Importance: 10
Certainty: 10
Schematic

Appendix D

Categories and Subcategories of Adolescent Self-Descriptors

General Categories	Domains	Subcategories	
Contextual Descriptors	Background	111	heritage
		112	where I live
		113	lifestyle
		114	what I've been through
	Physical appearance	121	I like the way I look
		122	I like my…
		123	I don't like the way I look
		124	I don't like my…
		125	I'd like to look different
		126	neutral physical characteristics
		127	clothes, glasses, makeup
	Health	131	healthy
		132	eat and sleep
		133	bad habits
		134	sick
		135	worry about health
	Mood/emotion	141	moody and emotional
		142	happy
		143	sad
		144	mental health
	Psychosocial dvelopment	151	mature
		152	resist/resent authority
		153	immature
	Self-confidence	161	I am my own person
		162	insecure
Relational Descriptors	Negative relationships	212	don't get along with family
		213	family is/does to me
		214	I am/do to family
		222	don't have many friends
		223	peers are/do to me

	224	I am/do to friends
	232	don't have a boy/girlfriend
	233	boys/girls are/do to me
	234	I am/do to my boy/girlfriend
	235	hard time meeting boys/girls
	242	don't get along with…specific
	243	others are/do to me
	244	I am/do to specific others
	252	pets are too much work
	253	pets are/do to me
	254	I am/do to pets
	262	people don't like me
	263	people are/do to me
	264	I am/do to people
	265	hard time meeting new people
Positive relationships	311	being with family
	312	close with family
	313	family is/does for me
	314	I am/do for my family
	315	future family
	321	being with friends
	322	have lots of friends
	323	friends are/do for me
	324	I am/do for my friends
	325	make friends easily
	331	being with boy/girlfriend
	332	have a boy/girlfriend
	333	boy/girlfriend is/does for me
	334	I am/do for my boy/girlfriend
	341	being with specific others
	342	like…specific other
	343	others are/do for me
	344	I am/do for others
	351	being with pets
	352	love my pet
	353	pets are/do for me
	354	I am/do for my pet
	361	being with general others
	362	people like me
	363	people are/do for me
	364	I am/do for people
	365	I like meeting new people

Behavioral Descriptors	General activity	400	busy/active
		401	got plans
		402	I get confused
	Athletics	411	athletic
		412	"er" sport
		413	good at sport
		414	play sport
		415	like sports
		416	goals in sports
		417	sport related activity
		418	don't play sport
	Physcal activity	422	"er" active behavior
		423	good at active behavior
		424	do active behavior
		426	goals for active behavior
		427	activity related preferences
		428	not very active
	Arts	431	artistic/creative
		432	"er" arts
		433	good at art
		434	do art
		435	like art
		436	goals in art
		438	not artistic
	Academic	441	smart
		442	student
		443	do well in school
		444	try hard in school
		445	like school
		446	college
		451	not smart
		453	don't do good in school
		454	don't do my schoolwork
		455	don't like school
		456	worry about grades
	Hobbies/interests	462	"er" hobbies
		463	good at hobbies
		464	do hobbies
		465	like hobbies
		466	goals in hobbies
		468	don't like particular hobbies

Work	472	"er" work
	474	I work
	476	goals in work/career
Civics/community	482	"er" civics
	484	helps community
	486	world goals
	488	civil unrest/distrust
Religion	492	"er" religion
	493	firm religious beliefs
	494	go to church
	498	don't act Christian
Risky behavior	511	risky
	512	"er" risky behavior
	514	into trouble
	516	future risky behavior
	518	don't get into trouble
Ambiguous	600	ambiguous

Appendix E

Sample Descriptive Case Grid

First grid:

```
111 112 113 114     121 122 123 124 125 126 127
131 132 133 134 135     141 142 143 144     151 152 153     161 162
212 213 214     222 223 224     232 233 234 235     242 243 244     252 253 254     262 263 264 265
311 312 313 314 315     321 322 323 324 325     331 332 333 334     341 342 343 344     351 352 353 354     361 362 363 364 365
400 401 402     411 412 413 414 415 416 417 418     422 423 424 426 427 428     431 432 433 434 435 436 438     441 442 443 444 445 446
451 453 454 455 456     462 463 464 465 466 468     472 474 476     482 484 486 488     491 492 493 494 498     511 512 514 516 518     600
```

Second grid:

```
111 112 113 114     121 122 123 124 125 126 127
131 132 133 134 135     141 142 143 144     151 152 153     161 162
212 213 214     222 223 224     232 233 234 235     242 243 244     252 253 254     262 263 264 265
311 312 313 314 315     321 322 323 324 325     331 332 333 334     341 342 343 344     351 352 353 354     361 362 363 364 365
400 401 402     411 412 413 414 415 416 417 418     422 423 424 426 427 428     431 432 433 434 435 436 438     441 442 443 444 445 446
451 453 454 455 456     462 463 464 465 466 468     472 474 476     482 484 486 488     491 492 493 494 498     511 512 514 516 518     600
```

Appendix F

Sample Case by Category Matrix

	111	112	113	114	121	122	123	124	125	126	127	131	132	133
3001								1.0						
3002			1.1											1.1
3003								2.0						
3004								1.0						
3005														
3006														
3007													1.0	3.3
3008			1.0							2.2				
3009			1.0		1.0	2.0		2.2		1.0	2.0			
3010														
3011													1.0	
3012												1.0		
3013			1.0			6.6		18.7					1.0	1.0
3014														
3015								2.2		1.1				

Appendix G

Sample Case by Variable Matrix

ID	AVDYDU8	AVDYDU9	ACTIVITY	RACE	GENDER	c8_123	s8_123	c9_123	s9_123
3159	80.89	90.50	stable high	white	girl	.	.	1	.
3019	.79	5.98	stable low	white	boy	.	.	1	1
3129	47.57	56.45	stable low	white	girl	.	.	1	.
3130	23.71	42.00	stable low	white	girl	1	.	.	.
3158	48.00	48.60	stable low	white	girl	1	.	.	.
3095	79.19	34.17	unstable	white	girl	1	1	1	.
6	6	6	6	6	6	3	1	4	1

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