THE ROLE OF EXECUTIVE FUNCTIONING AND BORDERLINE PERSONALITY DISORDER SYMPTOMATOLOGY IN THE RELATIONSHIP BETWEEN IDENTITY FORMATION AND INTERPERSONAL FUNCTIONING

A Dissertation
Submitted to
the Temple University Graduate Board

In Partial Fulfillment
of the Requirements for the Degree
DOCTOR OF PHILOSOPHY

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May 2017

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ABSTRACT

Identity formation is the core developmental task of adolescence, although not all adolescents face this task in the same way. Adolescents with an informational identity style tend to actively seek out self-relevant information, adolescents with a normative identity style tend to passively adopt values from significant others, and those with a diffuse-avoidant identity style postpone identity formation. Research suggests these identity styles differ with respect to interpersonal functioning, with the informational – and to a lesser extent normative – identity style associated with increased psychological well-being and diffuse-avoidant identity style associated with psychological maladjustment (e.g., Borderline Personality Disorder [BPD]). However, there have been no investigations into potential moderators of the relation between identity style and interpersonal problems. The current study examined how interpersonal functioning, executive functioning, and BPD symptomatology varied as a function of identity style as well as the roles of (a) executive functioning, both basic executive functions (e.g., attention, memory) and fluid intelligence (abstract reasoning, problem-solving, planning) and (b) BPD symptomatology in moderating the relation between identity style and interpersonal functioning. The study was completed in two phases. Participants in Phase I (N = 1936) completed self-report measures of the aforementioned constructs. A sub-sample of participants (n = 71) with high or low BPD symptomatology also completed neurocognitive assessments of fluid intelligence and basic executive functions (Phase II). Results indicated identity style groups differed on interpersonal functioning, BPD symptomatology, and basic executive functioning but not fluid intelligence. The high and low BPD symptom groups also differed on interpersonal functioning but not fluid

intelligence. Results also indicate a diffuse-avoidant identity style (vs. informational or normative) predicted greater interpersonal problems. Additionally, basic executive functioning moderated this relationship such that it was strengthened for the informational identity style at low (vs. diffuse-avoidant or normative) and average (vs. diffuse-avoidant) basic executive functioning ability. BPD symptomatology also moderated this relationship such that it was strengthened for normative identity style (vs. diffuse-avoidant) at low and average BPD symptomatology. Fluid intelligence did not moderate this relationship. The current study provides further evidence for the differential relationship between the identity styles and interpersonal functioning and suggests that BPD symptomatology and basic executive functioning, but not fluid intelligence, moderates this relationship. Treatment considerations and directions for future research are also discussed.

ACKNOWLEDGEMENTS

First and foremost, I wish to express my gratitude to Dr. Mike McCloskey for his patience and guidance on this project and throughout the past seven years. I would also like to thank Dr. Deb Drabick and Dr. Tania Giovannetti for their input and support on this dissertation project and Dr. Tom Olino for his assistance during the home stretch.

The success of this project is due in no small part to the efforts of my MAD Lab mates Dan, Karla, Lauren B., Brooke, Lauren U., Alex, Dawn, Christina, Anne, Ryan, and the numerous undergraduate research assistants. I am particularly indebted to Brooke Ammerman and Anne Knorr for their continued contribution to my data collection after I moved to Minneapolis. I would also like to single out Dan Kulper, my "work husband," for his unquestioning support, ability to find humor in any situation, and amazing whiteboard drawings.

Last, but certainty not least, I would like to thank my family and friends for their love and encouragement throughout this project and graduate school as a whole. I literally could not have done it without their constant and unwavering support. Thank you.

TABLE OF CONTENTS

Page

LIST OF TABLES

Table Page

LIST OF FIGURES

Figure Page

CHAPTER 1

MANUSCRIPT IN JOURNAL ARTICLE FORMAT

The Role of Executive Functioning and Borderline Personality Disorder Symptomatology in the Relationship between Identity Formation and Interpersonal Functioning

Identity formation is a developmental process in which an individual synthesizes and integrates childhood experiences and memories, family history, present-awareness and acceptance, and future goals or ideals. As such, identity can refer to an individual's personal goals and beliefs, role relative to others, and/or identification with groups and social categories (Sedikides & Gregg, 2008). Healthy identity formation is associated with increased psychological well-being and satisfaction with relationships (Berzonsky, 2003), whereas atypical identity formation is associated with psychopathology (e.g., borderline personality disorder [BPD]) and difficulty with interpersonal relationships (Wilkinson-Ryan & Westen, 2000).

Theories of identity formation have been largely influenced by Erikson (1950, 1968), who suggested that identity formation occurs throughout one's life but has adolescence as its critical period. This is supported by studies showing that the greatest gains in identity formation appear during late adolescence (Kroger, Martinussen, & Marcia, 2010; Waterman, 1982); these gains are potentially due to the college environment, which provides a diversity of novel experiences that can serve to both trigger consideration of identity issues and to suggest alternative resolutions for identity concerns (Berzonsky & Adams, 1999).

A current conceptualization of identity formation is the identity style model, which classifies individuals by the social-cognitive strategies they use to make decisions

and process self-relevant information. Specifically, this model proposes three approaches or "styles" of dealing with identity crisis: (1) informational (an open, informed approach utilizing formal-reasoning strategies); (2) normative (an inflexible, closed approach that relies on conformity); and (3) diffuse-avoidant (an avoiding or delayed orientation) (Berzonsky, 1989). According to the model, identity formation is a lifelong process in which an individual processes, structures, and revises self-relevant information. An individual may transition between the identity styles (e.g., move from a diffuse-avoidant identity style to an informational style) or use the same social-cognitive identity processing style throughout the lifetime.

Supporting this theory, identity styles are associated with varying levels of psychological and psychosocial adjustment, with the most cohesive and mature identity style (informational) associated with more successful and problem-focused coping, greater openness to experience, more prosocial behavior, greater emotional intelligence, and more psychological hardiness as compared to the less mature normative and diffuse-avoidant identity styles (Berzonsky, 2003; Nurmi, Berzonsky, Tammi & Kinney, 1997; Seaton & Beaumont, 2008; Smits, Douman, Luyckx, Duriez & Goossens, 2011). Normative identity style, perhaps due the inflexible approach to identity formation that relies on conformity, has been linked to a mixed pattern of adjustment that includes positive coping strategies (Beaumont, 2011) as well as self-rumination (Berzonsky & Luyckx, 2008). By contrast, diffuse-avoidant identity style, considered the least mature identity style due to the avoidance in processing identity-relevant stimuli, is associated with maladaptive interpersonal behaviors (Smits et al., 2011), less satisfying peer relationships, and lower academic achievement (Nurmi et al., 1997). Taken together, data

suggest the informational, and to a lesser extent normative, identity style is associated with increased interpersonal functioning.

Despite reported differences between the identity styles on interpersonal functioning, there have been no investigations into potential moderators of this relationship. For example, executive functioning, a collection of complex cognitive processes that enable goal-directed behavior and effective problem solving (Stuss & Alexander, 2000; Zelazo, Carter, Reznick, & Frye, 1997), may play a moderating role. Early conceptualizations of identity formation (e.g., Erikson, 1950; Marcia, 1966) emphasized its temporal relationship with the development of higher-order cognitive processes (i.e., executive functioning) (Piaget, 1963); both developmental processes coincide with the continued development of the prefrontal association cortex and its subcortical white matter networks throughout adolescence (i.e., the teen years through early 20's) (Blakemore & Choudhury, 2006; Budson & Kowall, 2011). Thus, as adolescents become more capable of performing executive functions, they become better able to engage in the exploration and commitment that is required for identity formation (Erikson, 1980; Steinberg, 2005). This suggests interpersonal functioning may be particularly difficult for individuals with a less mature identity style in the context of poorer executive functioning ability, making the combination of immature identity formation and poorer executive functioning a particularly detrimental correlate of interpersonal functioning. One possible reason executive functioning has not yet been examined as a potential moderator, however, is the heterogeneity of the construct, which encompasses a variety of both basic (e.g., attention, memory) and higher order (e.g.,

abstract reasoning, problem solving) cognitive functions (Diamond, 2013; Miyake et al., 2000).

The prevailing model of executive functioning suggests that inhibition (ability to control attention, behavior, thoughts, and/or emotions), working memory (ability to hold and manipulate information in the mind), and set shifting (task switching, cognitive flexibility) are interrelated basic cognitive functions that serve as essential building blocks for more complex, higher-order cognitive processes collectively known as fluid intelligence, which consists of abstract reasoning (identifying conceptual relationships between seemingly dissimilar concepts), problem-solving (identifying and implementing steps to solve problematic situations), and planning (identifying and sequencing the actions necessary to obtain a desired goal) (Collins & Koechlin, 2012; Diamond, 2013; Lehto, Juujärvi, Kooistra, & Pulkkinen, 2003; Lunt et al., 2012; Miyake et al., 2000). Thus, executive functions can be discriminated hierarchically as either *basic executive functioning* or *fluid intelligence*.

Due to its complexity, executive functioning is often evaluated using neurocognitive tasks that assess an individual's performance on novel tasks, which allows for greater ecological validity as compared to self-reported abilities of these constructs (Chan, Shum, Toulopoulou, & Chen, 2008; Chaytor & Schmitter-Edgecombe, 2003). However, deficits in basic executive functioning can also be reliably evaluated using self-reported performance in real world situations, whereas well-validated self-report measures of fluid intelligence do not exist (Chan et al., 2008; Diamond, 2013). Research using both neurocognitive tasks and self-reported real-world performance suggests that better basic executive functioning and fluid intelligence functioning are hypothesized to

be helpful in synthesizing environmental information with internal processes to form an organized identity (Hacker, 1994; Klaczynski, Fauth, & Swanger, 1998; Sebastian, Burnett, & Blakemore, 2008).

In addition to being associated with identity formation, basic executive functioning and fluid intelligence are both associated with interpersonal difficulties. Individuals with basic executive functioning deficits show impaired social skills (Wood, 2005), poorer physical health (Crescioni et al., 2011), less school readiness and success (Morrison, Ponitz, & McClelland, 2010), less marital harmony (Eakin et al., 2004), and rejection by others (Elass & Kinsella, 1987). Similarly, fluid intelligence deficits have been linked to poorer quality of life (Brown & Landgraf, 2010), difficulty with social relations, and poor academic functioning in childhood (McDermott et al., 2013). Despite the associations between both basic executive functioning and fluid intelligence with interpersonal functioning, these constructs have not yet been examined as potential moderators of the identity - interpersonal functioning relationship.

It is unlikely, however, that executive functioning is the sole moderator of a relationship as complex as the one between identity formation and interpersonal functioning and other factors, such as relevant psychopathology, should be considered. Research indicates less mature identity formation is associated with a variety of psychological conditions, including depressive disorders (Nurmi et al., 1997), substance use disorders (White, 2000), eating disorders (Wheeler, Adams, & Keating, 2001), conduct disorder (Adams et al., 2001), and BPD (Modestin, Oberson, & Erni, 1998). Among these, however, BPD is the only disorder to include both identity disturbance (i.e., sudden and dramatic changes in self-concept, goals, and personal values) and

interpersonal instability as a part of the criteria (American Psychiatric Association [APA], 2013), suggesting it may be of particular importance in the identity style – interpersonal functioning relationship. Identity disturbance is endorsed by 26%-32% of individuals diagnosed with BPD (Grilo et al., 2001; Grilo, Becker, Anez, & McGlashan, 2004; Stanley & Siever, 2010) and its presence is indicative of a more severe, treatment-resistant presentation of BPD (Hull, Clarkin, & Kakuma, 1993; Jones & Hartmann, 1988; Yen, Johnson, Costello, & Simpson, 2009; Zanarini, Frankenburg, Hennen, & Silk, 2003) and greater interpersonal instability (Breen, Lewis, & Sutherland, 2013; Johansen, Karterud, Pedersen, Gude, & Falkum, 2004). Taken together, this suggests interpersonal functioning may be especially difficult for individuals who report a less mature identity style in the context of high BPD symptomatology, making the combination of immature identity formation and a high number of BPD symptoms an unfavorable correlate of interpersonal functioning.

To address these gaps in the literature, the current study examined the relationship between identity style and interpersonal functioning as well as the roles of executive functioning and BPD symptomatology in moderating this relationship. To do this, a large sample of late adolescent undergraduate student participants completed self-report measures of the above constructs (Phase I). A sub-sample of participants with high or low BPD symptoms also completed neurocognitive assessments of fluid intelligence (Phase II). We hypothesized that a diffuse-avoidant identity style would be associated with poorer interpersonal functioning, poorer executive functioning (both basic and fluid intelligence), and increased BPD symptoms. We also hypothesized poorer fluid intelligence and interpersonal functioning in the high BPD symptom group as compared

to the low BPD symptom group. With respect to moderation, we hypothesized that basic executive functioning (Phase I) / fluid intelligence (Phase II) would moderate the relationship between identity style and interpersonal functioning such that as basic executive functioning / fluid intelligence decreases, maturity group differences on interpersonal functioning (with diffuse–avoidant having more interpersonal problems) would be exacerbated. We also hypothesized that number of BPD symptoms would moderate the identity style - interpersonal functioning relationship such that as BPD symptomatology increases, maturity group differences on interpersonal functioning (with diffuse–avoidant having more interpersonal problems) would increase. Exploratory analyses examined the three-way interaction between identity style, number of BPD symptoms, and executive functioning on interpersonal problems.

Method

Participants

The current study consisted of two phases. Participants in Phase I included 1,936 undergraduate students (70.1% female) recruited from a large urban university who completed self-report measures of borderline personality disorder symptoms, identity style, executive functioning, and interpersonal functioning as part of a larger, IRB-approved online survey of general psychopathology and personality traits. Participants were offered research credit for their participation. Participants in Phase I ranged from ages 18 to 25 (M = 20.02, SD = 1.67) and identified as Caucasian (59.1%), Asian (14.2%), African-American (13.7%), multi-racial (6.6%), other race (5.2%), or preferred not to answer (1.3%), and predominantly identified as not Hispanic or Latino (94.0%). Participants were excluded from Phase I if they (a) did not complete all questionnaires,

(b) were under age 18 or over age 25, or (c) reported current severe major depression as indicated by a score of 16 or higher on the Quick Inventory of Depressive Symptomatology. Informed consent was obtained for all participants.

Participants in Phase II included 80 (78.8% female) undergraduate students who completed Phase I of the study and self-identified as being either high in BPD symptoms (n = 39; 82.1% female) or low in BPD symptoms (n = 41; 75.6% female) on the McLean Screening Instrument for BPD (see below). Participants were offered research credit or $10/hour (up to $30) for their participation. Participants in Phase II ranged from ages 18 to 25 (M = 20.11, SD = 1.39) and identified as Caucasian (51.3%), Asian (18.8%), African-American (18.8%), multi-racial (5.0%), or other race (6.4%), and predominantly identified as not Hispanic or Latino (93.3%). Additional exclusion criteria for participants in Phase II included a lifetime psychotic disorder, current (past month) substance dependence or current major depressive disorder (as assessed by clinical interview: see below), or past month psychotropic medication use. Informed consent was obtained for all participants.

Measures

Questionnaires.

***Identity formation*.** The Identity Style Inventory (ISI; Berzonsky, 1992) is a self-report measure consisting of 40 items that comprise four scales: informational identity style (11 items), normative identity style (9 items), and diffuse-avoidant identity style (10 items), as well as identity-related commitment (10 items). Respondents rate each item based on a 5-point Likert-type scale from 1 (uncharacteristic) to 5 (characteristic). Sample items from the identity style subscales include: “When I have a personal problem,

I try to analyze the situation in order to understand it" (informational), "I've more-or-less always operated according to the values with which I was brought up" (normative), and "I'm not really thinking about my future now; it's still a long way off" (diffuse-avoidant). For the current study, identity style was used as an index of identity formation. Consistent with previous research using the ISI (e.g., Berzonsky & Sullivan, 1992; Phillips, 2008), participants were assigned to a particular identity style based on which of their identity style subscales had the highest z-score relative to the other identity styles. The current sample showed high internal consistency for the identity style subscales: informational (α = 0.84); normative (α = 0.74); and diffuse-avoidant (α = 0.80).

***Executive functioning*.** The Dysexecutive Questionnaire (DEX-S; Wilson, Evans, Alderman, Burgess & Emslie, 1996) is a self-report measure consisting of 20 items that assess difficulties with everyday life executive function. Respondents rate the frequency of dysexecutive behaviors in four categories: inhibition, intention, social regulation, and abstract problem solving (Mooney, Walmsley, & McFarland, 2006). Items are rated on a 5-point Likert scale from 0 (never) to 4 (very often) and a sample item includes: "I have difficulties in planning for the future." Higher scores indicate a higher frequency of dysexecutive behavior in everyday life (i.e, poorer executive functioning). Consistent with previous research (e.g., Emmanousel, Mouza, Kessels & Fasitti, 2014), the current study used total score of dysexecutive behavior as a measure of basic executive functioning. In the current sample, the internal consistency for the total DEX-S was high (α = 0.94).

***Interpersonal functioning*.** The Inventory of Interpersonal Problems-32 (IIP-32; Barkham, Hardy, & Startup, 1996) is a 32-item self-report questionnaire designed to

index the difficulties adults typically experience in their interpersonal relationships. The measure contains items that are equally divided to reflect interpersonal skills that people may find too hard to do (e.g., join in on a group) or responses that they do "too much" (e.g., get irritated). Items are scored on a 5-point Likert scale from 0 (not at all) to 4 (extremely). Factor analytic evidence suggests that the IIP-32 forms eight 4-item subscales: Hard to be Sociable, Hard to be Assertive, Hard to be Supportive, Hard to be Involved, Too Aggressive, Too Open, Too Caring, and Too Dependent (Barkham et al., 1996). Higher scores indicate higher levels of interpersonal problems. The current study used total score as a measure of interpersonal functioning. In the current sample, the internal consistency for the total IIP was high ($\alpha = 0.93$).

***Borderline personality disorder symptomatology*.** The McLean Screening Instrument for Borderline Personality Disorder (MSI-BPD; Zanarini et al., 2003) is a 10-item self-report measure in which individuals are asked to answer "yes" or "no" to questions that target specific symptoms of BPD (e.g., "Have you chronically felt empty?"). Compared with a validated structured interview, both sensitivity and specificity of the MSI-BPD were above .90 in a sample of young adults (Zanarini et al., 2003). In the current study, total MSI-BPD score was used as an index of BPD symptomatology; it showed good internal consistency in our sample ($\alpha = 0.81$). For Phase II, individuals who scored seven or higher on the MSI-BPD were considered to be high in BPD symptoms and individuals who scored one or lower on the MSI-BPD were considered to be low in BPD symptoms. This approach to classifying individuals as high in BPD symptomatology is consistent with previous research showing a cut-off score of

seven or higher on the MSI-BPD yields the best sensitivity (.81) and specificity (.85) for a BPD diagnosis (Zanarini et al., 2003).

Depressive symptomatology. The Quick Inventory of Depressive Symptomatology-16 (QIDS-16; Rush et al., 2003) is a 16 item self-report measure that assesses the nine symptom domains (sleep, sad mood, appetite/weight, concentration/decision making, self-view, thoughts of death or suicide, general interest, energy level, and restlessness/agitation) that define a major depressive episode (APA, 2013). Each domain is scored from 0 to 3 reflecting increasing amounts of pathology, so the total test score can range from 0 to 27, with scores of 5 or lower indicative of no depression, scores from 6 to 10 indicating mild depression, 11 to 15 indicating moderate depression, 16 to 20 reflecting severe depression, and total scores greater than 21 indicating very severe depression (Rush, 2003). The QIDS-16 has good reliability and construct validity (Trivedi et al., 2004) and showed acceptable internal consistency in the current sample ($\alpha = 0.73$). Participants were excluded from the current study if they scored in the severe depression range (16 or higher) on the QIDS-16.

Clinical interviews.

Psychopathology. The Structured Clinical Interview for DSM–IV-TR (SCID-IV-TR; First, Gibbon, Spitzer, & Williams, 1996) is a semi-structured clinical interview used to assign diagnoses for mood disorders, psychotic disorders, substance abuse and dependence, anxiety disorders, somatoform disorders, eating disorders, and adjustment disorders. The SCID has adequate inter-rater reliability with kappa values for modules reported to be between .70 and 1.00 (First et al., 1996).

The Structured Interview for DSM-IV-TR Personality (SID-P; Pfohl, Blum, & Zimmerman, 1995) is used to diagnose DSM-IV-TR personality disorders. Estimates of interrater reliability for the SID-P are adequate to strong with intraclass correlation coefficients (ICC) as high as .88–.99 (Damen, De Jong, & Van der Kroft, 2004).

Neurocognitive assessments.

***Planning*.** A computerized version (Berg & Byrd, 2002) of the classic Tower of London (TOL; Shallice, 1982) task was administered to assess planning. Similar to the physical instrument used in the classic TOL, on all trials on the computerized TOL the participant was shown (a) a goal instrument and (b) a game instrument, each of which displays three differently colored balls distributed across the three rods able to hold one, two, or three balls. The participant was asked to move the balls on the game instrument from their starting arrangement to match the goal in as few moves as necessary, using the computer cursor to ‘‘drag’’ and ‘‘drop’’ each ball. The participant was instructed to click a button indicating completion of the trial when the solution picture matches the goal picture. After each trial, feedback was presented indicating whether the trial was solved in the minimum number of moves, solved with extra moves, or incorrectly solved. Participants completed five sets of four trials (20 trials total), beginning with those that can be solved in three moves and progressing to those that require a minimum of seven moves. The current study used the length of time that a participant waited before initiating a solution for a given problem (first-move latency) as the outcome measure for this task. Research indicates that first-move latency significantly predicts overall performance on the TOL and is commonly interpreted as a measure of the extent to

which an individual plans before acting (Albert & Steinberg, 201; Mitchell & Poston, 2001).

Problem-solving. Matrix reasoning (MR) is one of four subtests of the Wechsler Abbreviated Scale of Intelligence – Second Edition (Wechsler, 2011). During this task, the participant was presented 30 incomplete matrices, one at a time, from a spiral-bound stimulus book. Participants were instructed to point to or verbally state which of the five presented options would complete the matrix. The participant's answers were recorded onto a computer version of the standard record form. Right/wrong feedback was never provided on the test, so possible adverse effects of repetitive negative feedback were minimized. MR is suggested to be a measure of nonverbal abstract problem solving, inductive reasoning, and spatial reasoning. The current study used number of correct responses as a measure of problem-solving.

Abstract reasoning. The Sorting Test (DKEFS-ST) is one of nine subtests of the Delis–Kaplan Executive Function System (Delis, Kaplan, & Kramer, 2001). It is widely considered to be a reliable and valid assessment of the executive functioning facet of abstract reasoning (see Delis, Kramer, Kaplan, & Holdnack, 2004, for a review). In the current study, participants completed the standard form, which consisted of two tasks: free sorting and sort recognition. During free sorting, the participant was presented with six mixed-up cards that displayed both perceptual features and printed words. The participant was asked to sort the cards into two groups (categorization), with three cards per group (description), according to as many different concepts or rules as possible, and to describe the concepts employed to generate each sort. Each of the two card sets has a maximum of eight target sorts: three sorts based on verbal-semantic information from the

printed words and five based on visual-spatial features or patterns on the cards. During sort recognition, the examiner sorts the same sets of cards into two groups, with three cards per group, according to the eight target sorts. After each sort is made by the examiner, the participant attempts to identify and describe the correct rules or concepts used to generate the sort. The participant has at maximum 45 seconds (for each grouped cards) to verbalize the reason why the cards have been sorted in that way. Right/wrong feedback was never provided on the test, so possible adverse effects of repetitive negative feedback were minimized. The free sorting description score, which is based on how well the participant describes the sorting principle, was used in the current study as a measure of abstract reasoning ability.

Fluid Intelligence composite score. The composite score of fluid intelligence was calculated for participants who completed all three neurocognitive tasks in Phase II. Fluid intelligence scores were obtained by summing z-scores derived from TOL first-move latency, MR number of correct responses (raw score), and DKEFS-ST free sorting description score (raw score). Raw scores instead of the age-adjusted scaled scores were used to calculate z-scores for the MR and DKEFS-ST tasks for consistency with the TOL task, which does not take age into account during scoring.

Procedure

All participants were recruited from Temple University's SONA System, a system that provides research opportunities to undergraduate students in return for research credits that are often required for their psychology courses. During Phase I, participants completed the ISI, DEX-S, IIP, QIDS-16, and MSI-BPD questionnaires as part of a larger, IRB-approved survey of general psychopathology and personality traits.

Participants provided informed consent and received course credit for their participation. Participants identified as eligible for Phase II were contacted via phone and/or email to provide more information about Phase II including that they would need to pass a urine drug screen to participate in this part of the study. Participants who expressed interest in the study were scheduled to come into the laboratory.

Upon entering the lab, participants read an informed consent, demonstrated understanding, and signed the form. Participants then provided a urine sample for drug testing. Positive results were discussed with the subject and followed with either immediate retesting, rescheduling of their visit, or dismissal (n = 3) from the study. Participants who passed the drug screen completed a clinical interview consisting of the SCID and SID-P to assess for current and past psychopathology. All clinical interviews were conducted by master's level clinicians who were trained to conduct such interviews and supervised by a licensed clinical psychologist. After the interview, participants completed a battery of three neurocognitive assessments administered according to standardized instructions: TOL, DKEFS-ST, and MR, counterbalanced to control for order-effects bias. At the end of the visit, participants were compensated either $10 per hour (up to $30) or three research credits for their time.

Data Analytic Plan

Preliminary Analyses. The critical alpha for all analyses was .05. All variables were examined for skew statistics and outliers to establish that all assumptions for parametric tests were met. Descriptive statistics were conducted to investigate demographic variables (age, race, gender) within the sample and a series of univariate ANOVAs, *t*-tests, and chi-squared analyses were conducted to investigate their relation to

the independent (identity style) and dependent (IIP) variables. Significant group differences were probed using Tukey's HSD tests (for ANOVAs) and single degree of freedom chi-squared analyses. Demographic variables associated with the independent (identity style) or dependent (IIP) variables were entered into subsequent hierarchical regression analyses as covariates. Pearson's correlations were used to examine the relationships among DEX-S, IIP, MSI-BPD (Phase I) and fluid intelligence (Phase II). All analyses were conducted using SPSS Version 24.

Phase I. Identity group differences on measures of interpersonal functioning (IIP), BPD symptoms (MSI-BPD), and basic executive functioning / dysexecutive functioning (DEX-S) were assessed using univariate ANOVAs and post-hoc Tukey's HSD tests. Hierarchical multiple regressions were then conducted to examine (a) dysexecutive functioning and (b) number of BPD symptoms as moderators of the identity style – interpersonal problems relationship. Due to the categorical nature of identity style, the variable was dummy coded using diffuse-avoidant identity style as the reference group for one analysis and normative identity style as the reference group for the parallel analysis. To reduce multicollinearity, the DEX-S and MSI-BPD were mean-centered prior to inclusion in the regression equations and interaction terms were created from the mean-centered variables. For both regression equations, interpersonal functioning was the dependent variable and predictor variables were entered in the following steps: 1) covariates [age, race, and gender]; 2) main effects of identity style (dummy coded as noted above), DEX-S, and MSI-BPD; and 3) all two-way interactions (i.e., DEX-S x MSI-BPD, identity style [dummy coded] x DEX-S, identity style [dummy coded] x MSI-BPD). Significant interactions were examined using the PROCESS SPSS macro (Hayes,

2013) to view the effects of identity style on interpersonal problems at low (-1 SD), average (0 SD), and high (+1 SD) levels of (a) dysexecutive functioning and (b) number of BPD symptoms.

Phase II. An ANOVA assessed identity group differences on a composite score of fluid intelligence. A t-test examined differences between BPD symptom status (high vs. low) on fluid intelligence and interpersonal problems. Hierarchical multiple regressions were then conducted to examine fluid intelligence as a moderator of the relationship between identity style and interpersonal functioning. Similar to Phase I analyses, the continuous variable of fluid intelligence was mean centered and the categorical variable of identity style was dummy coded using diffuse-avoidant identity style as the reference group for one analysis and normative identity style as the reference group for the parallel analysis. For both regression equations, interpersonal functioning was the dependent variable and predictor variables were entered in the following steps: 1) covariate [gender], 2) main effects of identity style (dummy coded) and fluid intelligence, and 3) the identity style (dummy coded) x fluid intelligence interaction.

Exploratory Analyses. See "Additional (Exploratory) Results" section**.**

Results

Phase I

Preliminary Analyses. An analysis of skew indicated that variables were not skewed (skew statistics = 0.24 to 0.55). Preliminary analyses of identity style determined that more participants identified as having a diffuse-avoidant identity style (46.8%), than normative (27.3%), or informational (25.9%). The identity styles differed on demographic variables (i.e., age, gender, race) (see Table 1). With respect to age,

Table 1.

*Demographic information and psychosocial functioning of participants in Phase I by identity style (*N = *1936)*

	Informational (*n* = 501)	Normative (*n* = 528)	Diffuse-Avoidant (*n* = 907)	F/X^2 value	η^2/V value
Demographic Information					
Age *M (SD)* [b,c]	20.26 (1.78)	19.74 (1.54)	20.06 (1.64)	13.19**	.01
Female *n* (%)[b,c]	349 (70)	414 (79)	594 (66)	26.99**	.12
Race *n* (%)[a,c]				37.34**	.10
AA	56 (11)	77 (15)	131 (14)		
Caucasian	332 (66)	320 (60)	489 (55)		
Asian	40 (8)	76 (14)	158 (17)		
Multiracial	39 (8)	25 (5)	63 (7)		
Other/DNS	34 (7)	30 (6)	66 (7)		
Study Variables (*M*, *SD*)					
DEX-S[a,b]	19.96 (11.72)	19.73 (14.49)	29.62 (15.55)	120.41**	.11
IIP[a,b]	1.10 (0.69)	1.07 (0.64)	1.40 (0.76)	48.58**	.05
MSI-BPD[b,c]	3.60 (2.66)	2.64 (2.42)	3.47 (3.05)	19.20**	.02

Note: **$p < .001$; [a]Diffuse-Avoidant ≠ Informational, [b]Diffuse-Avoidant ≠ Normative, [c]Informational ≠ Normative; AA = African American, DNS = Did not state race; DEX-S = Dysexecutive Questionnaire Total Score; IIP = Inventory of Interpersonal Problems Total Score; MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder Total Score

individuals who reported a normative identity style were significantly younger than those who reported a diffuse-avoidant or informational identity style, who did not differ in age. The identity style groups also differed by gender with subsequent review of 2x2 chi-squared analyses suggesting a higher proportion of females in the normative identity style group relative to both the informational and diffuse-avoidant identity styles, which did not differ in gender distribution. Additionally, the identity style groups differed on race. Post-hoc 2x2 chi-squared analyses indicted that participants in the informational identity style group were more likely to identify as Caucasian (vs. African-American or Asian) and less likely to identify as Asian (vs. all other races) relative to the diffuse-avoidant identity group. Participants in the informational identity style group were also less likely to identify as African-American (vs. Multiracial) or Asian (vs. Caucasian, Multiracial or Other/Did not state race) than those in the normative identity style group. Post-hoc analyses indicated no differences in racial distribution between the diffuse-avoidant and normative identity styles. There was no association between age (r = -0.02, p = .29), race [F(4, 1923) = 1.41, p = .23, η^2 = 0.02], or gender [t(1915) = 1.49, p = .14, d = 0.07] and interpersonal problems. Based on these findings, the demographic variables of age, gender, and race were included as covariates for Phase I regression analyses.

Pearson's product-moment correlation of study variables indicated that increased interpersonal problems were associated with increased self-reported dysexecutive functioning (r = 0.55, p < .001) as well as number of BPD symptoms (r = 0.44, p < .001). Increased dysexecutive functioning was also associated with number of BPD symptoms (r = 0.39, p < .001).

Pearson's correlations of z-scores indicated that the identity styles were correlated; that is, having an informational identity style was positively associated with the normative (r = .23, p < .001) and diffuse-avoidant (r = .28, p < .001) identity styles and the diffuse-avoidant identity style was positively associated with the normative identity style (r = .35, p < .001).

Primary Analyses. Identity style groups differed on dysexecutive functioning, BPD symptoms, and interpersonal functioning (see Table 1). Individuals identified as having a diffuse-avoidant identity style reported significantly higher dysexecutive functioning and more interpersonal problems than the normative or informational identity style groups who did not differ on these constructs. Surprisingly, individuals identified as having a normative identity style reported significantly fewer BPD symptoms than either individuals in the diffuse-avoidant or informational identity styles groups, who did not differ on number of BPD symptoms.

Hierarchical multiple regressions using diffuse-avoidant identity style as the reference group for one dummy coded analysis and normative identity style as the reference group for the parallel analysis were conduct to examine (a) dysexecutive functioning and (b) number of BPD symptoms as moderators of the identity style – interpersonal functioning relationship. After mean-centering variables included in the model, tests of multicollinearity indicated that a very low level of multicollinearity was present (VIF's between 1.01 and 2.21). As shown in Table 2, Step 1 revealed no significant effects of demographic variables (age, gender, or race) and added no significant amount of variance in interpersonal functioning to the null model (the constant-only model). Step 2, which included the main effects of identity style,

Table 2.

Summary of hierarchical regressions examining the roles of dysexecutive functioning and Borderline Personality Disorder symptomatology on the relationship between identity style and interpersonal problems (N = 1936)

	Model 1			Model 2			Model 3		
	B	SE	β	B	SE	β	B	SE	β
Controls									
Age	-.01	.01	-.02	.003	.01	.01	.003	.01	.01
Race	.01	.03	.01	.01	.03	.01	.01	.03	.01
Gender	.05	.04	.03	.06	.03	.04	.06	.03	.04
Main Effects									
I vs D				.01*	.00	.06	-.08*	.04	-.05
N vs D				-.08*	.03	-.05	-.08*	.03	-.05
I vs N				-.03	.04	-.02	-.004	.04	-.002
DEX-S				.02**	.00	.42	.02**	.001	.42
MSI-BPD				.06**	.01	.22	.06**	.01	.22
Interactions									
I vs D x DEX-S							.01*	.003	.06
N vs D x DEX-S							-.002	.003	.07
I vs N x DEX-S							.01*	.003	.08
I vs D x MSI-BPD							.01	.01	.02
N vs D x MSI-BPD							.04*	.01	.07
I vs N x MSI-BPD							-.03	.02	-.05
DEX-S x MSI-BPD							.001	.00	.03
F total		1.05			161.17**			96.25**	
Adjusted R^2		.00			.37			.38	
Δ*F*		1.05			280.80**			3.73*	
ΔR^2		.002			.37			.006	

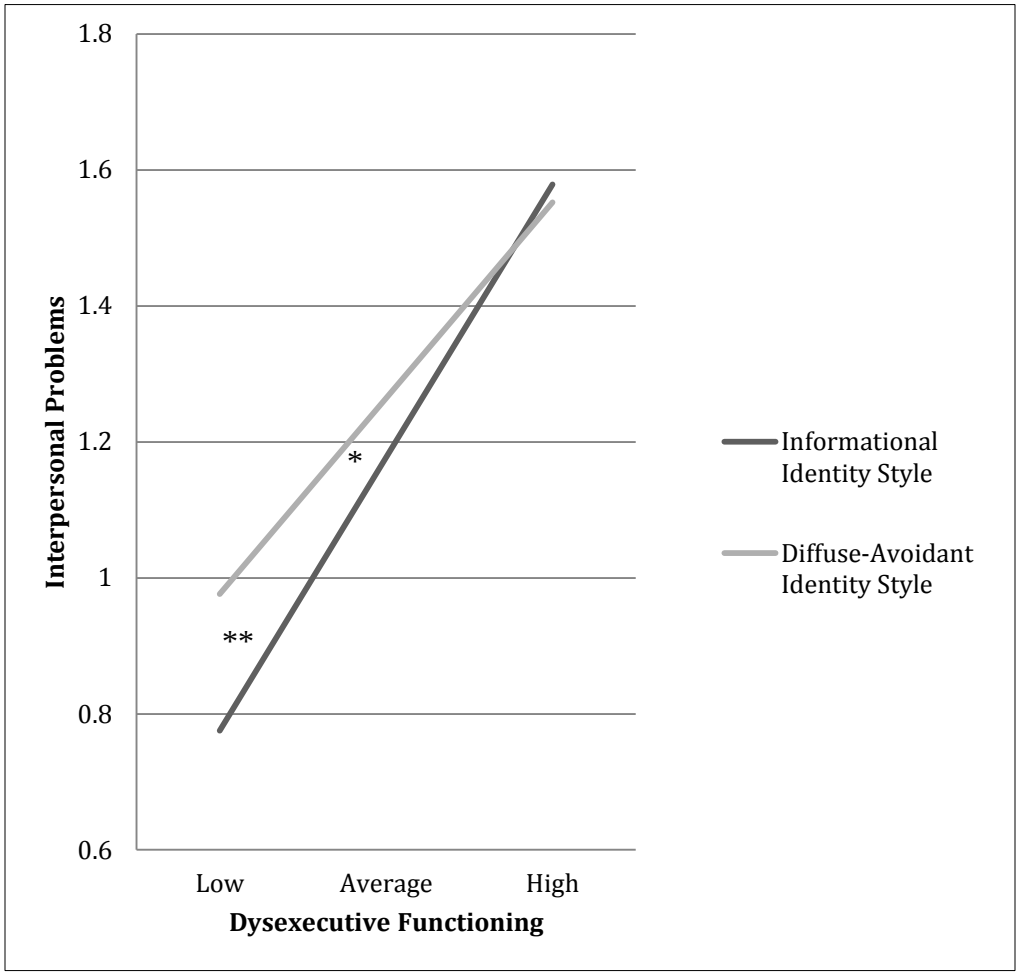
Note: **$p < .001$; *$p < .05$; I = Informational identity style; N = Normative identity style; D = Diffuse-Avoidant identity style; DEX-S = Dysexecutive Questionnaire Total Score; MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder Questionnaire Total Score

dysexecutive functioning, and number of BPD symptoms accounted for a significant amount of variance, with more BPD symptoms, higher dysexecutive functioning, and diffuse-avoidant identity style (vs. either informational or normative) predicting more interpersonal problems. Step 3 (two-way interactions) was also significant, with the interactions of informational identity style (vs. either normative or diffuse avoidant) x dysexecutive functioning and normative identity style (vs. diffuse-avoidant) x BPD symptoms predicting to interpersonal problems.

Conditional effects were examined for the significant interactions at low (-1 SD), average (0 SD), and high (+1 SD) levels of dysexecutive functioning. As shown in Figure 1, results indicated that at average to low levels of dysexecutive functioning, individuals with an informational identity style reported significantly fewer interpersonal problems than those with a diffuse-avoidant identity style (dysexecutive functioning = 0 SD [b = -.09, t(1881) = -2.54, p = .01, d = -0.12]; dysexecutive functioning = -1 SD [b = -0.20, t(1881) = -4.47, p < .001, d = -0.21]). However, at high levels of dysexecutive functioning there was no difference between informational and diffuse-avoidant identity style on interpersonal problems, b = 0.02, t(1881) = 0.45, p = .65, d = 0.02. When comparing normative to informational identity style, it was again found that at low levels of dysexecutive functioning, individuals with an informational identity style reported significantly fewer interpersonal problems than those with a normative identity style, b = -0.11, t(1881) = -2.48, p = .01, d = -0.11. However, there was no difference in interpersonal problems between groups at average levels of dysexecutive functioning, [b = .002, t(1881) = 0.06, p = .96, d = 0.003], and at high levels of dysexecutive functioning

Figure 1.

The relationship between Informational (vs. Diffuse-Avoidant) identity style and interpersonal problems as a function of (dys)executive functioning



Note: $^{**}p < .001$, $^{*}p < .05$; Interpersonal Problems = Inventory of Interpersonal Problems Total Score; Dysexecutive Functioning = Dysexecutive Questionnaire Total Score

there was a trend towards greater interpersonal problems in the informational group, b = 0.11, $t(1881) = 1.91$, $p = .06$, $d = 0.09$ (See Figure 2).

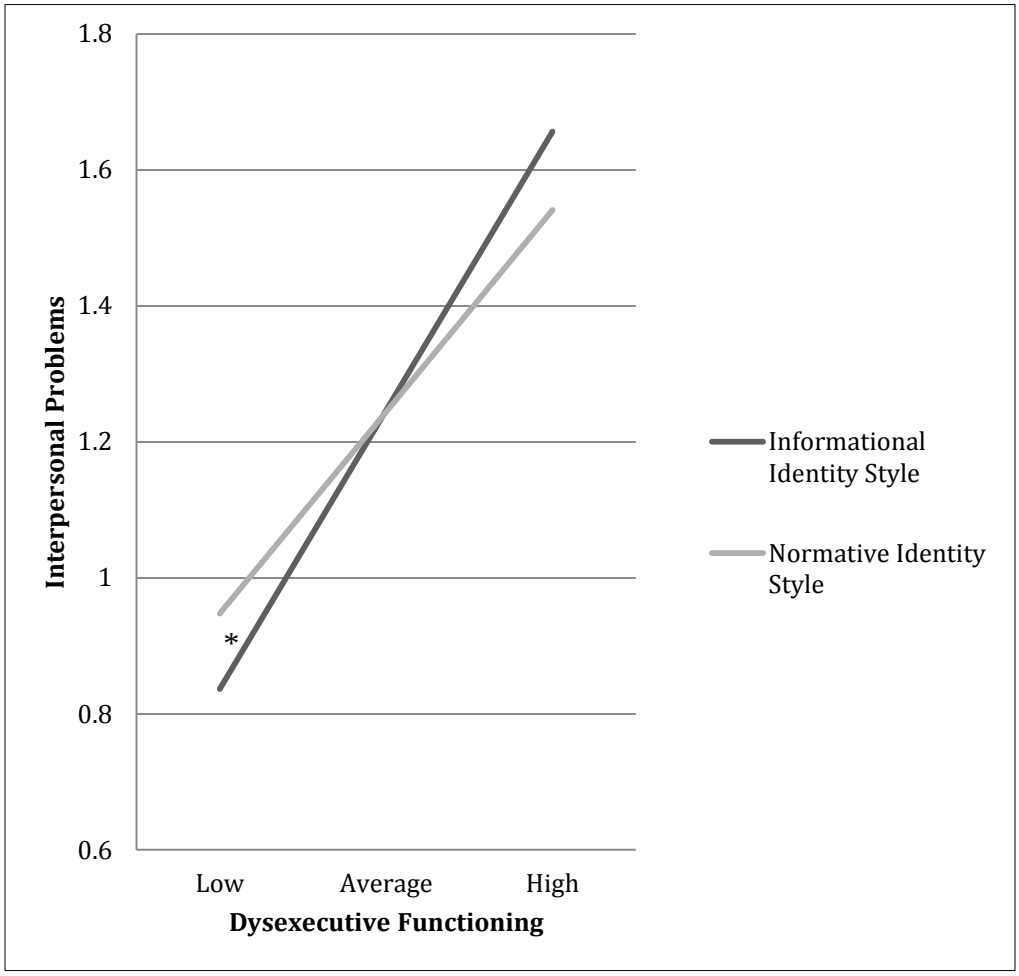
With respect to the normative identity style (vs. diffuse-avoidant) x BPD symptoms interaction, conditional effects were examined at low (-1 SD), average (0 SD), and high (+1 SD) number of BPD symptoms. Results indicated that individuals with a normative identity style reported significantly fewer interpersonal problems at a low number of BPD symptoms and marginally fewer interpersonal problems at an average number of BPD symptoms compared to individuals with a diffuse-avoidant identity style, (BPD symptoms = -1 SD [$b = -0.13$, $t(1881) = -2.94$, $p = .003$, $d = -0.14$]; BPD symptoms = 0 SD [$b = -.07$, $t(1881) = -1.96$, $p = .05$, $d = -0.09$]). At a high number of BPD symptoms, however, there was no difference between groups on interpersonal problems, $b = -0.01$, $t(1881) = -0.10$, $p = .92$, $d = -0.005$ (See Figure 3).

Phase II

Preliminary Analyses. Of the 80 participants enrolled in Phase II, five participants did not meet eligibility criteria for the neurocognitive component of the study based on their responses during the diagnostic assessment (e.g., current use of psychotropic medications, current substance dependence, current major depressive disorder). Of the 75 participants who were eligible to complete the neurocognitive portion of Phase II, 71 successfully completed all tasks; four participants (three from the high BPD group and one from the low BPD group) were unable to complete the TOL task due to computer malfunction. Thus, the following analyses include only these 71 participants who completed all tasks. Analysis of skew statistics indicated that variables were not skewed (skew statistics = -0.19 to 0.55).

Figure 2.

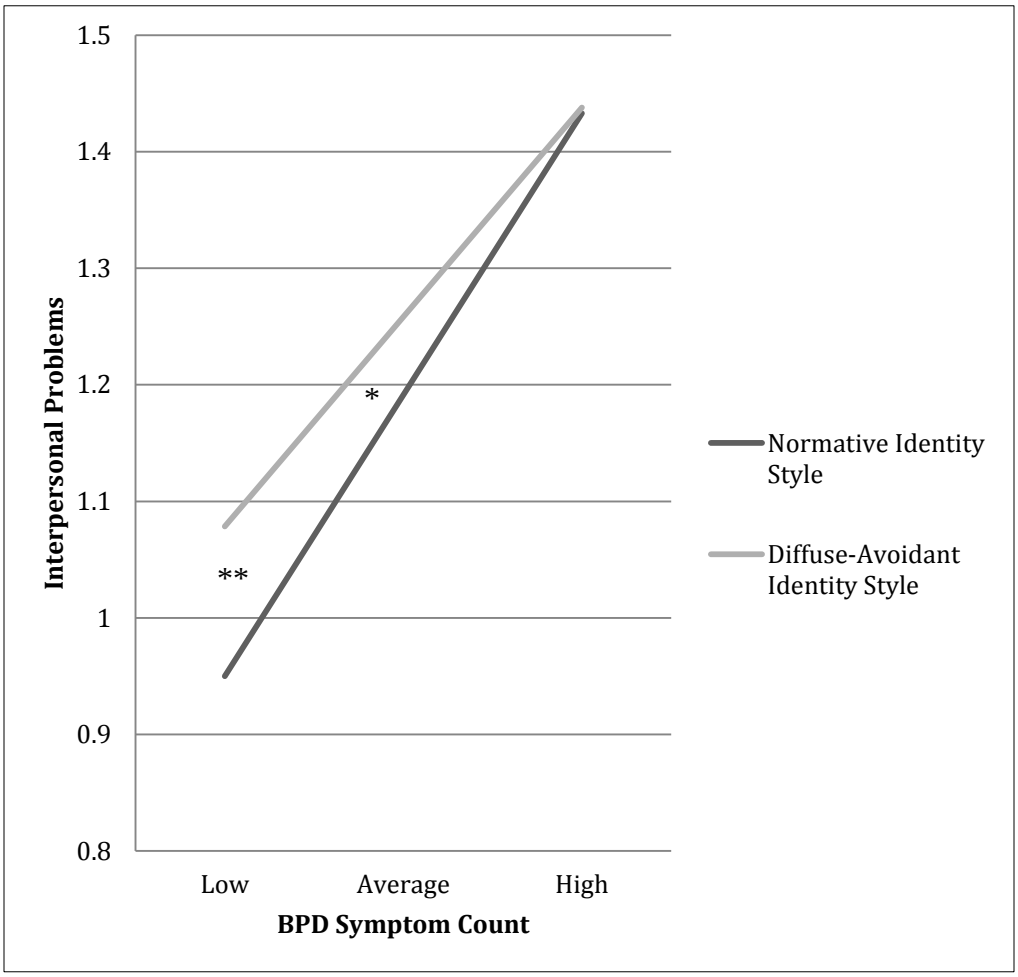
The relationship between Informational (vs. Normative) identity style and interpersonal problems as a function of (dys)executive functioning



Note: *$p < .05$; Interpersonal Problems = Inventory of Interpersonal Problems Total Score; Dysexecutive Functioning = Dysexecutive Questionnaire Total Score

Figure 3.

The relationship between Normative (vs. Diffuse-Avoidant) identity style and interpersonal problems as a function of Borderline Personality Disorder symptomatology



Note: $^{**}p < .01$, $^{*}p = .05$; Interpersonal Problems = Inventory of Interpersonal Problems Total Score; BPD Symptom Count = Number of items endorsed on the McLean Screening Instrument for Borderline Personality Disorder Questionnaire

Consistent with Phase I, more participants identified as having a diffuse-avoidant identity style (46.5%), than normative (31.0%), or informational (22.5%) and the identity styles were correlated with one another. Pearson's product moment correlation of z-scores indicated that having an informational identity style was positively associated with the normative (r = .66, p < .001) and diffuse-avoidant (r = .38, p = .002) identity styles and the diffuse-avoidant identity style was positively associated with the normative identity style (r = .34, p = .007).

With respect to demographic variables, there were no differences between individuals who were identified as having a diffuse-avoidant, normative, or informational identity style in age or race, but the groups differed with respect to gender (see Table 3). Review of follow-up 2x2 chi-squared analyses indicated a higher proportion of females classified as having a normative identity style relative to either the informational or diffuse-avoidant identity styles, which did not differ from each other. Additionally, there was no association between age (r = 0.06, p = .63), race [$F(4, 70) = 0.51$, p = .73, η^2 = 0.03], or gender ($t(69) = 0.51$, p = .61, d = 0.12) and interpersonal problems. Based on these findings, only gender was included as a covariate for Phase II regression analyses.

Additional analyses using Pearson's product-moment correlation showed no relationship between level of fluid intelligence (M = -.005, SD = 2.10) and interpersonal functioning (M = 1.21, SD = .75) across groups, r = .011, p = .93.

Primary Analysis. Identity style groups did not differ on fluid intelligence (see Table 3). Consistent with Phase I, identity style groups did differ in level of psychosocial functioning. Individuals who identified as diffuse-avoidant reported significantly more interpersonal problems than individuals in the normative identity style group, while

Table 3.

Demographic information and psychosocial functioning of participants in Phase II by identity style (N = 71)

	Informational (n = 16)	Normative (n = 22)	Diffuse-Avoidant (n = 33)	F/X^2 value	η^2/V value
Demographic Information					
Age (*M, SD*)	20.19 (1.41)	20.27 (1.08)	20.03 (1.55)	0.20	.006
Female *n* (%)[b,c]	12 (75)	21 (95)	22 (67)	6.34*	.30
Race *n* (%)				13.32	.31
AA	5 (31)	4 (18)	3 (9)		
Caucasian	8 (50)	15 (68)	13 (40)		
Asian	2 (13)	2 (9)	11 (33)		
Multiracial	1 (6)	0 (0)	3 (9)		
Other/DNS	0 (0)	1 (5)	3 (9)		
Study Variables *(M, SD)*					
FI	0.49 (2.89)	-0.27 (2.33)	-0.07 (1.42)	0.64	.02
IIP[b]	1.23 (0.75)	0.82 (0.54)	1.47 (0.76)	5.59**	.14

Note: **p < .01; *p < .05; [b]Diffuse-Avoidant ≠ Normative, [c]Informational ≠ Normative; DNS = Did not state race; AA = African American; FI = Fluid intelligence composite score (abstract reasoning, planning, problem-solving); IIP = Inventory of Interpersonal Problems Total Score

individuals in the informational group did not differ from either group (see Table 3). Additionally, participants in the high BPD symptom group reported significantly more interpersonal problems (M = 1.75, SD = 0.52) than the low BPD symptom group (M = 0.78, SD = 0.62), $t(69) = -7.11$, $p < .001$, $d = 1.71$. However, the high (M = -0.13, SD = 2.30) and low (M = 0.10, SD = 1.94) BPD symptom groups did not differ on fluid intelligence, $t(69) = 0.46$, $p = 0.64$. $d = 0.11$.

Hierarchical multiple regressions using diffuse-avoidant identity style as the reference group for one dummy coded analysis and normative identity style as the reference group for the parallel analysis were conduct to examine whether fluid intelligence ability moderates the relationship between identity style and interpersonal functioning. After mean-centering variables included in the model, tests of multicollinearity indicated that a very low level of multicollinearity was present (VIF's between 1.00 and 2.74). As shown in Table 4, Step 1 revealed no significant effect of gender and added no significant amount of variance in interpersonal functioning to the null model (the constant-only model). Step 2, which included the main effects of identity style and fluid intelligence, accounted for a significant amount of variance, with diffuse-avoidant identity style (vs. normative) predicting to more interpersonal problems. Step 3, the identity style x fluid intelligence interactions, did not account for a significant amount of additional variance in interpersonal functioning.

Discussion

Identity formation is the core developmental task of adolescence, although not all adolescents face this task in the same way (Berzonsky, 1989; Erikson, 1968).

Table 4.

Summary of hierarchical regressions examining fluid intelligence as a moderator of the relationship between identity style and interpersonal problems (N = 71)

	Model 1			Model 2			Model 3		
	B	SE	β	B	SE	β	B	SE	β
Controls									
Gender	-.11	.22	-.06	.10	.22	.06	-.02	.22	-.009
Main Effects									
I vs D				-.24	.22	-.14	-.26	.22	-.15
N vs D				-.68*	.21	-.42	-.64*	.21	-.40
I vs N				.44	.24	.24	.38	.24	.21
FI				.00	.04	-.001	-.13	.09	-.38
Interactions									
I vs D x FI							.22	.11	.39
N vs D x FI							.11	.11	.20
I vs N x FI							.10	.09	.18
F total		0.26			2.78*			2.53*	
Adjusted R^2		-.01			.09			.12	
Δ*F*		0.26			3.61*			1.88	
ΔR^2		.004			.14			.05	

Note: *$p < .05$; I = Informational identity style; N = Normative identity style; D = Diffuse-Avoidant identity style; FI = Fluid intelligence composite score (abstract reasoning, planning, problem-solving)

Adolescents with an informational identity style tend to actively seek out and evaluate self-relevant information, adolescents with a normative identity style tend to passively adopt values from significant others, and those with a diffuse-avoidant identity style postpone identity formation for as long as possible (Berzonsky, 1989). Research suggests these identity styles are associated with varying levels of psychosocial adjustment and interpersonal functioning. The current study assessed how interpersonal functioning, executive functioning, and BPD symptoms varied as a function of identity style as well as the extent to which (a) basic executive functioning (Phase I) / fluid intelligence (Phase II), and (b) BPD symptomatology moderate the relationship between identity style and interpersonal functioning. We hypothesized that a diffuse-avoidant identity style would be associated with poorer interpersonal functioning, impaired global executive functioning, and increased BPD symptomatology. We also hypothesized poorer fluid intelligence and interpersonal functioning in the high (vs low) BPD symptom group. With respect to moderation, we hypothesized that (a) decreased basic executive functioning (Phase I) / fluid intelligence (Phase II) and (b) increased BPD symptomatology would moderate the relationship between identity style and interpersonal functioning such that maturity group differences on interpersonal functioning (with diffuse–avoidant having more interpersonal problems) would be exacerbated. Overall, our findings supported our hypothesized differential relationship between identity style and interpersonal functioning and suggested that BPD symptomatology and basic executive functioning, but not fluid intelligence, may moderate this relationship.

Results from Phase I generally supported our hypotheses. Individuals identified as having a diffuse-avoidant identity style reported more interpersonal problems than the normative or informational identity style groups, who did not differ on this construct; this pattern remained after controlling for age, gender, and race. These findings extend previous research showing that individuals who endorse more mature identity styles report more effective decision making (Berzonsky & Ferrari, 1996) and active coping and planning (Beaumont, 2011) whereas individuals who endorse a diffuse-avoidant identity style report low agreeableness, conscientiousness (Dollinger, 1995) and higher psychopathology, all of which are associated with interpersonal problems (Adams et al., 2001).

As hypothesized, the diffuse-avoidant (vs. normative or informational) identity style was also associated with poorer basic executive functioning. This finding is consistent with both theoretical and empirical literature noting executive functioning as a necessary component of identity formation (e.g., Erikson, 1950; McNamara, Durso, & Brown, 2003; Rowe & Marcia, 1980). Specifically, researchers argue that adolescents need to engage in the abstract, multidimensional, and hypothetical thinking for successful identity formation (Erikson, 1980; Steinberg, 2005). Therefore, individuals who report deficits in basic executive functioning also report being more likely to avoid or delay identity formation, which is what we found. Additional studies are needed to examine the temporal relationship of basic executive functioning abilities and the social-cognitive process of identity formation.

Basic executive functioning also moderated the relationship between identity style and interpersonal problems, but not as expected. We hypothesized the relationship

between identity style (im)maturity and interpersonal problems would strengthen as basic executive functioning decreased, exacerbating interpersonal problems in the less mature diffuse-avoidant identity style compared to the informational identity style. However, results showed that identity group differences on interpersonal functioning were actually strongest when basic executive functioning was ability was high, at which point the more mature (informational) identity style was associated with fewer interpersonal problems than the diffuse-avoidant or normative identity styles. In contrast, when basic executive functioning was poor, the informational and diffuse-avoidant styles did not differ on interpersonal problems, and there was even a non-significant trend for the informational identity style to report more interpersonal problems than those with a normative identity style. Thus, stronger basic executive functioning seems to be more protective for those with an informational identity style. Although unexpected in the current study, this finding is compatible with previous studies noting a positive association between informational identity style and depressive rumination when self-regulation, a component of basic executive functioning, was statistically controlled (Berzonsky & Kuk, 2000; Dunkel, Papini, & Berzonsky, 2008). Although the directionality of this relationship is unknown, it is possible that for those with an informational identity style, processing self-relevant information may become maladaptive self-reflection in the absence of adequate self-regulatory skills (i.e., basic executive functioning) and lead to increased interpersonal difficulties. Further research should examine individual facets of basic executive functioning, including self-regulation, to further illuminate the nuances of the identity style – executive functioning relationship.

Additionally, we found support for our hypothesis that a diffuse-avoidant identity style would be associated with increased BPD symptomatology. This finding is consistent with poor identity formation (i.e., identity disturbance) as a defining feature of BPD (APA, 2013) that discriminates BPD from other psychiatric disorders (Johansen et al., 2004; Jørgensen, 2006; Widiger, Frances, Warner, & Bluhm, 1986). This also replicates findings from the one study to date that has examined this relationship and reported BPD patients more likely than a control group to endorse a diffuse-avoidant identity style (Jørgensen, 2009). In sum, the current study provides further evidence of the association between postponing the process of identity formation and BPD symptomology.

To our surprise, informational identity style was also associated with a high number of BPD symptoms. This may be partially explained by the significant positive association between the diffuse-avoidant and informational identity styles in the current sample. Although the identity styles are not intended to be independent, these two identity styles are conceptualized to be negatively related due to their opposing strategies for identity formation (Berzonsky, 1989). However, empirical examinations of this relationship have shown mixed results, including positive correlations (Dunkel, 2005; Jakubowski & Dembo, 2004), and relatively high mean scores for the informational identity style in the aforementioned BPD sample (Jørgensen, 2009). A recent meta-analytic review of the ISI also found small-to-medium negative associations between the informational and diffuse-avoidant identity styles that were moderated by country of origin such that studies conducted in the United States, which included predominantly Caucasian participants, yielded smaller effect sizes than international studies (Bosch & Card, 2012). Participants in the current sample were racially diverse and although

information regarding country of origin was not obtained, it is possible the positive correlation between the information and diffuse-avoidant identity styles in the current study is a product of the sample's diversity. Future studies should further elucidate this relationship.

With respect to BPD symptomatology as a moderator of the identity style – interpersonal problems relationship, we found that number of BPD symptoms moderated the relationship between diffuse–avoidant (vs. normative) identity style and interpersonal problems, with the diffuse-avoidant group reporting more interpersonal problems when BPD symptoms were low to moderate, but no group differences when BPD symptoms were high. Thus, rather than increased BPD symptoms exacerbating identity group differences as we expected, it appears that more severe BPD symptomatology, including impulsivity, emotional instability, and interpersonal dysfunction (Gunderson, 2009; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004), outweighs any benefits in interpersonal functioning an individual receives by exhibiting a normative identity style.

Results from Phase II were less supportive of our hypotheses. Although interpersonal functioning varied as predicted by identity style and BPD symptom status, there were no group differences on fluid intelligence. Additionally, fluid intelligence did not moderate the relationship between identity style and interpersonal problems. This finding is surprising given the expected association between the higher-order executive functions that form fluid intelligence (planning, abstract reasoning, problem-solving) and identity formation / BPD. One possible explanation is the composite measure of fluid intelligence masked significant effects of the individual facets of fluid intelligence. Subsequent analyses of the three facets, however, showed that neither planning, abstract

reasoning, nor problem-solving correlated with the identity styles or with BPD symptom status (see Additional [Exploratory] Results for additional information). Another possible explanation is that the neurocognitive tasks included in the current study did not adequately capture the construct. Although the tasks were chosen for their reliable and valid assessment of the executive functions, additional studies should examine other neurocognitive tasks that assess these facets.

The current study has several strengths, including the participation of a large sample of college-aged adolescents, the developmental stage during which there are significant gains in both identity formation (Kroger et al., 2010; Waterman, 1982) and higher-order cognitive processes (i.e., executive functioning) (Budson & Kowall, 2011). Additionally, Phase II methodology employed a mixed-methods approach to examining the relationship between identity formation, interpersonal functioning, and fluid intelligence. Measurement of fluid intelligence using neurocognitive tasks allowed us to assess participants' performance on tasks of planning, abstract reasoning, and problem-solving, which provide greater ecological validity as compared to self-reported abilities of these constructs (Chaytor & Schmitter-Edgecombe, 2003).

However, the study is not without limitations. For example, cross-sectional nature of the study precludes us from determining the temporal relationship between identity formation and interpersonal functioning; any causal interpretations of the current findings, such that diffuse-avoidant identity style causes poorer interpersonal and/or basic executive functioning, should be examined longitudinally. Additionally, the study used a self-report measure of BPD that is not intended to diagnose BPD (Zanarini et al., 2003). Thus, it is possible this measure did not adequately capture BPD symptomatology.

However, 26% of Phase I participants endorsed the identity disturbance criterion on the MSI-BPD, which is consistent with general rates of identity disturbance among individuals diagnosed with BPD (Grilo et al., 2001; Grilo et al., 2004; Stanley & Siever, 2010) and suggests the MSI-BPD may have adequately captured this construct. Future research should examine clinician-assessed BPD in relation to the identity style – interpersonal problems relationship.

Despite these limitations, the current study provides several treatment considerations. Given that identity development does not end with its formation (Sokol, 2009), increased knowledge about the moderating roles of basic executive functioning and BPD symptomatology provides useful targets for clinical intervention. For example, cognitive training on specific aspects of basic executive functioning, such as attentional control (Bherer et al., 2006; Kramer, Hahn, & Gopher, 1999), inhibition (Davidson, Zacks, & Williams, 2003), and task shifting (Kray & Epplinger, 2006) has been shown to reduce cognitive deficits in both young and older adults, which may, in turn, lead to gains in interpersonal functioning for individuals reporting mature identity styles. Similarly, interventions aimed at reducing BPD symptoms, such as Dialectical Behavior Therapy (Linehan, 2015), may serve as a mechanism to decrease interpersonal problems for those reporting immature identity formation. Lastly, identification and assessment of executive functioning ability and BPD symptomatology in treatment-seeking individuals who report immature identity formation may provide useful information for matching them to the most efficacious treatment. Future research should investigate these factors as potential predictors or mediators of treatment outcome.

In summary, the current study examined executive functioning, both basic executive functioning and fluid intelligence, and BPD symptomatology as moderators of the relationship between identity formation, operationalized as the social-cognitive strategies that individuals use to make decisions and process self-relevant information, and interpersonal problems. Results provide further evidence for the differential relationship between the identity styles and interpersonal functioning and suggest that BPD symptomatology and basic executive functioning, but not fluid intelligence, moderate this relationship. The current study also provides treatment considerations, such as the importance of cognitive training and interventions aimed at BPD symptom reduction, as well as directions for future research.

CHAPTER 2
ADDITIONAL (EXPLORATORY) RESULTS

Data Analytic Plan

Exploratory analyses extended investigation of the roles of basic executive functioning / dysexecutive functioning and BPD symptomatology on the relationship between identity style and interpersonal problems by examining the identity style (dummy coded) x number of BPD symptoms x dysexecutive functioning three-way interaction on interpersonal problems. Hierarchical multiple regressions were conducted as described in Phase I with the three-way interaction included as a fourth step in the model.

Additional exploratory analyses examined the moderating roles of (a) basic executive functioning / dysexecutive functioning and (b) fluid intelligence on interpersonal problems for individuals with a more mature identity style as compared to the diffuse-avoidant identity style. For these analyses, the more mature identify styles (normative and informational) were combined to into a single "mature" identity style group to examine whether dysexecutive functioning and/or fluid intelligence serves a protective, compensatory role against interpersonal difficulties for individuals with more mature identity styles. The moderating role of number of BPD symptoms on interpersonal problems for individuals with less mature identity styles as compared to the informational identity style was also explored. For these analyses, the less mature identity styles (diffuse-avoidant and normative) were combined into a single "immature" identity group due to the relationship between BPD and difficulties with identity formation. All preliminary and hierarchical regression analyses were performed as described above for Phases I and II using the dichotomized identity style groupings.

Exploratory analyses also examined the role of individual facets of fluid intelligence (planning, concept formation, abstract thinking) in the relationship between identity style and interpersonal functioning. Analyses were similar to those performed in Phase II, except fluid intelligence was examined as three separate facets (TOL first-move latency, MR number of correct responses, and DKEFS-ST free sorting description score) rather than as one composite construct.

Lastly, due to previously noted associations between the identity styles and varying levels of psychological and psychosocial adjustment, exploratory analyses used data collected during Phase II to examine group differences in levels of psychopathology for participants who self-reported either high or low BPD symptoms based responses to the MSI-BPD.

Phase I

Identity style x BPD x basic executive functioning. To examine the three-way interaction of identity style (dummy coded as described in the Data Analytic Plan) x number of BPD symptoms x dysexecutive functioning three-way interaction on interpersonal problems, hierarchical multiple regressions were conducted as described in Phase I with the addition of the three-way interaction included as a fourth step in the model. As shown in Table 5, the three-way interaction did not account for a significant amount of additional variance in interpersonal functioning.

Diffuse-Avoidant vs combined Informational and Normative identity style. To examine the moderating role of dysexecutive functioning on interpersonal problems for individuals with a more mature identity style as compared to the diffuse-avoidant identity style, the more mature identity styles (normative and informational) were combined into

Table 5.

Summary of hierarchical regressions examining the three-way interaction of identity style, dysexecutive functioning, and Borderline Personality Disorder symptomatology on interpersonal problems (N = 1936)

	Model 4		
	B	SE	β
Controls			
Age	.003	.01	.01
Race	.01	.03	.01
Gender	.06	.03	.04
Main Effects			
I vs D	-.09*	.04	-.06
N vs D	-.08*	.04	-.05
I vs N	-.01	.04	-.01
DEX-S	.02**	.001	.42
MSI-BPD	.06**	.01	.22
2-way Interactions			
I vs D x DEX-S	.01*	.003	.06
N vs D x DEX-S	-.002	.003	-.02
I vs N x DEX-S	.01*	.003	.08
I vs D x MSI-BPD	.01	.01	.02
N vs D x MSI-BPD	.04*	.01	.07
I vs N x MSI-BPD	-.03	.02	-.05
DEX-S x MSI-BPD	.00	.00	.03
3-way Interactions			
I vs D x DEX-S x MSI-BPD	.001	.001	.01
N vs D x DEX-S x MSI-BPD	.00	.001	-.004
I vs N x DEX-S x MSI-BPD	.001	.001	.02
F total		82.46**	
Adjusted R^2		.38	
Δ*F*		.22	
ΔR^2		.00	

Note: **$p < .001$; *$p < .05$; I = Informational identity style; N = Normative identity style; D = Diffuse-Avoidant identity style; DEX-S = Dysexecutive Questionnaire Total Score; MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder Questionnaire Total Score

a single "mature" identity style group vs. diffuse-avoidant identity style. Based on this reclassification, slightly more participants were considered to have a mature identity style (53.2%) as compared to diffuse-avoidant (46.8%). The two identity groups differed with regard to gender (mature group had a higher proportion of males) and racial distribution (see Table 6). Post-hoc analyses showed that a greater proportion of Caucasians and a smaller proportion of Asians in the mature identity style group. Due to these results, the demographic variables of gender and race (recoded as Caucasian [n = 1141] and non-Caucasian [n = 764]) were added as covariates to Aim 1 analyses. The identity style groups did not differ in age (see Table 6).

Group differences in dysexecutive functioning and interpersonal functioning were assessed using independent samples t-tests. Individuals who report a mature identity style report less dysexecutive functioning (M = 19.85, SD = 12.12) than individuals with a diffuse-avoidant identity style (M = 29.62, SD = 15.55), $t(1934) = 15.52$, $p < .001$, d = 0.71. Individuals who report a mature identity style also report fewer interpersonal difficulties (M = 1.08, SD = .66) than individuals with a diffuse-avoidant identity style (M = 1.40, SD = .76), $t(1934) = 9.83$, $p < .001$, d = 0.45.

A hierarchical regression examined dysexecutive functioning as a moderator of the relationship between identity style and interpersonal functioning (see Table 7). Tests for multicollinearity indicated that a very low level of multicollinearity was present (VIF's between 1.02 and 1.14). Step 1 revealed no significant effects of demographic variables (gender and race) and added no significant amount of variance in interpersonal functioning to the null model (the constant-only model). Step 2, which included the main effects of identity style and dysexecutive functioning, accounted for a significant amount

Table 6.

Demographic information of participants in Phase I and Phase II by identity style classification of mature (normative and informational) identity style and diffuse-avoidant identity style

	Phase I (N = 1936)				Phase II (N = 71)			
	Diffuse-Avoidant Identity Style (n = 907)	Mature Identity Style (n = 1029)	t/X^2 value	Cohen's d/ Cramer's V	Diffuse-Avoidant Identity Style (n = 33)	Mature Identity Style (n = 38)	t/X^2 value	Cohen's d/ Cramer's V
Age *M (SD*)	20.06 (1.64)	19.99 (1.68)	.92	.04	20.03 (1.55)	20.24 (1.28)	-.61	.15
Female *n* (%)	594 (66)	763 (75)	17.55**	.10	22 (67)	33 (87)	4.12*	.24
Race *n* (%)			22.18**	.11			10.75*	.39
AA	131 (14)	133 (13)			3 (9)	9 (24)		
Caucasian	489 (54)	652 (64)			13 (40)	23 (60)		
Asian	158 (17)	116 (11)			11 (33)	4 (10)		
Multiracial	63 (7)	64 (6)			3 (9)	1 (3)		
Other/DNS	66 (8)	64 (6)			3 (9)	1 (3)		

Note: **p < .001; *p < .05; DNS = Did not state race, AA = African American

Table 7.

Results of hierarchical regression examining executive functioning as a moderator of the relationship between identity style and interpersonal problems (N = 1936)

	Model 1			Model 2			Model 3		
	B	SE	β	B	SE	β	B	SE	β
Controls									
Race	.01	.03	.007	-.01	.03	-.005	-.01	.03	-.005
Gender	.05	.04	.03	.10**	.03	.07	.11**	.03	.07
Main Effects									
Identity Style				.07*	.03	.05	.24**	.06	.14
DEX-S				.03**	.001	.55	.03**	.002	.61
Interaction									
Identity Style X DEX-S							-.01*	.002	-.14
F total	1.04			220.29**			178.35**		
Adjusted R^2	.00			.32			.32		
Δ*F*	1.04			439.06**			7.55*		
ΔR^2	.001			.32			.003		

Note: ** $p < .001$, *$p < .05$; Identity Style = Mature identity style (informational and normative) vs diffuse-avoidant identity style; DEX-S = Dysexecutive Questionnaire Total Score

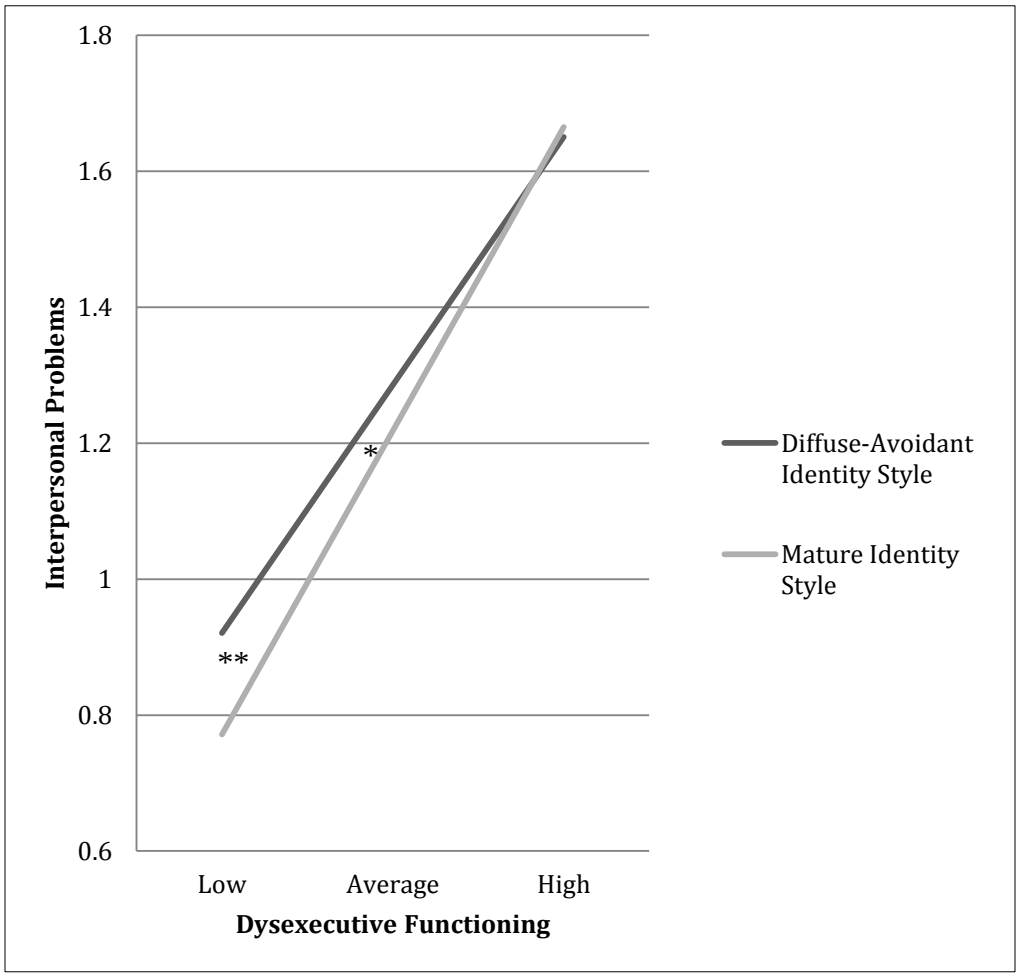
of variance, with diffuse-avoidant identity style and higher dysexecutive functioning predicting to more interpersonal problems. Step 3 (two-way interaction) was also significant.

Conditional effects were examined for the significant interaction at low (-1 SD), average (0 SD), and high (+1 SD) levels of dysexecutive functioning. As shown in Figure 4, at average to low levels of dysexecutive functioning, individuals with a mature identity style reported significantly fewer interpersonal problems than those with a diffuse-avoidant identity style, (dysexecutive function = 0 SD [b = 0.07, t(1884) = 2.27, p = .02, d = 0.10]; dysexecutive function = -1 SD [b = 0.15, t(1884) = 3.61, p < .001, d = 0.17]). However, at high levels of dysexecutive functioning there was no difference between diffuse-avoidant and mature identity style on interpersonal problems, b = -0.01, t(1884) = -0.34, p = .73, d = -0.02.

Informational vs. combined Normative and Diffuse-Avoidant Identity Style. To examine the moderating role of number of BPD symptoms on interpersonal problems for individuals with a less mature identity style as compared to the informational identity style, the less mature identity styles (normative and diffuse-avoidant) were combined into a single "immature" identity style group vs. informational identity style group. Based on this reclassification, more participants were considered to have an immature identity style (74.1%) as compared to an informational identity style (25.9%). The groups did not differ in gender distribution, but did differ in both age and race (see Table 8). Participants in the informational style identity group were significantly older than participants who endorsed an immature identity style. Post-hoc 2x2 chi-squares analyses indicted that participants in the informational identity style group were more likely to identify as Caucasian (vs.

Figure 4.

The relationship between Diffuse-Avoidant (vs. Mature) identity style and interpersonal problems as a function of (dys)executive functioning



Note: $^{**}p < .001$, $^{*}p < .05$; Interpersonal Problems = Inventory of Interpersonal Problems Total Score; Dysexecutive Functioning = Dysexecutive Questionnaire Total Score

Table 8.

*Demographic information and psychosocial functioning of participants in Phase I by identity style classification of immature (normative and diffuse-avoidant) identity styles and informational identity style (*N = *1936)*

	Informational Identity Style (*n* = 501)	Immature Identity Style (*n* = 1435)	*t*/X^2 value	Cohen's *d*/ Cramer's *V*
Demographic Information				
Age *M (SD*)	20.26 (1.78)	19.94 (1.61)	3.68**	.19
Female *n* (%)	349 (70)	1008 (70)	.05	.01
Race *n* (%)			28.88**	.12
AA	56 (11)	208 (15)		
Caucasian	332 (66)	809 (56)		
Asian	40 (8)	234 (16)		
Multiracial	39 (8)	88 (6)		
Other/DNS	34 (7)	96 (7)		
Study Variables (*M, SD*)				
IIP	1.10 (.69)	1.28 (.74)	-4.79**	.25
DEX-S	19.96 (11.72)	25.98 (15.26)	-8.04**	.44
MSI-BPD	3.60 (2.67)	3.17 (2.86)	2.95**	.16

Note: **$p < .01$; AA = African American, DNS = Did not state race; IIP = Inventory of Interpersonal Problems; DEX-S = Dysexecutive Questionnaire – Self-Report; MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder

African-American or Asian) and less likely to identify as Asian (vs. Multiracial or Other/Did not state race) or African-American (vs. Multiracial) relative to the immature identity style group. Due to these results, the demographic variables of age and race were added as covariates in the hierarchical regression analysis.

Group differences in interpersonal functioning and BPD symptomatology were calculated using independent samples *t*-tests (see Table 8). Results showed that individuals in the informational identity style group reported significantly fewer interpersonal problems and more BPD symptoms than individuals in the immature identity style group.

A hierarchical regression examined number of BPD symptoms as a moderator of the relationship between identity style and interpersonal functioning (see Table 9). Tests for multicollinearity indicated that a very low level of multicollinearity was present (VIF's between 1.01 and 1.26). Step 1 revealed no significant effects of demographic variables (age and race) and added no significant amount of variance in interpersonal functioning to the null model (the constant-only model). Step 2, which included the main effects of identity style and BPD symptoms, accounted for a significant amount of variance, with immature identity style and increased BPD symptoms both predictive of increased interpersonal problems. Step 3, the identity style x BPD symptom number interaction, did not account for a significant amount of additional variance in interpersonal functioning.

Phase II

Diffuse-Avoidant vs combined Informational and Normative identity style. To examine the moderating role of fluid intelligence on interpersonal problems for

Table 9.

Results of hierarchical regression examining Borderline Personality Disorder symptomatology as a moderator of the relationship between identity style and interpersonal problems (N = 1936)

	Model 1			Model 2			Model 3		
	B	SE	β	B	SE	β	B	SE	β
Controls									
Age	-.01	.01	-.03	.00	.01	.01	.00	.00	.01
Race	.02	.03	.01	.01	.03	.01	.02	.03	.01
Direct Effects									
Identity Style				-.08*	.03	-.05	-.22**	.06	-.13
MSI-BPD				.07**	.01	.27	.06**	.01	.23
2-way Interactions									
Identity Style x MSI-BPD							-.001	.01	-.01
F total		.76			224.58**			141.98**	
Adjusted R^2		.00			.37			.37	
ΔF		.76			373.49**			3.07*	
ΔR^2		.00			.37			.00	

Note: ** $p < .001$, *$p < .05$; Identity Style = Immature identity style (diffuse-avoidant and normative) vs informational identity style; MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder Total Score

individuals with a more mature identity style as compared to the diffuse-avoidant identity style, the more mature identity styles (normative and informational) were combined into a single "mature" identity style group vs. diffuse-avoidant identity style. Based on this reclassification, slightly more participants were considered to have a mature identity style (53.5%) as compared to the diffuse-avoidant identity style (46.5%). The groups did not differ in age, but differed in race and gender (see Table 6). Post-hoc 2x2 chi-squared analyses indicted that participants in the mature identity style group were more likely to identify as Caucasian (vs. Asian) than those in the diffuse-avoidant group. Additionally, a higher proportion of males identified as having a diffuse-avoidant identity style and women as having a mature identity style. Due to these results, race (recoded as Caucasian [n = 38] and non-Caucasian [n = 33]) and gender were added as covariates in the regression analysis.

Independent samples t-tests were calculated to examine group differences in fluid intelligence and interpersonal functioning. Results indicated that individuals who report a mature identity style report fewer interpersonal difficulties (M = .99, SD = .68) than individuals with the diffuse-avoidant identity style (M = 1.47, SD = .76), $t(69) = 2.79$, p = .004, d = .66. However, there was no group difference for level of fluid intelligence (M = -.07, SD = 1.42; M = .05, SD = 2.56) between the identity style groups, $t(69) = -.23$, p = 0.82, d = -.06.

A hierarchical regression examined fluid intelligence as a moderator of the relationship between identity style and interpersonal functioning (see Table 10). Tests for multicollinearity indicated that a very low level of multicollinearity was present (VIF's between 1.08 and 1.23). Step 1 revealed no significant effects of demographic variables

Table 10.

Results of hierarchical regression examining fluid intelligence as a moderator of the relationship between identity style and interpersonal functioning (N = 71)

	Model 1			Model 2			Model 3		
	B	SE	β	B	SE	β	B	SE	β
Controls									
Race	.17	.18	.11	.14	.19	.09	.27	.20	.18
Gender	-.10	.22	-.06	.04	.22	.03	-.05	.22	-.03
Direct Effects									
Identity				.47**	.18	.31	.42*	.18	.28
FI				.02	.05	.06	.08	.05	.22
Interaction									
Identity X FI							-.23*	.11	-.29
F total		.56			2.01			2.60*	
Adjusted R^2		-.01			.06			.10	
Δ*F*		.56			3.42*			4.50*	
ΔR^2		.02			.10			.06	

Note: ** $p < .001$, *$p < .05$; Identity = Mature identity style (informational and normative) vs diffuse-avoidant identity style; FI = Fluid intelligence composite score (abstract reasoning, planning, problem-solving)

(gender and race) and added no significant amount of variance in interpersonal functioning to the null model (the constant-only model). Step 2, which included the main effects of identity style and fluid intelligence, accounted for a significant amount of variance, with diffuse-avoidant identity style predicting to more interpersonal problems. Step 3 (two-way interaction) was also significant, with mature identity style and impaired interpersonal functioning more strongly related at low levels of fluid intelligence.

Fluid intelligence facets. Earlier Phase II analyses revealed no correlations between fluid intelligence and identity style or interpersonal functioning. However, it is possible that significant effects for one of the three facets of fluid intelligence were masked by the composite measure of fluid intelligence used in our initial analyses. To explore this hypothesis, we correlated each of the three facets of fluid intelligence (i.e., planning, problem-solving, abstract reasoning) with our study measures of executive functioning, interpersonal functioning, and BPD symptomatology. For purposes of the current analyses, z-scores were used for each of the three neurocognitive tasks[1]. As reported below, the correlation analyses for the individual fluid intelligence facets support our earlier non-significant findings using a composite measure of fluid intelligence.

Planning**.** Results indicate that length of time that a participant waited before initiating a solution for a given problem on the TOL task (first-move latency) was not associated with identity style (ρ = .08, p = .52), BPD symptoms (r = .001, p = .99), interpersonal problems (r = 0.10, p = .93), or dysexecutive functioning (r = -.02, p = .86).

[1] For consistency with previously reported fluid intelligence analyses, results using z-scores for each of the three neurocognitive tasks are presented. However, we also calculated correlations using the raw scores, which produced the same pattern of results.

Problem-solving**.** Results indicate that total number of puzzles solved correctly on the MR task was not associated with identity style (ρ = .001, p = .99), BPD symptoms (r = -0.11, p = .35), interpersonal problems (r = -.11, p = .35), or dysexecutive functioning (r = 0.04, p = .77).

Abstract Reasoning**.** Results indicate that a participant's description score during the free sorting task on the DKEFS-ST was not associated with identity style (ρ = 0.01, p = .95), BPD symptoms (r = 0.15, p = .21), interpersonal problems (r = 0.13, p = .30), or dysexecutive functioning (r = 0.15, p = .21).

Psychopathology. Participants were invited to participate in Phase II of the current study if they met the study inclusion criteria of reporting significant BPD symptoms (i.e., answering "yes" to seven or more questions on the MSI-BPD) or reporting very few BPD symptoms (i.e., answering "yes" to no more than one question on the MSI-BPD). Then, as part of Phase II, participants completed a series of diagnostic assessments to better characterize the psychopathology of participants who self-selected into the high and low MSI-BPD groups. Exploratory analyses of group differences on levels of psychopathology are presented below.

Overall, participants in the high MSI-BPD group showed increased psychopathology compared to participants in the low MSI-BPD group. As shown in Table 11, a series of chi-squared analyses revealed that participants in the high MSI-BPD group were more likely than participants in the low MSI-BPD group to be diagnosed with BPD, supporting the MSI-BPD as a measure of BPD symptomatology. Individuals in the high MSI-BPD group were also more likely to have a history of mood disorder or anxiety disorder as well as more likely to report a history of non-suicidal self-injury. However,

Table 11.

Psychopathology of participants in Phase II by self-reported Borderline Personality Disorder Status (N = 71)

	Low MSI-BPD (n = 39)	High MSI-BPD (n = 32)	t/X^2 value	Cohen's d/ Cramer's V
GAF (M, SD)	79.79 (8.56)	63.69 (11.07)	6.91**	1.63
History of Psychopathology n (%)				
BPD	0 (0.00)	8 (25.00)	10.99**	.39
NSSI	2 (5.12)	12 (37.50)	11.64**	.41
Mood Disorders	6 (15.38)	26 (81.25)	30.80**	.66
Anxiety Disorders	6 (15.38)	17 (53.13)	9.81*	.39
Alcohol Use Disorders	4 (10.26)	8 (25.00)	2.32	.19
Substance Use Disorders	2 (5.12)	3 (9.38)	0.48	.08
Childhood Disorders	5 (12.82)	4 (12.50)	.002	.01

Note: **p < .01, *p < .05; Low MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder score ≤ 1; High MSI-BPD = McLean Screening Instrument for Borderline Personality Disorder score ≥ 7; GAF = Global Assessment of Functioning; BPD = Borderline Personality Disorder; NSSI = Non-suicidal self-injury

the groups did not differ in diagnosis of alcohol use disorders, substance use disorders, or childhood disorders. Participants in the high MSI-BPD group were also assigned a lower Global Assessment of Functioning score relative to participants in the low MSI-BPD group.

Of the 39 participants who met the cut-off threshold for the MSI-BPD, less than one-third (n = 8) were assigned a full BPD diagnosis. Thus, the current study did not analyze BPD diagnosis in the identity style – interpersonal functioning relationship due to the small sample size and low power to detect group differences.

CHAPTER 3

EXTENDED LITERATURE REVIEW

Identity Formation: A Theoretical and Empirical Review

Identity is a multidimensional construct that is one of the most commonly studied in the social sciences (Brubaker & Cooper, 2000; Cote, 2006). It encompasses self-definition at the individual level of goals, values, and beliefs as well as perceived roles within relationships and broader identification with social groups and categories (Sedikides & Brewer, 2001). Identity organizes answers to questions about self-definition and one's fit within the larger world (Galliher & Kerpelman, 2012). Having a strong sense of identity is associated with psychological well-being, with the idea being that having clearer and firmer convictions about one's beliefs, goals, and self-relevant standards makes it easier to persevere in the face of difficulties or temptations to change course and, thus, to achieve one's aims (Chandler, Lalonde, Sokol, Hallett, & Marcia, 2003).

Investigation into the concept of identity is not new. In fact, the Western tradition of turning inward to look for answers to the quintessential identity question "Who am I?" can be traced back to Greco-Roman civilization (Schwartz, Luyckx, & Vignoles, 2011). However, there exists some debate among scholars as to the exact time at which a concept of the self appears that resembles the contemporary notion of identity. There is some evidence of this line of thought that emerges from the writings of the Stoic philosophers (i.e., Seneca [4 BC–65 AD], Epictetus [55–135 AD], Aurelius [121–180 AD]) and literary texts from the later stages of ancient Roman civilization, with the latter including autobiographies that reference an interior world of thoughts and feelings

expressed in terms of a private realm that is distinct from the public one (Schwartz et al., 2011). In this way, individuals were able to use writing as a medium for reflecting on the aspects of the self that others could know about, unless shared.

A more commonly cited origin of the philosophy of identity, however, is Descartes seventeenth century statement: I think therefore I am (Ricoeur, 1992). In this statement, Descartes asserts that the knowledge that he is thinking is bound to the knowledge of his existence (Buckingham, 2011). Thus, there is a thinking self, or an inner self, that is distinct from the surrounding world. It has been argued that only after Descartes' statement does subjective knowledge become central for Western philosophy (Schwartz et al., 2011). Prior to Descartes' philosophical writings, there was more of an emphasis on the individual as a foil to his or her peers and social ranking (Bakhtin, 1981) and less on the individual as a separate, autonomous being.

Given the strong link between philosophy and psychology (e.g., Balz, 1941), it is not surprising that early psychologists sought to conceptualize the concept of identity. James (1890) was one of the first psychologists to address the question of identity. He provided a useful working definition of the self, describing it as both a cognitive structure (e.g., differentiating that which is me vs. not me, that which is the current me vs. future potential me) and the content (all the qualities that a person can define as his or her own), feelings, and actions that accompany this content (Schwartz et al., 2011).

Freud also provided an early theory of identity formation. He believed that one's sense of self was derived from parental introjections during childhood and that this sense of self was not significantly revised or updated during adolescence or adulthood (Freud, 1930; Schwartz et al., 2011). Therefore, according to Freud, one's self-concept was

believed to be a function of the basic identification processes that occur during the preschool years. Although Freud wrote extensively on identification and other identity-like processes (e.g., Freud, 1905), the first writing to move identity formation beyond childhood identification and parental introjections was Erikson's *Childhood and Society* (1950) (Schwartz, 2001).

In his writings, Erikson (1950, 1968) extended the current theory of identity development from childhood into adolescence, which has become the predominant developmental period of interest for identity formation. Although Erikson did not specify an exact time frame for adolescence (Arnett, 2000), consistent with current conceptualizations, this review will operationalize "adolescence" as the period of time between puberty and adulthood that is roughly defined as ages 10 to early 20's (Adamson & Lyxell, 1996; Smetana, Campione-Barr, & Metzger, 2006). Erikson postulated that the formation of one's identity is as a lifelong developmental process that starts when infants begin establishing autonomy and self-awareness by recognizing that they are individuals separate from their mother (Anderman & Anderman, 2009) and continues throughout adulthood. Evidence of this early individuation is observed when children display self-directed behavior (e.g., wiping his or her own nose after it had been surreptitiously dabbed with rouge) when placed in front of a mirror (Lewis & Brooks-Gunn, 1979); this suggests the presence of an internal representation of one's physical self. Around this time, young children also demonstrate the emergence of cognitive self-awareness, including using language that enables the verbal expression and representation of the Me-self (Case, 1991; Harper, 1999) such as personal pronouns ('me,' 'mine') and self-descriptive statements ('I sit,' 'I do it myself') that reflect self-awareness (Kim Koh &

Wang, 2012). By preschool, the child has a self-concept centered on their physical features, possessions, and that are concrete and tend to be isolated and lacking in coherence (Anderman & Anderman, 2009; Harter, 1999, 2006).

The formation of self-concept continues throughout middle childhood (ages 7 to puberty), as responsibility and freedom increase and peer interaction provides opportunities for increased comparisons to others. This ideally leads to industry and increased self-efficacy (Anderman & Anderman, 2009; Kim Koh & Wang, 2012). During middle childhood, children show increasing understanding of their less tangible characteristics, such as traits and emotions, and show interest in the continuity of the self over time (Ferguson, Van Roozendaal, & Rule, 1986). They use social comparisons more often to understand themselves and to evaluate their skills or talents relative to those of friends or classmates (Ruble & Frey, 1991). In addition, children of this age show some abilities to coordinate previously compartmentalized self-representations (Kim Koh & Wang, 2012).

For Erikson, and many researchers that came after him, the greatest gains in identity formation appear during adolescence. New identity issues are raised and novel possibilities are considered during adolescence, which is defined by the central psychosocial crisis of identity vs. identity diffusion (Erikson, 1968). Adolescents must integrate childhood identifications with environmental factors (e.g., family or peer relationships, education) to form a larger, self-identified identity (Schwartz, 2001). An inability to synthesize one's identity during adolescence is thought to impair subsequent stages of psychosocial development, including the ability to form intimate relationships (Erikson, 1968). The college years, which coincide with late adolescence, provide a

diversity of novel experiences that can serve to both trigger consideration of identity issues and to suggest alternative resolutions for identity concerns (Kroger, Martinussen, & Marcia, 2010; Waterman, 1982). Nevertheless, identity development does not end with the transition to adulthood (Waterman, 1982). Adults continue to strengthen their identity by synthesizing new environmental factors (e.g., marriage, children) into their current conceptualization of themselves (O'Connell, 1976; Waterman, 1982).

Despite developing an extensive framework from which to view the development and associated outcomes of identity synthesis, however, Erikson did not attempt to operationalize his theory (Adams & Montemayor, 1983). As a result, several researchers have attempted to operationalize Erikson's theoretical statements about identity (e.g., Gruen, 1964; Tan, Kendis, Porac, & Fine, 1977), although Marcia's identity status model (1966) has been the most influential. Marcia extended Erikson's theory by categorizing individuals by their ability to re-think, sort through, and try out various roles and life plans (exploration) and to invest in an expressed course of action or belief (commitment). He identified four distinct identity outcomes that an individual could attain based on his or her level (high vs. low) of exploration and of commitment: achievement, foreclosure, moratorium, and diffusion (Marcia, 1966). The identity status model has provided an enduring framework for operationalizing Erikson's theory and correlates of the four identity statuses have been extensively researched for over 40 years (e.g., Archer, 1989b; Kroger et al., 2010; Lillevoll, Kroger, & Martinussen, 2013; Weinreich, Doherty, & Harris, 1985).

The identity status model focuses on the *outcomes* of identity formation. More recently, there has been a shift in focus to the *process* by which identity is formed rather

than individual differences in identity outcomes (Berzonsky, 1989). Berzonsky (1989) proposed a process model of identity formation that focuses on differences in the social-cognitive processes and strategies that individuals use to engage in, or avoid, the tasks of constructing, maintaining, and/or reconstructing a sense of identity. He identified three identity styles based on an individual's willingness to search for an identity and form commitments: informational, normative, and diffuse-avoidant (Berzonsky, 1989). Current research suggests that identity style is related to the identity status in that, for example, using a less mature strategy for identity formation (i.e., diffuse-avoidant) is associated with a less mature identity status (i.e., diffusion) (Berzonsky & Kuk, 2000; Crocetti, Sica, Schwartz, Serafini, & Meeus, 2013; Streitmatter, 1993b). Identity style is also associated with psychosocial impairments, such as the poor use of coping strategies (Berzonsky, 1992, 2003) and psychopathology, including borderline personality disorder (Berzonsky, 1992, 2003; Jørgensen, 2009). Taken together, the identity status and identity style models provide empirical support for Erikson's conceptualization of psychosocial development.

These models, as well as Erikson's original theory, also emphasize that both typical and pathological identity formation exist. Typical identity processes that occur during adolescence include the ability to choose a career, achieve intimacy with others, and find a place in the larger society (Erikson, 1950, 1968). It is widely acknowledged, however, that not all identity formation follows a typical trajectory. That is, many individuals are unable to properly explore and commit to specific self-defining actions (e.g., career choice) or beliefs (e.g., religious) (Marcia, 1966). The limited empirical evidence suggests that pathological identity formation is associated with several adverse

correlates including a lack of capacity for higher-level cognitive functioning (Erikson, 1980), personality traits such as neuroticism (Luyckx, Goossens, Soenens, & Beyers, 2006), an insecure attachment style (Årseth, Kroger, Martinussen, & Marcia, 2009), and disrupted relationships with parents (Nawaz, 2011). Pathological identity is also thought to have a reciprocal relationship with ethnicity (Phinney, 1996) and religious background (Hunsberger, Pratt, & Pancer, 2001).

Furthermore, a nascent, but growing body of evidence suggests that the lack of a clear sense of identity is associated with psychopathology and social maladjustment. Specifically, research indicates that difficulty forming an identity increases the risk for borderline personality disorder (Modestin, Oberson, & Erni, 1998), eating disorders (Weinreich et al., 1985), non-suicidal self-injury (Breen, Lewis, & Sutherland, 2013), low self-esteem and depression (Nurmi, Berzonsky, Tammi, & Kinney, 1997), and substance use in adolescents (Jones & Hartmann, 1988). Individuals who report pathological identity formation also show decreased well-being, increased academic difficulties and peer relationship problems (Berzonsky & Kuk, 2000), as well as significant psychosocial impairments (Berzonsky, 1990, 2003).

The purpose of the current review is to provide a theoretical and empirical overview of the processes and outcomes associated with typical and pathological identity formation. To do so, this review will operationalize identity as a concept composed of an individual's goals and beliefs (individual), role relative to other people (relational), and identification with groups and societal categories (collective). Once identity is defined, the review will explore identity literature in the following areas: (1) contemporary theories of identity formation, including Erikson's (1950) theory of psychosocial

development, Marcia's (1966) identity status model, and Berzonsky's (1989) process model of identity styles, (2) correlates of identity formation at the individual (e.g., cognitive functioning, gender, personality), relational (i.e., attachment, parenting style, peer relationships), and collective levels (i.e., ethnicity, religion) that affect an individual's overall identity formation, and (3) psychopathological and psychosocial outcomes associated with pathological identity formation, including borderline personality disorder, substance use, and social maladjustment. Limitations of the research to date and avenues for future investigation will also be discussed.

Defining Identity

A working definition of identity should be established in order to best discuss typical and pathological identity formation. This task, however, is difficult. The complex nature of the core question addressed by identity researchers (i.e., "Who am I?") encompasses a range of diverse but related contents and processes that are emphasized in different fields of research, and in different theoretical perspectives (Schwartz et al., 2011). This question is further complicated by an ongoing debate regarding the relationship between "identity" and "self," with some researchers arguing that the distinction is artificial (Breakwell, 1987; Roeser, Peck, & Nasir, 2006) and others suggesting ways in which the two constructs may be differentiated (Côtè & Schwartz, 2002; Schwartz et al., 2011).

A review of the literature reveals little agreement on how identity is defined (Bosma, Graafsma, Grotevant & de Levita, 1994). Researchers have conceptualized identity to include such concepts as internal meaning systems (Marcia, 1966; Schwartz, 2001), characteristics and attachments conferred through group memberships (Brown,

2000; Tajfel & Turner, 1986), nationalism (Schildkraut, 2007), positions taken in conversations (Bamberg, 2006), and social–historical currents in belief systems (Burkitt, 2004). More broadly, identity has also been defined as a structure (e.g., van Hoof & Raaijmakers, 2003) or a configuration (e.g. Schachter, 2004) at times and as a process at other times. It is often considered to have both conscious and subconscious aspects (Kroger, 2004).

For purposes of the current review, the terms "identity" and "self" will be used interchangeably to refer to a complex representation of the self that pertains to an individual's (a) personal goals and beliefs, (b) role relative to others, and/or (c) identification with groups and social categories. These three levels of identity definition, proposed by Sedikides and Brewer (2001), form a hierarchical framework through which identity can be viewed. This conceptualization of identity was chosen as the framework for the current review because it integrates theories of identity that developed independently in psychological fields such as developmental, social, and cross-cultural as well as across the disciplines of sociology, philosophy, and anthropology (Schwartz et al., 2011).

Individual identity refers to aspects of self-definition at the level of the individual person. These may include goals, values, and beliefs (Marcia, 1966; Waterman, 1999), religious and spiritual beliefs (MacDonald, 2000), standards for behavior and decision-making (Atkins, Hart, & Donnelly, 2005; Hardy & Carlo, 2005), self-esteem and self-evaluation (Kernis, Lakey, & Heppner, 2008; Sedikides & Gregg, 2008), desired, feared, and expected future selves (Markus & Nurius, 1986), and one's overall "life story" (Mcadams, 2006). In addition to focusing on individual-level contents of identity,

theories of personal identity tend to focus on individual-level processes, often emphasizing the role of an individual's sense of agency in creating or discovering his or her own identity (Côté & Levine, 2002; Schwartz et al., 2011). Specifically, that higher levels of self-reported agency is associated with more mature identity development (Côtè & Schwartz, 2002).

Relational identity refers to an individual's role relative to other people, including roles such as child, spouse, parent, co-worker, supervisor, and customer. Relational identity refers not only to these roles, but also to how they are defined and interpreted by the individuals who assume them (Sedikides & Brewer, 2001). Further, relational identity is thought to be defined and located within interpersonal space (Bamberg, 2004; Chen, Boucher, & Tapias, 2006; Kerpelman, Pittman, & Lamke, 1997), within families (Grotevant, Dunbar, Kohler, & Esau, 2000; Manzi, Vignoles, Regalia, & Scabini, 2006), or in the roles that an individual plays within a larger system (e.g., the workplace) (Thatcher & Zhu, 2006).

Collective identity refers to an individual's identification with the groups and social categories to which they belong, the meanings that they give to these social groups and categories, and the feelings, beliefs, and attitudes that result from identifying with them (Ashmore, Deaux, & McLaughlin-Volpe, 2004; De Fina, 2007; Tajfel & Turner, 1986). Collective identity can refer to membership in any form of social group or category, including ethnicity (Taylor, 1997), nationality (Schildkraut, 2007), religion (Cohen, Hall, Koenig, & Meador, 2005), and gender (Bussey & Bandura, 1999), as well as more intimate groups such as families (Schwartz et al., 2011). Theoretical approaches to collective identity tend to focus also on collective processes. For example, examining

how moment-to-moment changes in inter-group contexts can shape self-conceptions, leading people to shift from viewing themselves as individuals to viewing themselves as group members (e.g., Turner, Hogg, Oakes, Reicher, & Wetherell, 1987).

As previously noted, it has been suggested that these three aspects of identity provide the basis for an integrated operational definition of identity (Sedikides & Brewer, 2001). That is, viewed through the lens of an individual person, identity consists of the convergence of one's self-chosen or ascribed commitments, personal characteristics, and beliefs about oneself; roles and positions in relation to significant others; as well as one's membership in social groups and categories (including both one's status within the group and the group's status within the larger context) (Schwartz et al., 2011; Sedikides & Brewer, 2001).

It is also important to note that multiple aspects of identity can – and do – coexist (i.e., an individual may identify herself simultaneously as a psychologist, daughter, American, cat owner, Philadelphia resident, etc). Different aspects of identity will be more or less salient and relevant in different social contexts (Turner & Onorato, 1999). Further, these multiple aspects of identity are not independent of each other; they intersect and interact (e.g., Amiot, la Sablonniere, Terry, & Smith, 2007; Crenshaw, 1991), even though one may not be aware of the identity process at work.

In addition to containing multiple interactive aspects, identity is also thought to have both conscious and subconscious components. Many identity processes are undertaken deliberately and involve a conscious effort on the part of the individual, such as exploring potential goals, values, and beliefs and committing oneself to one or more of the options considered (Schwartz et al., 2011). In contrast, identity processes such as

attempts to defend one's self-esteem against threats (e.g., psychodynamic defense mechanisms such as regression or dissociation) (Vaillant, 1994) or the process by which different identity aspects shift in salience depending upon social contexts, are thought to occur outside of an individual's awareness (Schwartz et al., 2011). In sum, the current review will examine the developmental trajectory of typical and pathological identity formation from the perspective of how individual, relational, and collective factors of identity interact to form an overall integrated sense of identity.

Contemporary Theories of Identity Formation

Modern studies of identity are largely based on Erikson's (1950) theory of psychosocial development and the two most prominent theories that operationalize Erikson's conceptualization of identity development are the identity status model (Marcia, 1966) and the process model of identity styles (Berzonsky, 1989). Together, these theories address the typical developmental trajectory of identity formation and posit there are individuals who are unable to achieve full identity formation.

Psychosocial Theory of Identity Development

Modern study of identity has its origin in Erikson's (1950) theory of psychosocial development. Within this theory, Erikson (1950, 1968) identified eight stages of development across the lifespan. These stages correspond to a series of crises that one faces as he or she develops and matures from infancy through childhood to adulthood and are marked by a chronological stage-specific psychosocial challenge and goal for its resolution (Erikson, 1968; Munley, 1977). The eight psychosocial crisis were identified as: trust vs. mistrust (infancy), autonomy vs. shame and doubt (early childhood), initiative vs. guilt (preschool), industry vs. inferiority (school age), identity vs. identity

diffusion (adolescence), intimacy vs. isolation (young adult), generativity vs. stagnation (middle adult), and integrity vs. despair (late adult) (Erikson, 1950, 1968). Ideally, at each phase there is integration between the developing individual and their social milieu, resulting in the positive resolution of psychosocial crises (Erikson, 1968; Schwartz et al., 2011).

As noted, the fifth psychosocial crisis was identified as identity vs. identity diffusion and conceptualized as occurring during adolescence (Erikson, 1950, 1968). According to Erikson, the formation of a healthy identity includes the ability to choose a career, achieve intimacy with others, and find a place in the larger society. It is believed that a clear set of identity-related goals, values, and beliefs are advantageous because they serve as guidelines that facilitate decision-making (Bosch & Card, 2012; Schwartz et al., 2011). In contrast, identity diffusion (i.e., the absence of identity-related goals, values, and beliefs) may interfere with the decision-making process, leaving an individual apathetic, confused, and/or ambivalent when faced with important life choices (Erikson, 1950, 1968). Identity diffusion manifests itself in a number of ways: 1) in a subjective sense of incoherence; 2) in difficulty committing to roles and occupational choices; and 3) in a tendency to confuse one's own attributes, feelings, and desires with those of another person in intimate relationships and hence to fear a loss of personal identity when a relationship dissolves (Erikson, 1968; Schwartz et al., 2011). As such, identity diffusion is associated with negative outcomes, including poor peer relations (Berzonsky & Kuk, 2000).

In attempt to escape identity diffusion, some individuals choose a "negative identity" (i.e., a role that is inappropriate or unusual given the individual's attributes,

such as race or socioeconomic status) that often constitutes a role or group identification negatively viewed by the broader culture (e.g., as a self-injurer) (Breen et al., 2013; Wilkinson-Ryan & Westen, 2000). This "negative identity" then affects an individual's current interactions with sociocultural factors as well as shapes how he or she will interpret future interactions. This is because attaining identity involves establishing a reciprocal relationship with society while maintaining feelings of continuity within the self -- a reformulation of all that the individual has been into a core of what he is to become (Erikson, 1950, 1968). Thus, for Erikson, the psychosocial task of identity development via resolution of the identity vs. identity diffusion crisis requires adolescents to formulate a stable sense of self (their "identity") that is grounded in a set of personal goals, values, and beliefs (Bosch & Card, 2012; Erikson, 1968).

Identity Status Model

Building upon Erikson's work, Marcia (1966) developed a systematic approach for examining selected dimensions of adolescent identity formation that has been one of the earliest and most enduring theories for conceptualizing identity. Marcia (1966) proposed two criteria for the presence of identity formation: exploration and commitment. Exploration refers to a period of re-thinking, sorting through, and trying out various roles and life plans. The exploratory period is a time when the late adolescent is actively involved in choosing among meaningful alternatives. Commitment refers to the degree of personal investment the individual expressed in a course of action or belief. Individuals are rated as high or low for both constructs. Given this 2x2 design, individuals fall into one of four identity statuses: achievement, foreclosure, moratorium, and diffusion (Marcia, 1966).

Individuals fitting the identity achievement status reflect a high level of commitment after a time of significant exploration (Marcia, 1966). From a developmental standpoint, this status is considered the most advanced and mature (Archer & Waterman, 1990; Berzonsky & Kuk, 2000; Côtè & Schwartz, 2002; Marcia, 1966; Waterman, 1982) and has been associated with a strong differentiated and integrated sense of self (Papini, Micka, & Barnett, 1989; Perosa, Perosa, & Tam, 2002) , high self-esteem (Marcia, 1980), balanced thinking (Boyes & Chandler, 1992; Côtè & Schwartz, 2002; Marcia, 1966), reflexivity (Boyes & Chandler, 1992), and overall well-being (Waterman, 2007). Furthermore, individuals with identity achievement are more effective at making decisions (Kroger, 1993; Marcia, 1980) show levels of moral reasoning (Cauble, 1976; Marcia, 1980) have high motivation and autonomy (Berzonsky & Kuk, 2000; Côtè & Schwartz, 2002; Marcia, 1980; Orlofsky, Marcia, & Lesser, 1973) and are future oriented (Côté & Levine, 1983). Relationally, identity achievement individuals are more capable of engaging in intimate interpersonal relationships (Årseth et al., 2009; Craig-Bray, Adams, & Dobson, 1988; Marcia, 1980; Orlofsky et al., 1973) and tend to be more connected to their families and involved in their communities (Côtè & Schwartz, 2002; Papini et al., 1989; Perosa et al., 2002; Perosa & Perosa, 1993). Conceptually, this fits with the Eriksonian notion that a clear set of identity-related goals, values, and beliefs are advantageous because they serve as guidelines that facilitate decision-making (Bosch & Card, 2012; Schwartz et al., 2011). Thus, identity achievement individuals generally reflect flexible commitments from which meaningful interactions and relationships grow (Marcia, 1980).

Individuals in the moratorium status are in the process of exploration and, therefore, have not yet made commitments. This status is considered the typical transition phase that precedes identity achievement, although not everyone is able to transition to identity achievement (Kroger et al., 2010). Moratorium status is associated with high levels of autonomy (Marcia, 1966, 1980) and open-mindedness (Côté & Levine, 1983; Schwartz, 2001), as well as with an ability to generate alternatives for consideration (Berman, Schwartz, Kurtines, & Berman, 2001) in their approach to matters relevant to identity formation. Research indicates a generally stable self-esteem (Marcia, 1967), although it is also associated with high levels of anxiety and stress (Côté & Levine, 1983; Kidwell, Dunham, Bacho, Pastorino, & Portes, 1995; Marcia, 1980; Meeus, 1996; Oshman & Manosevitz, 1974). Without personal commitments, those in moratorium tend to exhibit low levels of community involvement (Côtè & Schwartz, 2002). Due to the high levels of stress and anxiety for this status, it may be short lived in transition to identity achievement for those who have to capacity for identity achievement (Marcia, 1980).

Unlike identity achievement, in which commitment occurs only after significant exploration, those in the identity foreclosure status make commitments without having experienced a time of exploration (Marcia, 1966). Those in the foreclosure status are said to have not yet experienced an identity crisis and often adopt facets of identity (e.g., religion) that are identical to their parents (Marcia, 1966). Identify foreclosure is associated with an authoritarian value system (Marcia, 1966, 1980; Marcia & Friedman, 1970) and a rigid resistance to change (Marcia, 1980). These individuals have close relationships with their parents that are relatively low in overt conflict (Marcia, 1980;

Perosa et al., 2002; Schwartz, 2001), but have a low capacity for forming intimate interpersonal relationships with peers (Årseth et al., 2009; Berzonsky & Kuk, 2000; Marcia, 1980; Orlofsky et al., 1973). Identity foreclosure is also related to a high need for social approval (Berzonsky & Kuk, 2000; Côté & Levine, 1983) that seems to lead to unreasonable expectations of themselves (Marcia, 1966) as well as self-consciousness (Papini et al., 1989), and struggles under stress (Marcia, 1966, 1980).

Lastly, the identity diffusion status includes individuals who have made no commitments and are not exploring alternatives for commitment. This status is related to the Eriksonian notion of "identity diffusion," which is the absence of identity-related goals, values, and beliefs (Erikson, 1968). Individuals in the identity diffusion status are conceptualized as not concerned with issues of exploration or commitment (Marcia, 1966). A diffused identity status is associated with low self-esteem (Schwartz et al., 2011), low motivation (Côtè & Schwartz, 2002), and a tendency toward dependence on others (Berzonsky & Kuk, 2000; Marcia, 1980). Further, those in the identity diffusion status tend to conform (Marcia, 1980; Toder & Marcia, 1973) and are at risk for depression (Marcia, 1980; Schwartz et al., 2011), drug and alcohol abuse (Lewis & Gouker, 2007; Schwartz, 2001; Schwartz et al., 2011), and a general lack of well-being (Côtè & Schwartz, 2002; Waterman, 2007). This status is also associated with a low capacity for intimacy within familial and interpersonal relationships (Årseth et al., 2009; Berzonsky & Kuk, 2000; Orlofsky et al., 1973; Papini et al., 1989; Schwartz, 2001). As such, identity diffuse individuals seem to lack of any cohesive identity structure.

Marcia (1966) conceptualized identity statuses within a developmental sequence such that identity achievement and moratorium represent later, more adaptive identity

statuses than foreclosure or diffusion and it was stated that time spend in these statuses could be fluid (i.e., moratorium is a transition phase that precedes identity achievement). A meta-analysis of 72 investigations on identity status among adolescents and young adults showed that most movement occurs during late adolescence (18-25) out of the diffusion and foreclosure statuses into the moratorium and achievement statuses. However, there were also relatively large proportions of individuals (approximately 49%) who remained stable in their original identity status over time (Kroger et al., 2010); this was especially true among those in the committed statuses (foreclosure and achievement), although there were also a small proportion of individuals (15%) who regressed in identity status movement over time. Taken in total, the results of the meta-analysis generally support Erikson's theory that identity formation is a progressive developmental process in which individuals move toward a more integrative, solid identity throughout their lifetime.

For almost 50 years, the identity status model has been the predominant framework from which to examine the outcomes of identity development and support for this model has been strong. A thorough review of 35 years of identity status research confirmed the model as a useful conceptualization of Erikson's theory (Berzonsky & Adams, 1999). Specifically, there was evidence of convergent and discriminant validity of identity status measures, support for a diffusion-foreclosure-moratorium-achievement developmental sequence, and significant differentiation between the statuses on measures of social, personality, and performance dimensions (Berzonsky & Adams, 1999).

However, the identity status model is not without criticism. Some researchers have questioned the extent to which the identity statuses sufficiently represent Erikson's

identity construct (Bertram Troost, de Roos, & Miedema, 2006; van Hoof, 1999) as well as the fact that the central tenets of this paradigm (exploration and commitment) are primarily intrapsychic processes. Thus, theoretically speaking, it could be argued that these processes are not necessarily connected to the social circumstances in which, according to Erikson, the identity is formed (van Hoof, 2001). Several researchers have argued that more attention needs to be paid to the connection between identity status and environmental factors that place significant emphasis on the relationship between an individual and his or her context (Bertram Troost et al., 2006). Despite these criticisms, the identity status paradigm continues to be used in current research of identity development (e.g., Breen et al., 2013; Crocetti et al., 2013; Laghi, Baiocco, Lonigro, & Baumgartner, 2013) and has sparked a new line of research into the social-cognitive processes associated with identity development.

Identity Styles

Berzonsky (1989) extended Marcia's research (Marcia, 1966; Marcia et al., 1993) by formulating a process model of identity "styles" that focuses on the strategies an individual uses to form an identity rather than the outcomes of identity formation. The identity styles model attempts to explain the social-cognitive strategies that individuals employ when engaging in, or avoiding, the tasks associated with constructing and maintaining a sense of identity. Berzonsky (1988, 1989) identified three identity-processing stylistic approaches to dealing with an identity crisis: informational, normative, and diffuse-avoidant. These three identity styles differ along quantitative (presence or absence of exploration) as well as qualitative (e.g., reasons for the absence of exploration) dimensions (Schwartz et al., 2011). Considerable research has revealed

that these identity styles are associated with different patterns of temperament, social-cognitive processes, and psychological adjustment.

An informational identity style characterizes those individuals who deliberately seek out and process self-relevant information before negotiating identity conflicts and forming commitments (Berzonsky, Branje, & Meeus, 2007). Individuals who prefer to use an informational identity style have reported a high level of commitment to their self-constructed identities (Berzonsky, 1992), and this style is positively related to extraversion, agreeableness, conscientiousness, openness to experiences (Dollinger, 1995), introspection (Berzonsky, 1993), self-reflection (Berzonsky & Luyckx, 2008), and self-determination (Soenens, Berzonsky, Vansteenkiste, Beyers, & Goossens, 2005). Further, the use of an informational style predicts effective life management skills such as the use of vigilant decision-making (Berzonsky & Ferrari, 1996), mature defense mechanisms (Seaton & Beaumont, 2011), and proactive and positive growth-oriented coping (Beaumont & Seaton, 2011; Seaton & Beaumont, 2008). Perhaps as a result of these effective ways of functioning, the use of this style also predicts a mature or balanced type of adjustment. For example, an informational style is positively associated with emotional intelligence (Seaton & Beaumont, 2008), psychological hardiness (Berzonsky, 2003), self-actualization (Beaumont, 2009), and wisdom (Beaumont, 2011).

However, individuals who report a normative process of identity development deal with identity conflicts and form commitments by internalizing and adopting prescriptions and expectations of significant others in a relatively automatic fashion rather than explore options on their own (Berzonsky et al., 2007). Like the informational style, individuals who use a normative identity style have reported high levels of identity

commitment (Berzonsky, 1992). This style is also associated with extraversion, agreeableness, and conscientiousness (Dollinger, 1995) but also low levels of openness to experiences and introspectiveness (Berzonsky, 1993). Further, this style is correlated with conservative, authoritarian, and racist socio-cultural views (Soenens et al., 2005). Potentially related to these qualities, the normative style is associated with a mixed pattern of adjustment. On the one hand, it is related to positive adjustment to college (Berzonsky & Kuk, 2000) and positive coping strategies such as active coping and planning (Beaumont, 2011), but it is also associated with self-rumination (Berzonsky & Luyckx, 2008), the use of avoidant coping (Berzonsky, 1993), and procrastination when making decisions (Berzonsky & Ferrari, 1996), and is negatively associated with cognitive aspects of wisdom (e.g., understanding life and human nature) (Beaumont, 2011).

Lastly, the diffuse-avoidant identity style described those who procrastinate and delay in dealing with identity conflicts and personal problems (Berzonsky et al., 2007). This process of dealing with identity formation is associated with low identity commitment and a ‘‘reluctance to face up to and confront personal problems and decisions’’ (Berzonsky & Kuk, 2000, p. 83). The use of this style also correlates with low agreeableness, conscientiousness (Dollinger, 1995), introspectiveness (Berzonsky, 1993), and emotional intelligence (Seaton & Beaumont, 2008), as well as high levels of neuroticism (Dollinger, 1995) and self-rumination (Luyckx et al., 2008). Further, the diffuse-avoidant style is associated with less adaptive functioning, including immature defenses (Seaton & Beaumont, 2011) and maladaptive coping strategies such as substance use, denial, and disengagement (Beaumont, 2011). With respect to

psychological adjustment, the use of a diffuse-avoidant style is negatively associated with self-actualization (Beaumont, 2009) and wisdom (Beaumont, 2011), and it is positively associated with psychopathology (Adams et al., 2001).

Berzonsky (1989) linked his concept of identity styles with identity status theory such that: (a) the identity achievement and moratorium statuses are associated with the informational style in that each involves a process of active exploration in the process of making identity-related decisions; (b) the foreclosed status and the normative style both involve the forming of identity commitments without the consideration of alternative possibilities; and (c) the identity diffuse status and the diffuse-avoidant identity style both entail the absence of identity-related commitments and the lack of concern with their development. Studies into these relationships have confirmed Berzonsky's hypotheses about the association between the process of identity formation and its outcomes (Berzonsky & Neimeyer, 1994; Streitmatter, 1993b).

Summary

Erikson's (1950) theory of psychosocial development, Marcia's (1966) identity status model, and Berzonsky's (1989) process model of identity styles are the most widely accepted frameworks for conceptualizing identity formation. As the more recent conceptualization of identity formation, the identity style model extends the identity status model and adds a process component to how one addresses new identity issues (Berzonsky & Adams, 1999). Moreover, identity style, as a customary way of addressing (or not addressing) life issues related to identity formation, transforms identity formation from a static, one-time event—as Marcia originally conceptualized it—into a dynamic process of constructing and revising one's sense of self, as Erikson (1968) intended it to

be. Characterizing identity in terms of one's typical problem-solving strategy, as is done in the identity style model, (e.g., "I tend to sort through alternatives") may also be more faithful to Erikson's dynamic view of identity than is characterizing identity in terms of past actions, as is done in the identity status model (e.g., "I have explored") (Schwartz, 2001). Taken together, these theories suggest that the process by which one explores various life roles and commits to expressed actions and beliefs contributes to, and extends beyond, the static outcome of the exploration and commitment process. Successful exploration and commitment are associated with solid identity formation and positive psychosocial outcomes whereas difficulty with exploration and/or commitment is associated with psychopathology and negative psychosocial outcomes.

Correlates of Identity Formation

As the aforementioned models suggest, there is considerable variability in the extent to which individuals are able to form a solid, stable, and well-integrated identity. Although empirical investigation into the specific factors associated with disturbances in identity formation is limited, there is evidence to suggest that risk factors at the individual, relational, and collective levels affect an individual's ability to form an integrated sense of identity. These factors, which include executive functioning abilities, gender, personality, attachment style, relationships with parents and peers, ethnicity, and religion, are thought to have a bidirectional effect on one's identity development. This is due to the dynamic nature of identity formation, which involves frequent synthesis of current environmental context with individual factors in order to maintain a sense of continuity within the self (Erikson, 1968).

Individual Factors

Individual factors implicated in identity formation are primarily concerned with one's ability to explore various belief sets and to commit to beliefs that best describe one's goals, values, religious and spiritual beliefs, and overall "life story" (Mcadams, 2006; Waterman, 1999). As previously stated, exploration and commitment are thought to be critical for identity formation (Marcia, 1966). The factors listed below, which include executive functioning abilities, gender, and personality, are thought to contribute to an individual's identity formation at the individual level. Difficulties in any of these areas are thought to affect an individual's ability to form a cohesive, integrated identity.

Executive functioning. Executive functioning refers to a constellation of complex cognitive processes that enable purposeful, goal-directed behavior (Stuss & Benson, 1986). Although there is no universally accepted definition of executive functioning (Budson & Kowall, 2011; Goldstein & Naglieri, 2013), cognitive processes often considered under the rubric of executive functioning include planning, abstract thinking, working memory, attention, inhibition of preponent responses, self-monitoring, self-regulation, and initiation of goal-directed behaviors (Baddeley, 1998; Budson & Kowall, 2011; Goldstein & Naglieri, 2013; Robbins, 1996; Stuss & Alexander, 2000). Erikson (1950) did not conceptualize the process of identity formation as being exclusively cognitive in nature, but he did emphasize the important role that cognitive processes play in the development of identity, noting the temporal relationship between identity formation and the development of executive functioning skills (Piaget, 1963). Similar to identity, the development of executive functioning is thought to begin early in

life and develop throughout childhood and adolescence and young adulthood (Goldstein & Naglieri, 2013).

Adolescence is a critical developmental period for both executive functioning and identity formation (Erikson, 1950; Piaget, 1963), coinciding with the continued development of the prefrontal association cortex and its subcortical white matter networks throughout adolescence (i.e., the teen years through early 20's) (Blakemore & Choudhury, 2006; Budson & Kowall, 2011). As adolescents become more capable of higher-order cognitive processes (i.e., abstract, multidimensional, planned, and hypothetical thinking) (Steinberg, 2005) they are able to engage in the exploration and commitment that is required for identity formation (Erikson, 1980). Thus, identity formation emerges mainly because the adolescent is experiencing a growing awareness of his or her own identity. This suggests that difficulties with executive functioning may affect identity; however, to date only one study has examined this relationship. A study of patients with Parkinson's disorder showed that their identity formation (assessed as "sense of self") correlated with their executive function skills (McNamara, Durso, & Brown, 2003). These findings provide preliminary evidence of a link between executive functioning and identity, at least among Parkinson's patients.

Gender. Theoretically, gender differences in identity formation are not expected (Bosch & Card, 2012) and empirical evidence does not strongly suggest gender differences (e.g., Kroger, 1997). However, there is disagreement in the existent literature as to whether the structure, process, and timing of identity formation are the same for both genders (Cramer, 2000). For example, research has shown that interpersonal relatedness or connectedness is a more integral aspect of identity development for women

whereas separateness and autonomy may be more associated with identity development for men (Hodgson & Fischer, 1979). In addition, issues of self-definition, separateness, and autonomy are seen as more important for men than for women (e.g., Hodgson & Fischer, 1979; Josselson, 1973; Patterson, Sochting, & Marcia, 1992) whereas, for female identity development, relational issues appear to be more important, although the direction of this relationship is unclear. Despite this, the distribution of males and females across the four identity statuses is statistically similar as is the timing of identity formation (Cramer, 2000) suggesting both genders have comparable developmental trajectories. In addition, a review of 30 years of identity formation research concluded that identity formation in males and females is highly similar in terms of questions of identity structure, domain salience, or developmental process (Kroger, 1997). In sum, research into the association between identity and gender suggests comparable timing of identity development, but there may be differences in the importance placed on specific facets of identity formation (e.g., family role) (Archer, 1989a; Streitmatter, 1993a).

Personality. Personality traits may also play a role in identity formation. Research on the link between personality and identity formation has focused on the Big Five traits: Neuroticism (i.e., the tendency to experience stress), Extraversion (i.e., the tendency toward positive emotionality and social dominance), Openness to Experience (i.e., curiosity, creativity, and imagination), Agreeableness (i.e., helpfulness, cooperativeness, and kindness), and Conscientiousness (i.e., orderliness, responsibility, and perseverance) (McCrae & John, 1992). These personality traits are related to both commitment and exploration, with Openness to Experience as a predictor of identity

exploration (Luyckx et al., 2006) and Conscientiousness, Agreeableness, and Neuroticism associated with identity commitment (Lodi-Smith & Roberts, 2007).

Relational Factors

Erikson (1968) conceptualized identity formation as a person-context interaction in which the society surrounding an adolescent plays an important role in recognizing, supporting, and helping to shape identity. Relational identity, as previously noted, refers to an individual's role relative to other people, including roles such as child, spouse, parent, co-worker, supervisor, and customer (Sedikides & Brewer, 2001). Thus, relational factors such as attachment style, parenting style, and peer relationships, that are thought to contribute to an individual's identity formation at the relational level and, by extension, their ability to form an integrated sense of identity.

Attachment. Our relational identity starts in infancy as with our role as child to our parents. The term "attachment," refers to an individual's expectations of relationship security based upon the internalization of child-parent interactions. Both identity formation and attachment involve the use of exploration as a central component (Årseth et al., 2009; Doumen et al., 2012). In attachment, this is seen when children leave the secure base of their parents to explore the environment (Brennan & Morns, 1997), which parallels the process of exploring new identity factors during identity formation (Marcia, 1966). As such, a secure attachment should increase the likelihood for using a more mature identity style (i.e. informational) and achieving higher levels of identity formation (i.e., identity achievement and informational identity style). This is supported by research showing an informational identity style correlated with secure attachment, whereas high scores for a diffuse-avoidant identity style were associated with loneliness and an

inability to form attachments (Doumen et al., 2012). Furthermore, scores for the achieved and foreclosed identity statuses were correlated with the secure attachment; whereas the moratorium and diffusion statuses were negatively correlated with the secure attachment style, though the latter findings were somewhat more tenuous (Årseth et al., 2009). Although longitudinal studies are missing, these cross-sectional studies support attachment style as a relational factor associated with an individual's overall identity formation.

Parenting style. Parenting style, the manner in which parents teach their children norms, values, behavior, and social skills (Deci, Eghrari, Patrick, & Leone, 1994), has also been shown to have a strong effect on adolescent identity formation. There is thought to be a relationship between parenting style and identity formation outcome (identity status) as well as the process of identity formation (identity style). Neglectful parenting is associated with a diffuse-avoidant identity style (Berzonsky, 2004) and these adolescents report low levels of emotional support and expressiveness (Adams, Berzonsky, & Keating, 2006; Dunkel, Papini, & Berzonsky, 2008) as well as minimal communication and disclosure from their parents (Berzonsky et al., 2007). Likewise, individuals in the diffuse and moratorium identity statuses reported feeling misunderstood by parents, whom they described as disapproving and disappointed (Marcia, 1980). In contrast, an authoritative parenting style (warm but firm parenting) is correlated with a normative identity style (Berzonsky, 2004); these adolescents reported family cohesiveness (Adams et al., 2006), open communication (Berzonsky et al., 2007), and emotional closeness with their parents (Dunkel et al., 2008; Smits, Doumen, Luyckx, Duriez, & Goossens, 2011). Similarly, adolescents in identity achievement or identity

foreclosure reported that their parents were loving and affectionate (Marcia, 1980). Informational identity style has also been associated with authoritative parenting (Berzonsky, 2004), although this relationship has been less consistent (Berzonsky et al., 2007; Smits et al., 2008). Despite these few contrary findings, the majority of evidence suggests that a more authoritative parenting style has a positive impact on adolescent identity formation (Beyers & Cok, 2008).

Peer relationships. Adolescence is a time when individuals transition from spending a lot of time with their parents to spending a lot of time with their friends (Quintana, Castaneda-English, & Ybarra, 1999; Steinberg & Morris, 2001). Attachment to peers is thought to influence both the exploration and commitment components of identity formation. Within the context of close peer relationships, individuals can explore their similarities and differences, strengths and weaknesses, likes and dislikes (Felsman & Blustein, 1999). Further, the sense of connection provided by these relationships may provide security and psychological support to the adolescent explorer that facilitates commitment to identity factors (Ainsworth, 1989; Berndt, 1996). During this time, peers are thought to provide the primary influence while parents are an additive influence (Berzonsky et al., 2007; Dunkel et al., 2008; Hill, Bromell, Tyson, & Flint, 2007; Meeus & Deković, 1995). Supportive conversations with both parents and peers facilitate the exploration of identity factors (e.g., religion) (Weeks & Pasupathi, 2010), with peers becoming increasingly important during later adolescence (McLean, 2005). Thus, peer relationships, particularly during adolescence, may be a key factor in identity development.

Collective Factors

There are many factors that influence the formation of an individual's collective identity, which is defined as identification with the groups and social categories to which an individual belongs and the attitudes that result from identifying with these groups (Sedikides & Brewer, 2001). Two significant contributing factors that integrate with individual and relational identity factors to form a cohesive sense of self will be discussed below, ethnicity and religion, as they are conceptualized to be of central importance to one's overall sense of identity (Marcia, 1966; Phinney, 1996). However, it is acknowledged that there are many more groups and social categories with which an individual can identify, such as sexual orientation, occupation, and nationality. As with factors at the other two levels of identity formation, difficulties with identification with groups and social categories thought to affect one's ability to form an overall identity.

Ethnic identity. Ethnicity, defined by the values, attitudes, and behaviors of one's culture of origin (Phinney, 1996), is one factor at the collective level of identity that individuals integrate into their overall sense of self. Identifying with an ethnic group allows individuals to form an identity by orienting their current place in their community within a larger historical context of ethnic traditions, including using the values of their ethnic background of inform decisions about exploration and commitment to identity issues (Takei, 1988). Moreover, the extent to which individuals have thought about and resolved identity issues concerning their ethnicity has been directly related to self-esteem (Phinney & Alipura, 1990). Looking specifically at the association of ethnic identity to overall identity formation, the research is sparse; however, one study showed that across ethnicities, an achieved identity status is associated with higher ethnic identity awareness

and positive feeling about one's ethnic group membership in instances when ethnic identity is salient (Yip, 2013). This latter finding may be of particular relevance to minorities as ethnic identity has been shown to be more salient for ethnic minorities (e.g., Asian-American, African-American, and Hispanic) than for Caucasians.

Religious identity. Religion is another basis on which an individual can choose to identify when forming an overall sense of self. Erikson (1958, 1965, 1968) emphasized that religion can play an important part in identity formation; for example, by offering explanations for existential issues, connections to society, and belongingness via the rites and rituals of faith (Hunsberger et al., 2001; Luyckx et al., 2006). Research on the relationship between religious conviction and identity status suggests that that (a) individuals in identity moratorium reported modest levels of religious doubt and lack of commitment, (b) individuals in identity diffusion reported stronger religious doubt and lack of commitment, and (c) individuals in the foreclosed status reported a religious commitment, generally accepting the religious teachings learned early in life (Hunsberger et al., 2009). Individuals in identity achievement reported little association with religion (Hunsberger et al., 2009), which is surprising given that identity achievement should be related to strength of religious beliefs (Marcia, 1966, 1980). However, another study (Markstrom-Adams & Smith, 1996) showed that an intrinsic religious orientation (religiosity that has been internalized and that is an end in itself) was associated with identity achievement, suggesting that, when internalized religious beliefs are considered, there may be a stronger association between identity achievement and religion. Conversely, when looking at extrinsic religious orientation, associations are stronger with the less mature diffusion identity status, which may be related to a lack of religious crisis

and exploration. This suggests that religion may be one factor of identity that individuals are more likely to accept without wanting to explore other options.

Correlates of Identity Formation: Summary

Contemporary theories of identity development posit that not all individuals are able to achieve solid identity formation (Berzonsky, 1989; Erikson, 1950; Marcia, 1966). However, there has been surprisingly little empirical investigation into specific factors at the individual, relational, and collective levels of identity that place one at risk for pathological identity formation. Some factors at the individual level that impact identity formation include gender (Cramer, 2000; Nurmi et al., 1997), personality (Berzonsky & Kuk, 2000; Luyckx et al., 2006), and higher-order cognitive functioning skills (Erikson, 1980), whereas factors at the relational level that impact identity include attachment style (Årseth et al., 2009; Wheeler, Adams, & Keating, 2001) and relationships with parents and peers (Adams et al., 2001; Nawaz, 2011). Ethnicity (Gunderson, 2009; Lieb, Zanarini, Schmahl, Linehan, & Bohus, 2004; Phinney, 1996) and religion (Hunsberger et al., 2001) are considered important factors at the collective level of identity that inform one's overall sense of self (Marcia, 1966; Phinney, 1996). Given that one's overall sense of identity is composed by the integration of factors the these levels, unresolved difficulties with identity development related to at least one factor at any level of identity may affects one's ability to synthesize these components into a complete whole, which is associated with negative psychological outcomes.

Adverse Outcomes of Pathological Identity Formation

A growing body of evidence suggests that individuals who report lacking a clear sense of identity are at increased risk for functional impairment and psychopathology

(Berzonsky & Kuk, 2000; Jørgensen, 2009). Specifically, research indicates that less mature identity formation is related to borderline personality disorder (Modestin et al., 1998), and substance use problems (Jones, Ross, & Hartmann, 1992; White, 2000), as well as eating disorders (Korzekwa, Dell, Links, Thabane, & Webb, 2008; Wheeler et al., 2001), low self-esteem and depression (Nurmi et al., 1997), academic difficulties and poor peer relations (Berzonsky & Kuk, 2000), and conduct disorders (Adams et al., 2001; Grilo, Becker, Anez, & McGlashan, 2004; Grilo et al., 2001). Three adverse outcomes of pathological identity formation (borderline personality disorder, substance use, and psychosocial impairment) are discussed in greater detail below.

Borderline Personality Disorder

Borderline personality disorder (BPD) is a severe psychiatric disorder characterized by a pervasive pattern of impulsivity, emotional instability, interpersonal dysfunction, and identity disturbance (Gunderson, 2009; Jørgensen, 2006; 2010; Lieb et al., 2004; Widiger, Frances, Warner, & Bluhm, 1986). It is associated with significant psychosocial impairment (Ansell, Sanislow, McGlashan, & Grilo, 2007; Nawaz, 2011) and psychiatric comorbidities, especially affective disorders, substance use disorders, and eating disorders (Gunderson, 2009; McGlashan et al., 2000; Meares, Gerull, Stevenson, & Korner, 2011; Shea et al., 2004; Spitzer, Endicott, & Gibbon, 1979; Walter et al., 2009; Westen, Betan, & DeFife, 2011; Zanarini, Frankenburg, Hennen, Reich, & Silk, 2004). Prevalence rates of BPD range from 1%-3% of the general adult population (Coid, Yang, Tyrer, Roberts, & Ullrich, 2006; Trull, Jahng, Tomko, Wood, & Sher, 2010) and up to 20%-40% of psychiatric populations (Korzekwa et al., 2008; Siever & Weinstein, 2009).

BPD is the psychiatric disorder most associated with pathological identity formation and is the only personality disorder for which difficulty with identity formation is a diagnostic criterion. Specifically, the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) defines identity disturbance in BPD as a "markedly and persistently unstable self-image or sense of self" (American Psychiatric Association, 2013, p. 664). Moreover, endorsement of the identity disturbance criteria has been shown to have a base rate of 26-32% in individuals diagnosed with BPD (Grilo et al., 2001, 2004; Johansen, Karterud, Pedersen, Gude, & Falkum, 2004). However, even this may underestimate the role of identity in BPD as theorists suggest that many of BPD symptoms can be viewed within the context of a disrupted sense of self. Individuals with BPD appear to experience their sense of self as dependent on the availability of important others (Siever & Weinstein, 2009). When these important figures are unavailable or rejecting, individuals with BPD can experience this as an invalidation of their sense of self. This leads to accompanying feelings of abandonment and severe emotion dysregulation that can include aggressive, impulsive, self-defeating and self-harming (e.g., suicidal) behaviors These behaviors may serve as survival tactics to maintain a cohesive sense of self (Stanley & Siever, 2010). As such, identity disturbance has been conceptualized as a core feature of BPD (Meares et al., 2011; Spitzer et al., 1979; Westen et al., 2011).

Studies using the identity disturbance criteria of BPD show that identity disturbance has a high positive predictive power in discriminating BPD from other psychiatric disorders (Jørgensen, 2006; 2010; Widiger et al., 1986; Wilkinson-Ryan & Westen, 2000), and may be associated with a more severe presentation of BPD (Meares et al., 2011). Furthermore, among individuals with BPD, those who report identity

disturbance consistently show less favorable psychotherapeutic treatment outcomes compared to those with less severe identity disturbance (Hull, Clarkin, & Kakuma, 1993; Yen, Johnson, Costello, & Simpson, 2009; Zanarini, Frankenburg, Hennen, & Silk, 2003). However, despite the importance of identity disturbance in characterizing BPD, only one study has directly examined the relationship between BPD and a traditional model of identity development (i.e., the identity style model). The study, which used a clinical interview to assess BPD diagnosis and a self-report measure of identity style, found that 59% of the BPD participants were classified as having a diffuse-avoidant identity style as compared to 12% of the non-personality disordered control group (Jørgensen, 2009) supporting the notion that BPD is related to deficits in the process of identity development. Taken together, the current empirical investigations into the relationship between identity disturbance and BPD appear to be in line with the theoretical conceptualizations of this relationship.

Substance Use

Substance use during adolescence is a widespread problem, with approximately 50% of adolescents in high school report having used illicit drugs and 70% report having used alcohol (Johnston, O'Malley, Bachman, & Schulenberg, 2012). Adolescents with problem substance use are being identified at increasing rates across all sectors of health care (Aarons, 2001), and nearly one in eight high school students (11.9%, 1.6 million) have already met the diagnostic criteria for a substance use disorder (National Center on Addiction and Substance Abuse at Columbia University, 2011). Furthermore, current research indicates that there may be a link between identity development during adolescence and substance abuse.

Consistent with conformity research, adolescents who are low in both identity exploration and commitment (i.e., identity diffused) tend to engage in the most substance abuse as compared to adolescents with more developed identities (i.e., those who had engaged in identity exploration and/or commitment) (Jones & Hartmann, 1988; White, 2000). Moreover, those who have begun to develop their identities by exploring and/or committing to personal identity choices may be less likely to engage in peer-initiated substance abuse because these behaviors may interfere with life goals and be inconsistent with burgeoning personal life choices (Bishop, Macy-Lewis, Schnekloth, Puswella, & Struessel, 1997; Dumas, Ellis, & Wolfe, 2012; Jones & Hartmann, 1988). However, without a set of personally-relevant values, beliefs and goals to direct life choices, adolescents who have yet to begin constructing a personal identity may acquiesce to others more readily and may make poor or uncalculated life decisions (Dumas et al., 2012; Jones & Hartmann, 1988).

Although problems may be experienced by individuals in each of the identity statuses (Christopherson, Jones, & Sales, 1988; Marcia, 1989), empirical evidence suggests that individuals with a diffused identity not only get involved in more problematic behaviors in adolescence but also continue them into adulthood (Adams, Ryan, Hoffman, Dobson, & Nielsen, 1984; Jones, 1992; White, 2000). Adolescents with a diffused identity have consistently reported higher levels of substance use than those with a foreclosed, moratorium, or achieved identity (e.g., Jones, 1994). For example, seventh graders with a diffused identity were more likely to use a variety of substances (i.e., cigarettes, chewing tobacco, alcohol, marijuana, cocaine, and inhalants) than their peers with a foreclosed identity (Bishop et al., 1997; Dumas et al., 2012; Jones &

Hartmann, 1988). This research is consistent with conceptualization of individuals who report identity diffusion being low in both the exploration and commitment (Marcia, 1966, 1980); substance use may alleviate the sense of meaningless associated with diffusion (Bourne, 1978; Chandler et al., 2003; Harter & Monsour, 1992; Jones & Hartmann, 1988; McLean, Breen, & Fournier, 2010).

With respect to motivations for substance use, youth with a foreclosed identity said they learned about substance use within the family, those with a moratorium status said they used substances out of curiosity, and those with a sense of identity achievement said they did it for fun. However, substance use among those with a diffused identity stemmed from boredom and stress (Chandler et al., 2003; Christopherson et al., 1988). This implies that social (e.g., peer) forces may be playing a key role in their decisions to engage in these behaviors. Given that adolescents who have made strides in developing a personal identity show particular resistance against peer conformity (Adams et al., 1984; White, 2000), it has been suggested that these individuals may engage in fewer risk behaviors than their less-identity-developed counterparts in the face of heightened peer group pressure and control (i.e., group characteristics that likely encourage members' involvement in risk behaviors) (Archer, 2008; Dumas et al., 2012; Waterman, 1999; White, 2000). Thus, overall, the prevalence of substance use during adolescence appears consistent with a hierarchical model of identity development in that those with less formed identities are more likely to experiment with substance use for reasons related to their identity development status (e.g., identity foreclosure and learning about substance use from within the family) than those with more formed identities, more clear goals, and aspirations.

Psychosocial Impairment

In addition to being linked with psychopathology, pathological identity formation has also been associated with increased social maladjustment (e.g., Bourne, 1978; Chandler et al., 2003; Harter & Monsour, 1992; McLean et al., 2010; Nurmi et al., 1997). Erikson (1968) tied the developmentally desirable outcome of identity formation with one's good judgment, sense of inner unity, and capacity of doing well. The idea being that having clearer and firmer convictions about one's beliefs, goals, and self-relevant standards makes it easier to persevere in the face of difficulties or temptations to change course and, thus, to achieve one's aims. In this way, greater stability in self-understanding would be expected to contribute to a greater sense of personal continuity and satisfaction over time (Berzonsky, 1992; Chandler et al., 2003). Indeed, this hypothesis is supported by research correlating the most mature process of identity development with successful coping with stress and anxiety and problem-focused coping (Archer, 2008; Berzonsky, 1992).

Conversely, having a less developed identity formation thought to be associated with poorer psychosocial functioning. Individuals with a diffused identity use poor problem solving, decision making, and coping strategies that often result in socially deviant behaviors (Modestin et al., 1998; White, 2000). For example, relative to the other identity statuses, those in identity diffusion demonstrate low cognitive integrative complexity, restrict their attention focus in interpersonal interactions, and tend to avoid facing personal problems (Jones et al, 1992). As a result, individuals in identity diffusion evidence less autonomy, self-esteem, and mature intimacy (e.g., Archer, 2008; Breen et al., 2013; Waterman, 1999; White, 2000). Similarly, having the least adaptive process of

forming an identity (i.e., diffuse-avoidant identity style) is related to poor peer relationships, academic achievement, and self-esteem, anxiety, emotional distancing, maladaptive decisional strategies, and depressive reactions (Dumas et al., 2012; Nurmi et al., 1997). Thus, there appears to be significant evidence for a relationship between the process by which an individual forms his or her identity, the identity outcome of that process, and the individual's ability to function within society.

Adverse Outcomes of Pathological Identity Formation: Summary

Pathological identity formation is associated with myriad negative consequences. A review of the literature outlining the outcomes associated with identity disturbance indicates that it may be a core feature of BPD, may indicate a more severe presentation of the disorder (Modestin et al., 1998; Schwartz et al., 2011), and may be a factor in substance use during adolescence (Dumas et al., 2012; Luyckx et al., 2006). Given the increased risk for psychopathology associated with pathological identity formation, it is not surprising that these individuals also report decreased well-being and significant psychosocial impairments (Archer, 2008; Berzonsky, 1990, 2003).

Discussion

General summary

The current review examined popular theoretical frameworks and existing empirical evidence on the processes and outcomes associated with typical and pathological identity formation. In order to do so, the review operationalized identity as a multidimensional integration of one's sense of self at the individual level (goals and beliefs), relational level (role relative to other people), and collective level (identification with groups and societal categories). Once identity was defined, the review discussed

contemporary theories of identity formation, including Erikson's (1950) theory of psychosocial development, Marcia's (1966) identity status model, and Berzonsky's (1989) process model of identity styles. This was followed by a discussion of correlates of identity formation at the levels of individual factors (e.g., cognitive functioning, gender, personality), relational factors (e.g., attachment, parenting style, peer relationships), and collective factors (i.e., ethnicity, religion) that affect an individual's overall, synthesized identity formation. Lastly, the review identified and discussed several psychopathological and psychosocial outcomes associated with pathological identity formation, including borderline personality disorder, substance use, and psychosocial impairment.

Identity, a construct that has inspired philosophers since the Greco-Roman era (Schwartz et al., 2011), is defined within this review as a multidimensional construct that encompasses self-definition at the individual level of goals, values, and beliefs as well as perceived roles within relationships and broader identification with social groups and categories (Sedikides & Brewer, 2001). Modern debate regarding identity development, however, stems from Erikson's influential book, *Childhood and Society* (1950). Within this book, Erikson proposed adolescence as the time when consideration of identity issues would be most prominent. He also suggested that failure to develop identity was associated with negative consequences (Erikson, 1950, 1968).

Two theoretical frameworks that have inspired research on the developmental trajectory and outcomes associated with identity formation, Marcia's (1966) identity status paradigm and Berzonsky's (1989, 1990) identity styles, both posit a that typical identity formation occurs as a hierarchy. In the case of identity status, an individual who

commits to a given career, ideology, or interpersonal style following a period of relatively intense exploration is categorized as having the highest identity formation (identity achievement*)* where as someone who is without identity commitments and who is not engaged in exploration (identity diffusion) is said to have the lowest levels of identity formation (Marcia, 1966, 1980). Within the framework of identity styles, an informational style represents the top of the hierarchy and entails a willingness to investigate multiple solutions to a given problem and to explore several options before committing to any one; the diffuse-avoidant style is considered to be the least mature identity style and is marked by the tendency to procrastinate and to make decisions on a situation-by-situation basis (Berzonsky, 1993).

Despite these established theoretical frameworks, research into the specific correlates of identity formation is relatively limited. As with most psychological phenomena, however, there is some suggestion that identity develops as a consequence of an individual's interaction with his or her environment. Factors implicated in individual identity formation that are thought to affect overall identity formation, include executive functioning performance (Erikson, 1980), gender (Cramer, 2000), and personality traits (Berzonsky, 2004; Côtè & Schwartz, 2002; Dunkel et al., 2008; Luyckx et al., 2006; Waterman, 2007). Furthermore, executive functioning, gender, and personality may interact with each other as well as with relational and collective identity factors to create a synthesized identity (Erikson, 1980).

Moreover, individuals are not raised in isolation; there exists a bidirectional relationship, for example, between a child's temperament and his or her ability to form secure attachments to caregivers (Vaughn & Bost, 1999). This, in turn, affects the

relationship with parents and peers (Årseth et al., 2009; Wiley & Berman, 2012) and thus, an individual's relational identity (i.e., perceived roles within relationships with others). Further, individual and relational identity are nested within collective identity, defined as broader identification with social groups and categories (e.g., ethnicity) (Sedikides & Brewer, 2001). Taken in total, disruptions in self-concept at any of these three levels of identity are thought to hinder an individual's ability to achieve more mature levels of identity formation.

Contemporary theories of identity development posit that some individuals experience disruptions in self-concept during at least one of the three identified levels (Berzonsky, 1989; Erikson, 1950; Marcia, 1966). Across studies, the lowest levels of identity formation (i.e., identity diffusion and a diffuse-avoidant identity style) are associated with negative psychological outcomes and increased social maladjustment (e.g., Berzonsky, 2004; Côtè & Schwartz, 2002; Dunkel et al., 2008; Jones & Hartmann, 1988; Waterman, 2007). Specifically, this inability to integrate the correlates of identity formation leads to significant psychopathology, such as BPD (Goth et al., 2012), as well as increased substance use (Jones & Hartmann, 1988; Nurmi et al., 1997), low self-esteem and depression (Berzonsky & Kuk, 2000; Nurmi et al., 1997), academic difficulties and poor peer relations (Berzonsky & Kuk, 2000; Wheeler et al., 2001), and conduct disorders (Adams et al., 2001; Wilkinson-Ryan & Westen, 2000). Given that these are significant problems that affect one's psychosocial functioning, it is important to be able to identify and characterize points at which pathological identity formation may occur.

Limitations of Current Research and Future Directions

The theories and research summarized in this review provide insight into factors at the individual, relational, and collective levels of identity that are associated with typical identity formation; negative outcomes of pathological identity formation are also reviewed. However, current research has several limitations that should be noted and addressed by future studies.

The first area for further exploration is the need for longitudinal studies of identity formation. Current research on identity is mostly cross-sectional and involves data collection at only one point in time. These studies have been informative in identifying correlates of the identity statuses, but have not provided insight into the antecedents or, largely, the consequences of pathological identity formation (Schwartz, 2005). Thus, longitudinal studies are necessary in order to fully map the course of identity development and to examine the social and contextual conditions associated with pathological identity formation as well as its relation to positive and negative life outcomes. Knowledge about the antecedents and consequences of pathological identity formation would provide critical information about the direction of the association between identity formation and psychological well-being (i.e., whether identity formation leads to increased psychological adjustment or whether positive mental health produces a coherent sense of identity) that will inform clinical interventions (Schwartz, 2005). It is important that identity intervention programs be based on precise understandings of how identity relates to behavioral and mental health outcomes.

A second area for future research is continuing and extending current work on the effects of social–cultural contexts, including family environment, gender, and ethnicity,

on personal identity (Adams et al., 1987; Adams & Marshall, 1996; Archer, 1992; Phinney & Rosenthal, 1992). Although identity research has begun to explore the ways in which identity is embedded in social and cultural contexts (e.g., Adams & Marshall, 1996; Cote, 2006), much of the research focuses on which socio-cultural factors are related to identity formation and not on how these factors are related (e.g., Archer, 1989a; Streitmatter, 1988; Van de Meerendonk & Probst, 2004). For example, the field would benefit from work clarifying the directional relationship between factors such as religion or familial relationships and personal sense of identity. Increased emphasis on external context is important for two reasons. First, context is a key component of both the identity status and identity style models, as well as a core concept of Erikson's theory of psychosocial development (Berzonsky, 1989; Erikson, 1950; Marcia, 1966). Second, understanding how identity is embedded in interpersonal, social, and cultural contexts is a necessary ingredient in the design of effective intervention programs (Markstrom-Adams & Spencer, 1994) and basic research studies (Côtè & Schwartz, 2002). Thus, knowledge about how socio-cultural factors affect identity formation will help to increase our understanding of the complex process of identity development.

Lastly, more research is needed on the role of executive functioning on identity development. Despite an emphasis on the role of cognitive processes in the formation of identity (Erikson, 1950, 1980), research examining this relationship has traditionally operationalized executive functioning as a unitary concept (e.g., Piaget, 1963; Protinski & Wilkerman, 1986) and not as the multi-dimensional construct suggested by recent advancements cognitive neuroscience research (Miyake et al., 2000). Executive functioning is now thought to refer to a diversity of complex cognitive processes (Budson

& Kowall, 2011; Goldstein & Naglieri, 2013) and assessing the role of specific executive functions using this multi-dimensional framework may provide researchers and clinicians with a more detailed account of the specific cognitive deficits associated with identity disturbance. Given that developmental psychologists have already developed promising interventions to aid executive functioning development in children (Diamond & Lee, 2011), increased knowledge about this relationship may be a useful target for clinical intervention. Cognitive intervention research has shown positive effects for both young and older adults following training on specific aspects of executive functioning, such as attentional control (Bherer et al., 2006; Kramer, Hahn, & Gopher, 1999), inhibition (Davidson, Zacks, & Williams, 2003), and task shifting (Kray & Epplinger, 2006). Moreover, because identity development does not end with its formation during adolescence (Sokol, 2009), it is hypothesized that interventions aimed at increasing executive functioning performance may allow individuals to further develop their identity, which will lead to increased positive outcomes such as increased self-esteem and psychological well-being (Vleioras & Bosma, 2005).

In total, our knowledge of the specific factors that contribute to the complex process of identity development will expand as these and other directions for future research are realized. Increased knowledge about the antecedents of pathological identity development will be important in identifying those who are at risk for pathological identity formation as well as developing evidence-based interventions aimed at minimizing the negative outcomes associated with not experiencing the typical identity development trajectory.

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