Searching for the Self: An Identity Control Theory Approach to Triggers of Occupational Exploration

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ABSTRACT. Identity control theory researchers have found evidence for two processes of identity development (identity defense and identity change) and have theorized a third process (identity exploration). College students ($N = 123$) self-rated as high or low in occupational identity certainty and importance received self-discrepant feedback to induce identity disturbance, and dependent measures of identity defense, identity change, and identity exploration were obtained. As predicted, high certainty about identity standards led to identity defense, while low certainty led to identity change. Although an interaction between certainty and importance was hypothesized to predict identity exploration, results showed that the two operated independently. Low certainty predicted exploration of additional occupational areas, whereas high importance predicted exploration of self, environment, and additional occupational areas.

Keywords: career identity, identity development

Career exploration, ably executed, is highly adaptive, both for individuals and the institutions that hire them. Research has shown that higher levels of career exploration are predictive of greater congruence between personality and occupation (Grotevant, Cooper, & Kramer, 1986), which is predictive of longer tenure and greater job satisfaction (Mount & Muchinsky, 1978; Villwock, Schnitzen, & Carbonari, 1976). Yet, most adolescents and emerging adults do not explore well, as evidenced by some rather discouraging facts: Most university graduates do not work in jobs related to their field of study five years following graduation; adolescents tend to stabilize in occupations in their mid to late 20s primarily because of financial and family obligations rather than because of satisfaction with their

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careers; 64% of workers would choose another career if they could start over; and the majority of workers feel they could have been more satisfied and productive if they had known how to make better career decisions (Lemme, 1999).

Although career exploration is a lifelong endeavor (even young children have a rudimentary sense of occupational identity, and adults revisit the issue throughout life), it is during late adolescence that a number of factors intersect to form a crucible for occupational identity development and career exploration (Grotevant, 1987). Cognitive structures for formal operational thought are in place, enabling adolescents to think flexibly about self and options. Individuation from the family encourages thinking about the self as a separate and unique person. Normative events such as high school graduation promote consideration of possible selves and financial independence. And last, exposure to new environments, whether work or university, challenges viewpoints and encourages development of new skills and selves (Grotevant, 1987). The most active explorers of identity are 18–21-year-olds (Adams & Jones, 1983; Archer, 1982), and 18–21-year-old college students are the most active explorers of occupational identity (Waterman, 1982). Given that college enrollment is at an all-time high, that nearly all high school students expect to attend college, and that two-thirds of all high school students go directly to college (Papalia, Olds, & Feldman, 2004), adolescent college students are an ideal population in which to study career exploration and development of occupational identity.

Theorists such as Cooley (1902/1956), Mead (1934/1956), and Erikson (1968) have long believed that development of the self is an interpersonal process. Erikson's fifth stage of psychosocial development, identity versus role confusion, is thought to be a period during adolescence of actively trying on new selves in the areas of ideology, personal relationships, and occupation (Kerpelman & Lamke, 1997; Markus & Nurius, 1986). Marcia's (1966) identity status paradigm operationalized Erikson's identity versus role confusion as presence or absence of crisis and commitment, with crisis conceived of as an active period of exploration leading to identity change or identity consolidation. However, as Bosma and Kunnen (2001) pointed out, Marcia's identity status model is not a developmental model, and empirical studies of identity development processes have been few. The present investigation seeks to examine some of the processes of occupational identity development using a promising new model, labeled *identity control theory* (Burke, 1999; Kerpelman, Pittman, & Lamke, 1997).

Identity Control Theory

Control theory is a general approach that states that within any self-regulating system, input is continually monitored and compared to a reference value via a mechanism called a comparator. When a discrepancy is observed between the input and the reference value, a disturbance is created, causing the system to produce output designed to reduce the discrepancy and, therefore, the disturbance. This

closed loop of control continues until congruency is achieved (Carver & Scheier, 1982). A common metaphor for control theory is the thermostat (Burke, 1991; Kerpelman et al., 1997). A thermostat's goal is to regulate temperature, allowing heat in a room to vary no more than a few degrees above or below a set point. When a thermostat detects a discrepancy between actual temperature and a set point, it negates the discrepancy by adding air to the room, restoring congruence. The thermostat then returns to its monitoring state until another discrepancy is registered.

Identity control theory posits a self-regulating negative feedback loop designed to negate discrepancies between identities and social feedback (Burke, 1991; Kerpelman et al., 1997). Primary components of the identity control system are the identity standard[1] (the self-definitions that form a particular identity), system inputs (interpersonal feedback in the form of reflected appraisals, as well as subsequent self-perceptions), system outputs (cognitions and behaviors), and a comparator mechanism (which monitors discrepancies between identity standards and system inputs). The system functions much like a thermostat, ensuring no more than a small amount of discrepancy between an individual's identity and others' perceptions of it.

According to Kerpelman et al. (1997), interpersonal feedback is transformed into a self-perception, which is contrasted via a comparator mechanism with input from an identity standard. If there is congruence between the identity standard and the self-perception, the identity control system remains in its monitoring state. If there is incongruence between the identity standard and the self-perception, the identity control system registers an error or disturbance, which causes distress and anxiety to the individual. The control system responds to disturbances in one of two ways. The system can produce behaviors that elicit new interpersonal feedback and, thus, new self-perceptions directly through cognitions. If social behaviors and cognitive reshaping both fail to restore congruence, the identity control system may correct the error by changing the identity standard itself (Kerpelman et al., 1997).

Behavior that discounts the feedback or that elicits new feedback may be thought of as behavior designed to defend one's self-perception and identity standard, which we have labeled a process of *identity defense*. Altering one's identity standard to match the self-perception is an outcome that has been labeled *identity change*. Two studies in the self-verification tradition provide evidence for identity defense and identity change. First, Swann and Hill (1982) showed that women who received self-discrepant feedback engaged in significantly more behaviors designed to defend their identities than women who received self-confirming feedback. Identity defense was evident in two types of behavior. First, women verbally questioned or refuted the feedback; second, women behaved in ways that exemplified their self-conceptions and undermined the feedback. Results also showed that strivings to defend identities insulated participants from self-rating change. A study by Kerpelman and Lamke (1997) showed that women who received

self-discrepant career identity feedback engaged in more verbal strivings to defend their identities than women who were low in certainty. Results also showed that women who were high in certainty about their career identity displayed less identity change than did women who were low in certainty.

Kerpelman and Lamke's (1997) and Swann and Hill's (1982) findings are consistent with identity control theory's proposition that discrepant social feedback causes identity disturbances that activate the identity control system, resulting in cognitive or social behavioral output designed to bring self-perceptions and identity standards back into congruence. Furthermore, this research provides evidence that when highly certain identity standards are threatened, the identity control system's output is likely to be identity defense, while threats to uncertain identity standards are likely to be met with identity change.

However, identity control theory also predicts a third identity process, exploration, which is thought to be initiated in response to identity disturbance with the goal of consolidating the identity standard by learning about, trying on, and receiving interpersonal feedback about possible identity standards (Kerpelman et al., 1997). As yet, no research has investigated (a) whether the identity control system initiates exploration in response to identity disturbance, or (b) which factors, aside from certainty, might moderate the response of the identity control system to disturbance.

Two theories offer insight into the first question, suggesting that interpersonal processes trigger exploration. From a symbolic interactionism perspective, Cooley (1902/1956) suggested that reflected appraisals form the core of the self, whereas Mead (1934/1956) proposed that the self emerges from conversations and role play with others. Ego identity theory also identifies social interaction as a mechanism for identity exploration, which can lead to identity change or identity consolidation (Erikson, 1968; Marcia, 1966; Meeus, Iedema, & Maassen, 2002). So we see a long tradition of theory and research indicating that reflected appraisals are related to exploration, providing support for identity control theory's proposition that exploration is triggered in response to discrepancies between identity standards and reflected appraisals.

What factors might moderate the relation between identity disturbance and identity control system output (i.e., identity defense, identity exploration, or identity change)? A study by Mullin and Hogg (1999) gives reason to look to certainty and importance as moderators. Their experiment with undergraduate students showed that when importance (i.e., the personal significance and value of a self-referent dimension) is high, uncertainty feels especially unpleasant, causing people to seek social feedback to reduce their uncertainty. Stated differently, low certainty paired with high importance produced a desire to seek social feedback. This study, in combination with evidence from Swann and Hill (1982) and Kerpelman and Lamke (1997), suggests an important role for certainty and importance in moderating the identity control system's output.

Based on a series of experiments by Pelham (1991), we can conceptualize certainty and importance as independent forms of investment in the self. Pelham's work suggests that certainty is "a belief about a belief" (p. 519) that emerges from a consensus of consistent and substantial evidence. Certainty, Pelham showed, leads to stabilization of the self and insulates the self from self-concept change. Importance, on the other hand, is defined as emotional and motivational investment in the self. A self-belief is thought to become important under several circumstances, including when the dimension is relevant to personal goals and ambitions (Pelham, 1991). Pelham found that importance was related to stability of positive self-beliefs, but was related to instability of negative self-beliefs.

On the basis of previous research just discussed, the present study sought to show (a) that exploration is a process triggered by identity disturbance, as hypothesized by Kerpelman et al. (1997); and (b) that certainty and importance moderate the relation between identity disturbance and identity control system response.

Hypotheses

Four hypotheses were generated. First, it was predicted that participants would experience an identity disturbance in response to negative, self-discrepant feedback, and that this disturbance would be evidenced higher levels of anxiety. Second, it was predicted that, on a continuous measure of identity defense, participants who were more certain about their identity standard would engage in higher levels of identity defense in response to identity disturbance, but those who were uncertain would engage in lower levels of identity defense; on a dichotomous measure of identity defense, it was predicted that participants who were more certain of their identity standard would engage in identity defense more often than participants who were uncertain. The third hypothesis stated that participants who were less certain about their identity standard would engage in identity change (a dichotomous measure) in response to identity disturbance more often than participants who were more certain. Last, on a continuous measure of identity exploration, an interaction between certainty and importance was expected such that, in response to identity disturbance, participants with lower levels of certainty but higher levels of importance regarding their identity standard would engage in higher levels of exploration; on a dichotomous measure of exploration, it was predicted that participants with lower levels of certainty and higher levels of importance would engage in exploration more often than other participants.

Method

Participants

Participants were undergraduates enrolled in an introductory psychology course at a large state university in the Midwest. Participants received course

credit for their participation. Participants averaged 18.64 years of age ($SD = .75$), and were predominantly women (61%) in their freshman year (88%). Sixty-four percent were Caucasian, 22% were African American, 7% were Asian, and 4% were Latino. Two-hundred and sixty-seven adolescents participated at Time 1. Of those, 236 (88%) agreed to be contacted for a follow-up study. Approximately 145 participants were contacted, and 134 were then scheduled for a Time 2 session, yielding usable data for 123 participants. Data from 11 participants were eliminated due to suspicion, loss of audio files, or because their top occupational choices were too vague to provide meaningful feedback.

Participants who returned for the second session did not differ from those who did not return in age, sex, or race, (all $ps = ns$), although those who returned were significantly more likely to be freshmen than those who did not, $t(243) = -2.19$, $p < .05$. Participants who returned also did not differ from those who did not return on occupational identity, certainty, environment exploration, self-exploration, intended-systematic exploration, explorational stress, or decisional stress (all $ps = ns$). However, those who returned did rate the importance of their career choice as less important than those who did not return, $t(243) = -2.29$, $p < .05$ ($M = 3.31$, $SD = 1.15$ for participants who did return; $M = 3.64$, SD $= 1.08$ for participants who did not return). On average, participants rated themselves pretty certain (48%) about their top occupational choice, and rated that choice as pretty important (55%). Few participants rated themselves as uncertain (8%) or rated their choices as unimportant (9%).

Procedure

Two-hundred and sixty-seven participants were initially recruited for a 45-min pretesting session (Time 1). Participants completed questionnaires that measured demographics, top occupational choice, certainty and importance of the occupational choice, career exploration, occupational identity, and career aptitude. The career aptitude test served two functions. First, it provided a source of valuable career feedback offered to participants during debriefing. Second, it established the experiment's cover story, in which participants were led to believe that, based on their responses to the career aptitude survey, researchers had determined whether they were suited to their top occupational choice.

A second, individual experimental session (Time 2) lasting approximately 45 min took place three weeks later. Following Swann's methodology (Kerpelman & Lamke, 1997; Swann & Hill, 1982; Swann & Predmore, 1985), an identity disturbance was created in the laboratory by giving participants self-discrepant feedback in which they were told that they were not well suited to their top occupational choice. Specifically, a researcher explained that she had reviewed the participant's career aptitude test, which showed a result of "45 out of 100, which is considered poor." She then read a prepared comments section that read,

> You appear to be somewhat ill-suited to your top occupational choice. The pattern you display indicates that your capabilities in this area are below average compared to others who have been successful in this career path. Although your interest in this occupation is high, your abilities appear to be an awkward fit with the field.

The researcher then handed participants the feedback sheet. The ensuing conversation between participants and researcher was secretly recorded for approximately 5 min. Conversations were later coded for identity defense. The researcher reacted to participants' questions and statements as neutrally and nondirectively as possible.

After the conversation was terminated, a behavioral measure of identity defense and exploration was delivered to participants. The researcher explained to participants that they would have a choice about how to spend the next 15 min of the experiment, and offered them a choice between learning more about their chosen career or about several other careers. The researcher then informed participants that before they engaged in their chosen activities, there were a few more forms to fill out that would help them make the most of the 15 min they would spend learning about careers. The researcher then administered a packet of questionnaires identical to those administered at Time 1 (except without the career aptitude test) to assess change from Time 1 to Time 2 in occupational anxiety, certainty, importance, occupational exploration, and occupational identity.

The session was terminated, and participants were debriefed. Participants were informed that the feedback they received was bogus. The necessity of the deception was explained, and, based on a process debriefing procedure recommended by Ross, Lepper, and Hubbard (1975), participants were asked to remind themselves of the falsity of the feedback during the next few weeks or whenever they thought about the experiment. Participants were probed for suspicion, and then received verbal and written results of the Self-Directed Search (SDS; Holland, 1994). Participants were provided with contact information for the university's career center and psychological services center, and thanked for their participation.

Measures

Demographics. Demographic data collected included age, year in school, sex, and ethnicity.

Identity standard. At both Time 1 and Time 2, occupational identity standard was assessed with the single fill-in item: "Please write the name of the occupation you are most interested in."

Certainty. The independent variable certainty was assessed using the focus subscale of the Career Exploration Survey (CES; Stumpf, Collarelli, & Hartman, 1983). The CES is a 59-item measure of career exploration processes, reactions,

and beliefs. Although the CES has not been used as widely as the Vocational Exploration Behavior Checklist (VEBC; Krumboltz & Schroeder, 1965) or the Vocational Checklist (Aiken & Johnston, 1973) to measure career exploration, it is superior in its ability to discriminate among several types of exploration processes (e.g., environment vs. self vs. frequency) through the use of subscales. Four studies ($N = 601$) conducted by Stumpf et al. (1983) with samples comprising graduate business students, career changers, and undergraduates demonstrated construct validity and test–retest reliability. Construct validity was demonstrated through a behavioral validation approach showing that a group of career changers (from academia to business, who had engaged in a four-week course in career exploration but had little formal business training) and business school students (who had a great deal of formal business education but less career exploration) displayed theoretically predicted, significantly different patterns of results on the CES over a four-week period of time. Eighty-five percent of groups tested had test–retest reliability coefficients of .75 or above (Stumpf et al., 1983).

For the purpose of this study, nine of the original 16 CES dimensions were used (focus, importance, decisional stress, explorational stress, environmental exploration, self-exploration, intended-systematic exploration, frequency of exploration, and number of occupations considered), yielding 33 items. All items were revised to measure future rather than past behavior, except for the items measuring certainty and importance, which were written to measure present beliefs. In a pilot study, a confirmatory factor analysis of the scales with data from 160 undergraduates enrolled in an introductory psychology course (the same pool from which participants were drawn for the present investigation) suggested a good fit to the original nine factors. The normed fit index was .94 and the relative fit index was .93, all ps $< .000$. Mean scores for each subscale were created and used in analyses.

The focus subscale (Stumpf et al., 1983) assessing certainty comprised five items, such as "How sure are you that you know the type of job that is best for you?" The 5-point Likert-type response scale ranged from 1 (*not too sure*) to 5 (*very sure*). In a pilot study conducted by the authors, Cronbach's alpha for the subscale was .89. For this investigation, Cronbach's alpha was .89 at Time 1 and .92 at Time 2. In addition, participants responded to a single item that asked, in reference to the occupation participants listed as their top occupational choice, "How certain are you that this occupation is the best choice for you?" The 5-point Likert-type response scale ranged from 1 (*not too certain*) to 5 (*very certain*). The correlation between the focus subscale and the single-item question was .63 ($p < .01$), indicating validity for the use of the Focus subscale as a measure of certainty.

Importance. The independent variable importance was assessed using the Importance subscale of the CES (Stumpf et al., 1983). The importance subscale comprised five items, such as "How important is it at this time to work in the occupation you prefer?" The 5-point Likert-type response scale ranged from 1 (*not*

too important) to 5 (*very important*). In a pilot study, Cronbach's alpha was for the subscale was .92. Cronbach's alpha at Time 1 and Time 2 for this investigation was .94. Again, participants responded to a single item that asked, in reference to the occupation participants listed as their top occupational choice, "How important is it to you to obtain a position in this occupation?" The 5-point Likert-type response scale ranged from 1 (*not too important*) to 5 (*very important*). The correlation between the importance subscale and the single-item question was .23 ($p < .01$), suggesting validity for the use of this subscale as a measure of importance.

Identity disturbance. Occupational anxiety was used as a check of the feedback manipulation, and was assessed using the decisional stress and explorational stress subscales of the CES (Stumpf et al., 1983). The decisional stress subscale is comprised of four items. An example item is "How much undesirable stress do the following cause you *relative* to other significant issues with which you are contending?" followed by "Deciding what I want to do." The 7-point response scale ranged from 1 (*insignificant compared to other issues with which I have been contending*) to 7 (*one of the most stressful issues with which I have had to contend*). In a pilot study, Cronbach's alpha for the revised subscale was .93. Cronbach's alpha at Time 1 for this investigation was .91. At Time 2, Cronbach's alpha was .90. The explorational stress subscale is comprised of three items. An example item is "How much undesirable stress do the following cause you *relative* to other significant issues with which you are contending?" followed by "Exploring specific jobs." The response scale for these items was identical to the scale for decisional stress. In a pilot study, Cronbach's alpha for the revised subscale was .84. Cronbach's alpha at Time 1 for this investigation was .84. At Time 2, it was .85.

Identity defense. Identity defense was assessed using one dichotomous behavioral measure (activity choice) and one continuous behavioral measure (audiorecorded conversations). First, following Swann's methodology (Kerpelman & Lamke, 1997; Swann & Hill, 1982; Swann & Predmore, 1985), identity defense was measured using audiorecorded conversations that occurred immediately after delivery of the feedback manipulation. Coders rated conversations for identity defense on a 7-point scale ranging from 1 (*disagree strongly*) to 7 (*agree strongly*) on (a) participant disagreed with the feedback (operationalized as not just being surprised by the feedback, but directly contradicting it), (b) participant struggled to make sense of the feedback (operationalized as effortfully trying to understand why self-discrepant feedback was given by arguing with the experimenter), and (c) participant wanted researcher to help him or her make sense of the feedback (operationalized as asking questions about the experimenter's qualifications, the validity of the assessment tool, and how the experimenter arrived at her conclusions). These three ratings were previously used successfully by Swann and Predmore to measure of identity defense.

High scores on the ratings indicated identity defense and low scores indicated lack of identity defense. Using intraclass correlation coefficients (Howell, 2002), two raters achieved an average of 80% interrater reliability across all three ratings prior to coding. Final reliability averaged .83; reliability was .86 for disagreed with feedback, .67 for struggled to make sense of feedback, and .96 for wanted help making sense of feedback, which was comparable to the average of 81% reliability achieved in previous research (Swann & Predmore, 1985). Disagreements between coders were resolved through discussion.

The second measure of identity defense offered participants a choice between "learning more about your chosen career, or learning more about several other careers." The first option (learning more about your chosen career) represented identity defense (coded 0). That is, if an adolescent received discrepant feedback regarding his or her career goals, further learning regarding the original career choice could reflect the adolescent's questioning the accuracy of the feedback. This behavior is an example of identity defense. The second option (learning more about several other careers) represented identity exploration (coded 1).

Identity change. Identity change was assessed by determining if there had been a change from Time 1 to Time 2 in participants' responses to the item "Please write the name of the occupation you are most interested in." Participants who changed their choice from Time 1 to Time 2 (e.g., changed from physical therapist to accountant) were thought to have engaged in identity change (coded 1), whereas participants who kept the same choice were considered not to have engaged in identity change (coded 0).

Identity exploration. Identity exploration was assessed using two measures, including a continuous self-report measure and a dichotomous behavioral measure. First, participants were offered an activity choice between "learning more about your chosen career, or learning more about several other careers" (see the behavioral measure of identity defense).

Second, three CES subscales plus two single items (Stumpf et al., 1983) were used as continuous self-report measures of environmental exploration, self-exploration, intended-systematic exploration, frequency of exploration, and number of occupations considered.

The environmental exploration subscale is comprised of six items, such as "To what extent do you intend to behave in the following ways in the next 3 months?" followed by "Investigate career possibilities." The 5-point Likert-type response scale ranged from 1 (*little*) to 5 (*a great deal*). In a pilot study conducted by the authors, Cronbach's alpha for the revised subscale was .91. In the present investigation, at Time 1 Cronbach's alpha was .91 and at Time 2 was .88.

The self-exploration subscale is comprised of five items such as "To what extent do you intend to behave in the following ways in the next 3 months?"

followed by "Reflect on how my past integrates with my future career." The 5-point Likert-type response scale ranged from 1 (*little*) to 5 (*a great deal*). In a pilot study, Cronbach's alpha for the revised subscale was .87. Cronbach's alpha at Time 1 for this investigation was .86. At Time 2, Cronbach's alpha was .87.

The intended-systematic exploration subscale comprised three items. An example item is "To what extent do you intend to behave in the following ways in the next 3 months?" followed by "Experiment with different career activities." The 5-point Likert-type response scale ranged from 1 (*little*) to 5 (*a great deal*). In a pilot study, Cronbach's alpha for the revised subscale was .82. In the present investigation, Cronbach's alpha was .70 at Time 1 and .77 at Time 2.

The frequency item asks, "On average, how many times per week do you intend to specifically seek information on careers in the next few months?" The 5-point response scale for was anchored by "5 or less and "21+."

The number of occupations considered item asks, "How many occupational areas are you investigating?" The response for this item is open-ended and truncated at 5.

Career aptitude test/cover story. The SDS (Form R, 4th ed.; Holland, 1994), is a self-administered, self-scored, self-interpreted career counseling tool that served as the career aptitude test, which established the cover story and provided feedback during debriefing. The SDS, which took participants about 20 min, consists of 120 *yes* or *no* questions about activities and skills, 72 *yes* or *no* questions assessing the appeal of particular occupations, and a rank ordering of six abilities.

Results

Hypothesis 1: Identity Disturbance

To test the hypothesis that self-discrepant feedback leads to identity disturbance, a paired-samples *t* test was conducted on occupational anxiety at Time 1 and Time 2. Contrary to predictions, there was not a significant increase in explorational stress, $t(121) = 1.41$, $p = ns$ (Time 1 $M = 3.47$, $SD = 1.35$; Time 2 $M = 3.33$, $SD = 1.36$). Decisional stress from Time 1 to Time 2 also did not differ significantly, $t(121) = 1.04$, $p = ns$ (Time 1 $M = 3.70$, $SD = 1.53$; Time 2 $M = 3.56$, $SD = 1.38$).

Hypothesis 2: Identity Defense

To test the hypothesis that higher certainty would lead to identity defense in response to self-discrepant feedback, two sets of analyses were conducted. First, correlations were calculated between ratings of identity defense at Time 2 (made from 5-min audiorecorded conversations) and certainty scores at Time 1. There was a moderately strong, significant correlation between certainty at Time 1 and

disagreed with feedback ($r = .45$, $p < .001$), such that higher levels of certainty were associated with more disagreement with the feedback. There was also a moderate correlation between certainty at Time 1 and struggled to make sense of feedback ($r = .23$, $p < .01$), such that higher certainty was associated with struggling more to make sense of the feedback. These results provide support for the hypothesis that certainty is associated with identity defense. The correlation between certainty and wanted help making sense of feedback was not significant ($r = .10$, $p = ns$). A point-biserial correlation was also conducted that showed a moderate, significant negative correlation between certainty at Time 1 and activity choice ($r_{pb} = -.34$, $p < .001$), such that higher certainty was associated with an individual's choosing to learn more about his or her chosen career, as predicted.

Second, a logistic regression analysis was conducted to test the relation between certainty of occupational choice and activity choice. Certainty at Time 1 was entered as a covariate and activity choice was entered as the dependent variable. The overall fit of the model for activity choice was excellent. The model tested was shown to be significantly different from the model without any predictors, $\chi^2(1, N = 123) = 13.32$, $p < .001$. The classification table showed that overall, the model was able to accurately predict the outcome 69% of the time. The model accurately predicted identity defense from certainty level 74% of the time, and predicted identity exploration from certainty 63% of the time. Higher levels of certainty were related to an individual choosing to learn about his or her own career, whereas lower levels of certainty were related to choosing to learn more about several other careers ($B = -.70$, $SE = .20$), $Wald(1) = 11.75$, $p < .001$. These results provide support for the hypothesis that certainty would lead to identity defense.

Hypothesis 3: Identity Standard Change

A logistic regression analysis was performed to determine whether uncertainty about occupational choice influenced adolescents to respond to self-discrepant feedback with identity change. Participants who changed their top occupational choice from Time 1 to Time 2 were coded as 1 and participants who kept the same choice were coded as 0. All variables were centered, and Time 1 occupational identity was entered in Step 1, Time 1 certainty and Time 1 importance were entered in Step 2, and the interaction between the two was entered in Step 3. The results of this regression showed that the model at Step 1 was significantly different from the model without any predictors, $\chi^2(1, N = 123) = 28.33$, $p < .001$. The classification table showed that the model successfully predicted absence of change in occupational choice from Time 1 occupational identity 91.7% of the time and was able to predict change in occupational choice 25.9% of the time, for an average of 77.2% correct overall ($\beta = 2.35$, $SE = 0.54$), $Wald(1) = 18.90$, $p < .001$. At Step 2, the model was shown to be significantly different from the model without any predictors, $\chi^2(2, N = 123) = 7.58$, $p < .05$. The classification table

showed that the model successfully predicted absence of change in occupational choice from Time 1 occupational identity 89.6% of the time and was able to predict change in occupational choice 40.7% of the time, for an average of 78.9% correct overall. High certainty was associated with absence of change in occupational choice, whereas low certainty was associated with change in occupational choice ($\beta = -0.89$, $SE = 0.35$), $Wald(1) = 6.38$, $p < .01$. Neither importance at Step 2 ($\beta = -0.02$, $SE = 0.24$), $Wald(1) = .01$, $p = ns$, nor the interaction between certainty and importance at Step 3 ($\beta = 0.11$, $SE = 0.28$), $Wald(1) = 0.16$, $p = ns$, were significant. These results provide support for the hypothesis that adolescents who are uncertain of their identity standard respond to identity disturbance with identity change.

Hypothesis 4: Exploration

The final hypothesis stated that adolescents who had higher levels of uncertainty about their occupational choice but felt it was very important to them would respond to identity disturbance with higher levels of identity exploration, while adolescents who had higher levels of uncertainty but felt it was not important would have lower levels of exploration. In addition, we predicted that regardless of level of importance, adolescents who had higher levels of certainty would engage in lower levels of exploration.

Two sets of analyses were conducted to test these hypotheses. First, five hierarchical multiple regression analyses were conducted, predicting Time 2 environment exploration, self-exploration, intended-systematic exploration, number of areas investigating, and number of times seeking information per week from certainty, importance, and the interaction between the two. Results (see Table 1) at Step 1 showed that, following identity disturbance, higher levels of certainty were related to investigating fewer occupational areas whereas higher levels of importance were related to higher levels of environmental, self-, and intended-systematic exploration, as well as to investigating additional occupational areas. At Step 2, the interaction between certainty and importance was not significant.

To test the hypothesis that certainty and importance would influence exploration as measured by activity choice, a logistic regression analysis was conducted to test the effect of certainty of occupational choice (a continuous variable), importance of occupational choice (a continuous variable), and the interaction between them on the outcome measure of activity choice (a dichotomous variable). The overall fit of the model for activity choice was excellent for certainty, but poor for importance and the interaction between the two. At Step 1, the model tested was shown to be significantly different from the model without any predictors, $\chi^2(2, N = 123) = 15.19$, $p < .001$. The classification table shows that overall, the model at Step 1 was able to accurately predict the outcome 69.1% of the time. The model accurately predicted identity defense from certainty 75.0% of the time, and

TABLE 1. Summary of Five Hierarchical Regression Analyses Predicting Time 2 Exploration From Time 1 Certainty and Time 1 Importance

Variable	Time 2: Environment exploration		Time 2: Self-exploration		Time 2: Intended-systematic exploration		Time 2: Number of areas investigating		Time 2: Number of times per week to seek information	
	B	R^2	B	R^2	B	R^2	B	R^2	B	R^2
Step 1										
Time 1: Certainty	.15		.12		.09		−.35***		−.06	
Time 1: Importance	.27**	.12	.26**	.10	.17†	.05	.18†	.09	.14	.02
Step 2										
Time 1: Certainty	.15		.12		.09		−.35***		−.06	
Time 1: Importance	.26**		.26**		.17†		.17†		.14	
Time 1: Certainty × Time 1: Importance	.10	.13	−.06	.10	.07	.05	.04	.09	.07	.02

†$p < .10.$ **$p < .01.$ ***$p < .001.$

predicted identity exploration from certainty 62.7% of the time. The Wald statistic also revealed a good model fit for certainty, $Wald(1) = 11.78$, showing that the standardized regression coefficient ($\beta = -0.76$, $SE = 0.22$) was significantly different from 0 ($p < .001$). Step 2 was not significant.

Discussion

The present investigation sought to replicate findings from identity control theory research by showing that social feedback triggers the identity control system to respond with identity change and identity defense. It also sought to extend identity control theory by testing whether the identity control system would react to identity disturbance with identity exploration, as theorized in Kerpelman et al.'s (1997) seminal article. In support of previous research (Kerpelman & Lamke, 1997; Swann & Hill, 1982), we found that in response to self-discrepant social feedback, participants who were highly certain of their identities responded with identity defense, whereas participants who were uncertain of their identities responded with identity change. We also extended identity control theory, providing some evidence that the control system reacts to social feedback not only with identity defense and identity change, but also with identity exploration. Certainty and importance were shown to be key moderators of the control system's output, with low certainty predicting exploration of additional occupational areas, and high importance predicting exploration of self, environment, and additional occupational areas.

The primary contribution of the present investigation is its ability to show that the identity control system does react to social feedback with exploration. Providing discriminant evidence for our theory, we did find, as expected, that participants whose choices were certain did not react to identity disturbance with exploration. Neither did participants whose choices were uncertain and unimportant, also as expected. However, we had also hypothesized that participants whose choices were uncertain but important would react with exploration. However, we found that certainty and importance operated independently, rather than interacting. We found that low certainty predicted exploration of additional occupational areas, whereas high importance predicted exploration of self, environment, and additional occupational areas. Participants who were uncertain of their occupational choice responded to identity disturbance by exploring additional occupational areas. Participants for whom their top occupational choice was important responded to identity disturbance by planning to significantly increase their levels of intended-systematic, environmental, and self-exploration, and by increasing the number of areas they were planning to investigate.

Low certainty and high importance were found to lead to identity exploration following identity disturbance created by delivery of self-discrepant feedback. But the nature of the exploration was quite different depending on the predictor. Perhaps the reason for these different reactions lies in the young adult's willingness

to accept the feedback. Low certainty participants, who, by definition, are unsure if, for example, being an accountant is the right choice, and who, by inference, have not invested a great deal in committing to being an accountant, might be relatively willing to accept the negative, self-discrepant feedback. If little has been invested in trying to become an accountant, it may take little to be dissuaded from the choice. And if the young adult does accept that he or she will be a terrible accountant, the next logical step is to investigate other occupational areas, just as our participants did, according to behavioral and self-report measures.

Just like their low-certainty counterparts, high-importance participants responded to identity disturbance by investigating additional occupational areas. But they also responded by exploring themselves and the environment, reflecting on who they were as people, and seeking out information about jobs and opportunities. The difference may be rooted in high importance participants' greater resistance to accepting the feedback. Perhaps adolescents whose occupational choices are important to them are more emotionally invested in their choices (Pelham, 1991) than are those who are uncertain of their choices. This investment may make them less willing to let the dream go so easily. Yet although we cannot say their certainty is low, neither can we say it is high. And so this participant, who desperately wants to be an accountant, but is neither sure nor unsure of his or her suitability, responds to negative feedback by examining him- or herself and the world to see if he or she has indeed made a poor choice. And just in case the individual has, he or she builds a safety net by engaging the possibility of exploring new occupational areas that might be interesting and suitable. These questions are empirical and should be addressed in future research. The possible selves literature (Markus & Nurius, 1986) suggests another explanation. Markus and Nurius argued that possible selves are not well grounded in social experience and are, thus, especially vulnerable to changing in response to environmental feedback. Thus, it might be expected that any possible self, whether of high importance or low uncertainty, to be subject to change through exploration of new occupational possibilities.

Limitations

The results of this study are naturally limited in their generalizability. It seems reasonable to expect the processes discussed in the present study to operate in similar ways in the domains of ideology, interpersonal relationships, sex roles, and other identity domains. However, until similar research has been conducted in these domains using a similar paradigm, the findings of these studies cannot be applied to all areas of identity development. Related to theories of identity development, it is not known how these processes might work within the different identity style groups described by Berzonsky (1990) and Soenens, Berzonsky, Vansteenkiste, Beyers, and Goossens (2005). It could be that the process would work as predicted within participants primarily from the information oriented

identity group, whereas the process might work differently within persons from predominantly the normative oriented or the diffuse/avoidant groups (Soenens et al. 2005). Future researchers should investigate the identity control model within the context of three identity style groups.

The present research was also limited in its generalizability to multiple sources of social feedback. The source of the feedback in this investigation was a short encounter with a researcher. The researcher as the source of the feedback is naturalistic in that adolescents often receive social feedback from people with whom they have a limited personal relationship and who enjoy a position of authority over the subject matter of the feedback. Certainly guidance counselors, teachers and professors, and work supervisors all fit in this category. Yet it is easy to imagine that the most common, personally relevant, frequent, and enduring sources of social feedback are different in nature. Parents, siblings, and peers, whose relationships with a young adult are personal and less authoritative in any particular domain, constitute a different source of social feedback. Swann and Hill's (1982) findings that control theory principles are supported when peers are the source of feedback shed some light on this issue and suggest some generalizability of control theory principles to multiple sources of feedback. However, future researchers should investigate whether different sources influence identity processes in different ways. For example, does the strength of the identity disturbance change based on the source of the feedback? Do personal characteristics of the source, such as age, intelligence, personality, or experience influence identity processes? What are the effects of one-time feedback from a single source, of repeated feedback from a single source, and of repeated feedback from multiple sources?

Another limitation of the investigation is the use of first-year college students in the sample. It could be that career identity issues would be more salient to adolescents in the later college years, versus the early college years. Furthermore, the adolescents' ratings of certainty or importance might be less meaningful in this younger college sample than they would in an older college sample. Kerpelman and Lamke (1997) suggested that it is important to examine identity issues at the beginning of a transitional period. Thus, the adolescents who are transitioning to college might be the ideal sample for examining these processes because they are in the beginning stages of considering majors and careers. Nevertheless, future researchers should examine these issues across adolescents of varying ages in order to identify the developmental period when the career identity issues are most salient.

Last, perhaps the largest limitation of the present research was our inability to demonstrate that participants in fact experienced an identity disturbance. We found no increase in anxiety following receipt of the negative self-discrepant feedback. Although this null result could be the outcome of measurement error, nevertheless, it is impossible to know that the identity change, defense, and exploration participants engaged in was the result of the identity control system's negative feedback

loop. Related to this issue, all of the participants received negative self-discrepant feedback. Future researchers, in addition to the negative self discrepant feedback, should include two additional groups; those who receive feedback that they are well suited to their occupational choice and those who receive no feedback at all. Given this design of the investigation, it is impossible to rule out the possibility that college students are simply primed for exploration.

Directions for Future Research

One promising direction for future research on identity control theory is a close examination of the theory's terminology with an eye toward developing precise definitions of major constructs. Identity control theorists have used the term *process* to refer to three constructs: identity exploration, identity defense, and identity change. All three are discussed in the extant literature as processes instigated by the control system in response to disturbance. It is intuitive to think of exploration as a progression of actions in which information is gathered; defining defense as a series of actions that validate and confirm appears also to have good face validity; and it is possible to think of identity change as a process of shifting an identity from one standard to another. But we ask the following question: Is identity change is really a process? Is it, as Merriam-Webster (1990) suggested, "a natural phenomenon marked by gradual changes that lead toward a particular result"? Or is it better thought of as a result of a process? Perhaps it is better to think of identity exploration and identity defense as processes of the identity control system and identity change as an outcome of those processes. It might be better to think of defense as a process that results in a particular outcome: validation of the existing identity standard. Perhaps exploration is best conceived as a process that leads to one of two different outcomes: (a) validation of the existing identity standard or (b) modification of the existing identity standard (i.e., identity change). What constitutes a process and what constitutes an outcome of the identity control system are issues that future researchers should address.

Our difficulty in showing evidence of identity disturbance via an increase in anxiety illuminates a second area of interest for future research. It is possible that the measure of anxiety we employed may not have been sensitive to the momentary anxiety caused by identity disturbance. But it is also possible that identity disturbance is not always experienced as anxiety, as identity control theory suggests. From a possible selves perspective (Markus & Nurius, 1986), it is possible to imagine that negative, self-discrepant feedback about an identity standard encouraged by parents but not desired by participants might evoke relief more than anxiety, whereas the same feedback about a strongly desired ideal self might evoke emotions such as anxiety, fear, or anger. Self-discrepancy theory (Higgins, 1987) suggests that discrepancies between ideal and actual selves are experienced as dejection and frustration and that discrepancies between ought and actual selves

are experienced as agitation and resentment. Future researchers should investigate the emotional output of the identity control system and how it moderates control system responses.

Another critically important direction for future research on identity control theory is whether control theory principles are valid and applicable in non-Western cultures. One serious limitation of identity research in the Eriksonian tradition is that it has consistently been limited to studies of Caucasian, middle-class college students in the United States. Until control theory principles are tested in non-Western cultures, it will be impossible to understand how systematic and universal its principles are. In fact, there are a number of reasons to suspect that identity control theory may not be applicable in all cultural contexts. First, participants from collectivistic cultures, who are more accustomed to direct criticism (Wang, 2004), may require a greater discrepancy between identity standard and feedback in order to register an identity disturbance than do American participants. A second issue concerns the source of the feedback. Feedback may be understood differently by participants with dissimilar social histories. For example, negative self-discrepant feedback from a Caucasian researcher to an African American participant who has experienced a social history of domination and rejection by Caucasians may be experienced or reacted to differently than feedback received by Caucasian participants who have no such social history. Third, existing questionnaires for measuring identity that are normed on Westerners may not apply to people in other cultures, and may not be understood in the same ways. Researchers who desire to export identity control theory to other cultures must pilot test their methods and understand them from an emic point of view prior to delivering them in an experiment. Only by testing identity control theory in other cultures will its explanatory power and limitations be understood.

Conclusion

Identity development has been a well-studied topic for decades, and numerous theorists and researchers have made their names by contributing to our knowledge about how identity develops. Research from an Eriksonian perspective has taught us that identity is influenced by personality traits, parenting practices and styles, peer behaviors, and sociocultural contexts. However, as Bosma and Kunnen (2001) pointed out, Erikson's theory is not a developmental model and does not show us by what processes and mechanisms identity develops. The application of control theory to the study of identity development is a significant step toward an empirically testable model of identity processes, and a step away from the traditional study of identity predictors and outcomes. Although the present literature on identity control theory is limited to only a handful of studies, it demonstrates promise in illuminating the processes behind identity development.

NOTE

1. The literature to date has operationalized identity standards as traits (e.g., dominant vs. submissive in Swann and Hill [1982], and career oriented vs. not career oriented in Kerpleman and Lamke [1997]). The present investigation operationalized identity standard as a career role (e.g., accountant or nurse). An important task for future researchers will be to better define the term *identity standard*, clarifying whether it refers to personality traits, attributes, behaviors, or roles, and whether it refers to components, averages, or exemplars of identity. We thank an anonymous reviewer for bringing this issue to our attention.

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AUTHOR NOTES

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REFERENCES

Adams, G. R., & Jones, R. M. (1983). Female adolescents' identity development: Age comparisons and perceived child-rearing experience. *Developmental Psychology*, *19*, 249–256. doi:10.1037/0012-1649.19.2.249

Aiken, J., & Johnston, J. A. (1973). Promoting career information seeking behaviors in college students. *Journal of Vocational Behavior*, *3*, 81–87.

Archer, S. L. (1982). The lower age boundaries of identity development. *Child Development*, *53*, 1551–1556. doi:10.1111/j.1467-8624.1982.tb03478.x

Berzonsky, M. D. (1990). Self-construction over the life-span: A process perspective on identity development. *Advances in Personal Construct Psychology*, *1*, 155–186.

Bosma, H. A., & Kunnen, E. S. (2001). Determinants and mechanisms in ego identity development: A review and synthesis. *Developmental Review, 21*, 39–66. doi:10.1006/drev.2000.0514

Burke, P. J. (1991). Identity processes and social stress. *American Sociological Review*, *56*, 836–849. doi:10.2307/2096259

Carver, C. S., & Scheier, M. F. (1982). Control theory: A useful conceptual framework for personality-social, clinical, and health psychology. *Psychological Bulletin*, 92, 111–135. doi:10.1037/0033-2909.92.1.111

Cooley, C. H. (1956). *Human nature and social order*. Glencoe, IL: Free Press. (Original work published 1902)

Erikson, E. H. (1968). *Identity: Youth and crisis*. New York, NY: W. W. Norton.

Grotevant, H. D. (1987). Toward a process model of identity formation. *Journal of Adolescent Research*, *2*, 203–222. doi:10.1177/074355488723003

Grotevant, H. D., Cooper, C. R., & Kramer, K. (1986). Exploration as a predictor of congruence between adolescents and their career choices. *Journal of Vocational Behavior*, *29*, 201–215. doi:10.1016/0001-8791(86)90004-7

Higgins, E. T. (1987). Self-discrepancy: A theory relating self and affect. *Psychological Review*, *94*, 319–340. doi:10.1037//0033-295X.94.3.319

Holland, J. L. (1994). *The self-directed search, form R*. Odessa, FL: Psychological Assessment Resources.

Kerpelman, J. L., & Lamke, L. K. (1997). Anticipation of future identities: A control theory approach to identity development within the context of serious dating relationships. *Personal Relationships*, *4*, 47–62. doi:10.1111/j.1475-6811.1997.tb00130.x

Kerpelman, J. L., Pittman, J. F., & Lamke, L. K. (1997). Toward a microprocess perspective on young adult identity development: An identity control theory approach. *Journal of Adolescent Research*, *12*, 325–246. doi:10.1177/0743554897123002

Krumboltz, J. D., & Schroeder, W. W. (1965). Promoting career planning through reinforcement. *Personnel and Guidance Journal*, *44*, 19–26.

Lemme, B. H. (1999). *Development in adulthood* (2nd ed.). Boston, MA: Allyn & Bacon.

Marcia, J. (1966). Development and validation of ego-identity status. *Journal of Personality and Social Psychology*, *3*, 551–558. doi:10.1037/h0023281

Markus, H. (1977). Self-schemata and processing information about the self. *Journal of Personality and Social Psychology*, *35*, 63–78. doi:10.1037//0022-3514.35.2.63

Markus, H., & Nurius, P. (1986). Possible selves. *American Psychologist*, *41*, 954–969. doi:10.1037/0003-066X.41.9.954

Mead, G. H. (1956). *On social psychology: Selected papers*. Chicago, IL: University of Chicago Press. (Original work published 1934)

Meeus, W., Iedema, J., & Maassen, G. H. (2002). Commitment and exploration as mechanisms of identity formation. *Psychological Reports*, *90*, 771–785.

Merriam-Webster. (1990). *Webster's ninth new collegiate dictionary*. Springfield, MA: Author.

Mount, M. K., & Muchinsky, P. M. (1978). Person-environment congruence and employee job satisfaction: A test of Holland's theory. *Journal of Vocational Behavior*, *13*, 84–100.

Mullin, B. A., & Hogg, M. A. (1999). Motivations for group membership: The role of importance and uncertainty reduction. *Basic and Applied Social Psychology*, *21*, 91–102. doi:10.1207/S15324834BA210202

Papalia, D. E., Olds, S. W., & Feldman, R. D. (2004). *Human development* (9th ed.). Madison, WI: McGraw-Hill.

Pelham, B. W. (1991). On confidence and consequence: The certainty and importance of self-knowledge. *Journal of Personality and Social Psychology*, *60*, 518–530. doi:10.1037/0022-3514.60.4.518

Ross, L., Lepper, M. R., & Hubbard, M. (1975). Perseverance in self-perception and social perception: Biased attributional processes in the debriefing paradigm. *Journal of Personality and Social Psychology*, *56*, 899–906. doi:10.1037/0022–3514.32.5.880

Soenens, B., Berzonsky, M. D., Vansteenkiste, M., Beyers, W., & Goossens, L. (2005). Identity styles and causality orientations: In search of the motivational underpinnings of the identity exploration process. *European Journal of Personality*, *19*, 427–442.

Stumpf, S. A., Collarelli, S. M., & Hartman, K. (1983). Development of the Career Exploration Survey (CES). *Journal of Vocational Behavior*, *22*, 191–226. doi:10.1016/0001-8791(83)90028-3

Swann, W. B., & Hill, C. A. (1982). When our identities are mistaken: Reaffirming self-conceptions through social interaction. *Journal of Personality and Social Psychology*, *43*, 59–66. doi:10.1037/0022-3514.43.1.59

Swann, W. B., & Predmore, S. C. (1985). Intimates as agents of social support: Sources of consolation or despair? *Journal of Personality and Social Psychology*, *49*, 1609–1617. doi:10.1037/0022-3514.49.6.1609

Villwock, J. D., Schnitzen, J. P., & Carbonari, J. P. (1976). Holland's personality constructs as predictors of stability and choice. *Journal of Vocational Behavior*, *9*, 77–85.

Wang, Q. (2004). The emergence of cultural self-constructs: Autobiographical memory and self-description in European American and Chinese children. *Developmental Psychology*, *40*, 3–15.

Waterman, A. S. (1982). Identity development from adolescence to adulthood: A review of theory and an extension of research. *Developmental Psychology*, *18*, 341–358. doi:10.1037/0012-1649.18.3.341