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Work values system development during adolescence

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Abstract

Work values stability, change, and development can be appreciably reduced to a living system model (Ford, 1994). This theoretical model includes discrepancy-reducing and cohesion-amplifying mechanisms that interact to govern the change in standard- and goal-oriented work values over time (Boldero & Francis, 2002). Employing longitudinal data from a sample of adolescents ($n = 1010$) spanning the 9th through the 12th grades, the results demonstrate that the value system develops in a theoretically predictable fashion during the adolescent period. Discrepancy reduction and cohesion mechanisms interact to either maintain or increase the integrity of and harmony between standard-oriented values associated with high school part-time work experiences and goal-oriented work values related to anticipated career-oriented work during adulthood. Exploratory analyses suggest that adolescents' educational expectations influence the relative salience of standard- and goal-oriented work values and the discrepancy reduction process linking the two over time.

Keywords

Developmental-Contextual; Living Systems; Human Values; Work Values; Vocational and Career Development; Career Education; Career Guidance; Adolescence

Introduction

Although researchers have investigated the role of human values in vocational aspirations, choice, and development for more than 70 years (Dukes, 1955), our understanding concerning the development of work values has typically been limited to the use of cross-sectional data and by a small number of studies that have employed longitudinal data spanning more than two years of life (Cotton, Bynum, & Madhere, 1997; Johnson, 2001; Skorikov & Vondracek, 1997). Whereas Deci and Ryan (1985) and Eccles and colleagues (e.g., Eccles & Wigfield, 2002) have placed a great deal of emphasis on motivation in its intrinsic and extrinsic forms to understand, among other issues, academic performance during adolescence, this study seeks to examine a more durable and regulatory aspect of the motivation construct across the high school years, namely the value system.

Within vocational psychology, Super (e.g., 1957 e.g., 1990 e.g., 1992 e.g., 1995) has developed theory and conducted an extensive program of empirical research (Super, 1962, 1973, 1995; Super & Mowry, 1962; Super & Sverko, 1995) to demonstrate that work values play a critical role in career choices and career development processes alongside interests, needs, and the self-concept. Likewise, Brown (1996) has asserted that the work value system changes and

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develops through transactions between the person and the environment and that these transactions variably reinforce or suppress particular values. Moreover, work values presumably govern experience, yet experiences may serve to modify the salience of values over time (e.g., Brown & Crace, 1996; Rokeach, 1973). Both, Super and Brown identified the development of an accessible and stable value system as a critical milestone during the course of vocational development that supports the development of career aspirations and assists in career choice making and the transition from school to work.

The present study combines theoretical work from the human values (Boldero & Francis, 2002; Kluckhohn, 1951; Rokeach, 1973; Schwartz & Bilsky, 1987) and work values (Brown, 1995, 1996; Brown & Crace, 1996; Super, 1995) literatures with living systems (Ford & Lerner, 1992) and developmental systems theory (Ford & Lerner, 1992) to create and test a conceptual and propositional model of the work value system. The conceptual model suggests that work values act as durable (Hechter, 1993), yet changing and self-constructing (Ford, 1994), preferences that can be classified into standard- and goal-oriented work value analogues (Boldero & Francis, 2002). Standard-oriented work values serve as preferences engaged with immediate work opportunities and demands while goal-oriented values serve as preferences engaged with career-oriented behaviors and choices directed toward long-term career outcomes. The propositional model suggests that standard- and goal-oriented values are dynamically engaged with one another (Boldero & Francis, 2002) as parts of a human value system (Schwartz & Bilsky, 1987), which is a self-constructing part of a larger living and self-constructing human organism (Ford, 1994) that is embedded within multiple contexts (Ford & Lerner, 1992). Combining the conceptual and propositional model yields a theoretical model of the work value system as being composed of two value subsystems defined on the basis of present- and future-oriented demands and opportunities and engaged with one another in a dynamic fashion such that present-oriented values and behaviors and future-oriented values and behaviors dynamically influence one another across time.

A Conceptual Model of Work Values

Theorists like Super (1962; 1995), Kluckhohn (1951), Rokeach (1973), and Schwartz and Bilsky (1987) have identified a host of universal human values and work values and parsed the value system into two or more subsystems, classes, or domains. The most widely used value system typology has been Rokeach's (1973) instrumental versus terminal values distinction that divides the value system into two parts devoted to instrumental or *process-oriented* values and terminal or goal-oriented values. Recently, Boldero and Francis (2002) proposed that the value system is not composed of exclusive parts and is best modeled as a single, flexible system that is employed to guide present functioning (*standard-oriented* values) and future-oriented behavior (*goal-oriented* values). They contended that values can be conceptually classified into two categories according to their role in behavior maintenance and change by determining whether a value is employed as a standard maintaining current behavior (akin to instrumental values) or as a goal or life task (akin to terminal values) guiding behavior toward a desired end-state.

Although, at first blush, the standard- versus goal-oriented value distinction appears to be very similar to the long-standing instrumental versus terminal distinction, the two classifications are fundamentally different. Whereas Rokeach (1973) asserted that the value system has two mutually exclusive categories of values, Boldero and Francis (2002) proposed that any particular value may be employed in two unique ways to maintain present behavior or to direct a sequence of behaviors toward a goal. Essentially, the conceptual difference between standard- and goal-oriented values proposed by Boldero and Francis (2002) is akin to the difference between *being* and *becoming*. For a variety of reasons, a person may employ a value to *be* something quite similar to or different from what they wish to *become*.

A person may place a high value on “honesty” and wish to *become* an “honest person” as a life goal (i.e., goal-oriented value), but he or she may presently value deception to achieve a more immediate work goal, because *being* honest may be incongruent with current work demands. For example, if an employer expects their employees to negotiate the most lucrative deal possible, then employees may place a greater value on deception in their work situation but may continue to highly value honesty in their personal negotiations and long-term work goals. Although many people may not perceive or even be concerned with such a discrepancy between their present-oriented and goal-oriented work values, others may make career choices and changes as a means of avoiding or resolving such discrepancies.

A Propositional Model of Work Values Development

Super (1957; 1990; 1992; 1995), Brown (Brown, 1995; 1996; Brown & Crace, 1996) and others writing in the human values literature (Feather, 1990; Kilby, 1993; Kluckhohn, 1951; Rokeach, 1973; Schwartz & Bilsky, 1987) have clearly stated that values are organized into a dynamic system. Many of these researchers have supported this theoretical inference with cross-sectional research designs and data that demonstrated a predicted pattern of co-variation between conceptually-related and unrelated values.

The basic proposition of the theory pertaining to the value system (e.g., Kluckhohn, 1951; Rokeach, 1973; Super, 1995) suggests that value reinforcement and suppression are tied to the perceived discrepancy or incongruence between conceptually related values and between a value and an associated experience. Increased discrepancies are presumed to yield increased personal dissatisfaction and this dissatisfaction prompts behavior or value changes toward decreasing discrepancies and thus decreased dissatisfaction or dissonance. Furthermore, development is presumed to be indicated by increased stability and harmony within the value system across time and fewer and smaller discrepancies between conceptually related values and between values and experience. The notions of accessibility, stability, and harmony are often subsumed under the terms *values development* and *crystallization*.

Although much work has been done to determine whether or not and to what extent values are *structured* as a dynamic system (e.g., Schwartz & Bilsky, 1987), only a few published empirical studies have directly tested if and to what extent values *function* in the fashion of a dynamic system (Rokeach, 1973; Waller, 1994). These studies employed an experimental design and samples of college students to support the system-based proposition that a discrepancy between a preferred state (in this case values) and an actual state (other values or behaviors) prompts a change in either the preferred and/or actual state to decrease the discrepancy. Students who perceived a discrepancy between their values and choices or between their values and the values of their peers modified their values to reduce the discrepancy. This research was, however, limited to testing only one of several presumed mechanisms that promote and maintain the integrity of the value system. Furthermore, no research has been conducted to determine if the theoretically presumed mechanisms operate in a similar fashion during the high school years.

A dynamic systems theory applied specifically to human functioning and development has been articulated in recent years under the label of Living Systems Theory (Ford, 1994) and was further expanded to include complex formulations of human contexts to become what is now known as Developmental Systems Theory (Ford & Lerner, 1992). This theoretical model asserts that humans must be defined as self-constructing living systems that are in part defined by and in part define complex human contexts. Applying these theoretical models to the value system, the various dynamic relationships between values and experiences and the development of the value system across time can be described as consisting of within-person and person-within-context discrepancies and cohesion. A *developmental* change in values will theoretically lead to greater *stability* in the salience of values and increased *cohesion* and decreased *discrepancies* (i.e., harmony) between standard- and goal-oriented applications

(Ford & Lerner, 1992) of the value system. Value salience *stability* is defined as the absence of intraindividual or interindividual change in the salience of a value across a defined time period. Value system *cohesion* is defined as the degree of association, union, or harmony (e.g., correlation in the conceptual and statistical sense) between standard- and goal-oriented applications of a value. A value *discrepancy* is defined as the intraindividual difference between standard- and goal-oriented applications of a value. These three mechanisms spring from the well-supported conceptual and propositional models suggesting that values are organized as a dynamic system that is situated within a living system (Ford & Lerner, 1992) which is in turn embedded within a human ecology (Bronfenbrenner, 1979; Vondracek, Lerner, & Schulenberg, 1986).

Ultimately, value system development is indicated by its integrity, which can be defined by small discrepancies and strong cohesion between standard- and goal-oriented applications of the value system. Within well-developed harmonious value systems, the salience of a standard- and goal-oriented application of a value is predicted to be roughly equivalent (i.e., no discrepancy) and change in either the standard- or goal-oriented application of a value is predicted to yield a proportional change in the other application (i.e., high cohesion) (Oppenheimer, 1991a, 1991b). In simple terms, well-developed value systems will most likely exist in people who are presently *being* consistent with whom they wish to *become*. Moreover, people with highly developed value systems are more likely to *be* or function in a way that is consistent with present contextual contingencies or aim to change values and functioning in order to *become* consistent with anticipated opportunities and constraints in future contexts. The proposed mechanisms are, therefore, representative of the grand dynamic between person, context and time described within the developmental-contextual model of vocational development (Vondracek et al., 1986) and developmental systems theory (Ford & Lerner, 1992).

Testing a Theoretical Model of Work Values Development

The conceptual and propositional models combine to yield a theoretical model of work values development that incorporates the distinction between standard- and goal-oriented values and how these values serve to shape one another through discrepancy reduction and cohesion mechanisms. This theoretical model includes two conceptual manifestations of work values, namely standard- and goal-oriented values. These two value system classes are presumably engaged with one another within a propositional model governed by the cohesion and discrepancy reduction mechanisms. Previous research discussed below suggests that the two mechanisms operate within the value system, yet no research has been conducted to assess how the two mechanisms interact to govern the development of the work value system.

In previous research (Porfeli, 2004) as well as in the present study, adolescents were asked to report their values pertaining to present part-time work experiences and their values associated with their anticipated work experiences upon completion of their education. The standard-versus goal-oriented value distinction (Boldero & Francis, 2002) was employed to classify work values. Part-time work values (PTWV) during the high school years were viewed as standard-oriented values guiding present work choices and behavior. Full-time work values (FTWV) were considered to be goal-oriented values guiding future-oriented thought and vocational behavior consistent with the adolescents' anticipated future career.

The theoretical model of work values includes propositions suggesting that standard- and goal-oriented values should exhibit contemporaneous and ongoing cohesion. Previous research employing the dataset examined in the present study supported the cohesion mechanism because standard-oriented values (PTWV) exhibited moderate to strong cohesion (in the form of correlations) with their analogous goal-oriented values (FTWV) across the high school years (Porfeli, 2004). The interpersonal value domain exhibited the strongest standard- and goal-

oriented value cohesion followed by the mastery and economic security value domains, respectively.

Cohesion was not only indicated by within-wave relationships between standard- and goal-oriented reflections of a work value, but it was also indicated by relationships between cross-wave changes in standard- and goal-oriented values (Porfeli, 2004). The linear change (computed as a difference score (e.g., Time 2 – Time 1)) in standard-oriented mastery values from one grade to the next was, for example, associated with the change in goal-oriented mastery values during the same interval in the range of correlation equal to about 0.40. As adolescents' mastery values pertaining to part-time work changed, their mastery values pertaining to future full-time work changed in concert.

The theoretical model of work values also suggests that standard- and goal-oriented values should work in concert to minimize discrepancies (i.e., the discrepancy reduction mechanism) between the two value systems and should, in the face of a relative large discrepancy, exhibit discrepancy reduction across time. Previous research found that adolescents who exhibited relatively large discrepancies between a standard-oriented work value (PTWV) and its goal-oriented value analogue (FTWV) in the 9th grade demonstrated decreasing discrepancies (see the “large discrepancy” example in Figure 1) across 10th, 11th, and 12th grades (Porfeli, 2004). Furthermore, and contrary to the conclusion that this change was an artifact of regression to the mean, the discrepancy reduction from the 9th to the 10th grade was maintained or further reduced from 10th to 12th grade.

Given that previous research found that the cohesion and discrepancy reduction mechanisms appear to operate within the value system (Porfeli, 2004), the present study assessed whether or not the discrepancy and cohesion mechanisms within the propositional model interact or work in tandem to maintain system harmony. If discrepancy reduction and cohesion are fundamental mechanisms promoting value system harmony (i.e., development), then the relationship between the change in a part-time work value and its career-related analogue is likely to be different for people who exhibit large value salience discrepancies relative to those who exhibit small discrepancies.

On the one hand (and as reflected in Figure 1), small discrepancies between standard- and goal-oriented values are predicted to be generally maintained over time, while larger discrepancies will tend to be reduced over time because the latter prompts greater personal dissatisfaction than the former (e.g., Kluckhohn, 1951; Rokeach, 1973; Super, 1995). Furthermore, those adolescents who exhibit smaller discrepancies at an earlier occasion will presumably exhibit positive relationships between cross-wave changes in standard- and goal-oriented reflections of a work value (see “small discrepancy” examples in Figure 1). On the other hand, high school students who exhibit larger discrepancies between standard- and goal-oriented values at an earlier occasion are predicted to reduce the discrepancy over time and by necessity exhibit negative relationships between cross-wave changes in standard- and goal-oriented values (see the “large discrepancy” example in Figure 1). The difference in how values change over time as a function of the size of the discrepancy suggests that the cohesion mechanism is conditional upon the size of the discrepancy. In statistical terms, the relationship between the change in a part-time work value and its career-related analogue across time will be moderated by the magnitude of the discrepancy between a part-time work value and its career-related analogue at an earlier occasion (see Figure 2).

Method

Sample

Participants were randomly selected and recruited from the St. Paul (Minnesota) School District during the 9th grade and evaluated annually through the 12th grade as part of the Youth Development Study (YDS, Jeylan T. Mortimer, Principal Investigator). The Youth Development Study is based on an extensive longitudinal data collection effort that began during 1989, assessing 9th grade students from the St. Paul (Minnesota, USA) School District and has successfully followed them through the present day. The retention rate for the first four years of the study was 93% and through 11 years the retention rate was 72.4%.

Of the 1,785 9th grade students who were invited to participate, 1,139 (64%) consented, and of these 1,105 completed all aspects of the study during the wave 1 administration. Ninety-three percent of the panel was retained across all four years. Of this group of 9th grade students, the present study employs data from 1,010 participants (Hmong students (N=105) were omitted from these analyses because of language barriers and differences in data collection methodology). Mortimer, Finch, Shanahan, and Ryu (1992) found that the panel was representative of the student body of the St. Paul community at the onset of the study on a range of demographic variables. The St. Paul community, however, was different than the U.S. population on a few racial, economic, and educational indicators (Porfeli, 2004). These differences may limit the generalizability of the results of this study to populations similar to that of the St. Paul community.

Procedures

All of the data from the target variables employed in the present study were collected from the participants via a pen-and-paper questionnaire. The participants were granted the opportunity to complete the questionnaires in school during one of two scheduled administrations. Participants who were unable to attend either administration received and returned their completed questionnaires through the mail. Participants were compensated \$10 for their participation.

Measures

Part-Time (PTWV) and Full-Time (FTWV) Work Values—Participants were introduced to the topic of work values with the following text:

“When seeking employment, some students just try to find part-time work and do not care very much about the kinds of jobs they get. Others look for certain things in a job.”

Participants were then asked, “How important would each of the following be to you if you were seeking a part-time job after school or on weekends during this school year?” and provided with a series of work values listed in Table 1. Participants were then presented with the following stem, “What about when you finish school, and are out working full-time? How important would each be to you?” and the same list of work values. Students were asked to rate the work values with a four-point Likert scale ranging from “not at all important” to “extremely important.”

Each value construct (e.g., economic security, interpersonal, and mastery) was the sum of the identified items. The mastery, economic security and interpersonal part-time and full-time work value domains were examined with confirmatory factor analysis to determine if the value domains exhibited strict invariance (Conroy, Metzler, & Hofer, 2003; Wicherts & Dolan, 2004) across the high school years for each sex. The number, pattern, and size of the factor loadings, the mean of each factor, and the specific and random errors were all equivalent across

males and females in this study, thereby supporting the conclusion that the three value domains exhibit strict invariance (Porfeli, 2004). In other words, the aforementioned criteria support the conclusion that the longitudinal factor structure of mastery, economic security, and interpersonal values associated with part-time and full-time work identified above is invariant across sex during the high-school years.

PTWV-FTWV Discrepancy Scores—Discrepancies between PTWV and FTWV were computed by subtracting the PTWV construct score (e.g., part-time work mastery values) from the FTWV construct score (e.g., part-time work mastery values) for each participant. Given that the number of observed items remains constant between a PTWV domain and the associated FTWV (e.g., part-time and career-related mastery values), discrepancies tending toward the negative demonstrate that a participant places a greater value on the PTWV construct than the FTWV construct and positive values reflect the reverse. The absolute values of the discrepancies were employed in the moderator models because theory suggests that the *magnitude*, rather than the *direction* of the discrepancy should motivate changes toward smaller discrepancies and no discrepancies should motivate little or no change.

Results

Cohesion and Stability: Part-time and Anticipated Full-Time Work Values

Ordinary least squares regression models were employed to test whether the absolute value of a discrepancy between a PTWV and analogous FTWV moderates the relationship between the polynomial cross-wave changes in both across time (see Figure 2 for an example model). Models were estimated for the linear and quadratic polynomial trends and for the intervals spanning 9th to 12th and 10th to 12th grades.

The results (see Table 2) across all three value domains demonstrate that the PTWV polynomial trend (e.g., linear and quadratic) is associated with the FTWV polynomial trend from 9th to 12th grade. This relationship is moderate to strong in magnitude, and it is moderated by the absolute value of the PTWV-FTWV discrepancy during the 9th grade (Condition indices were no problematic collinearity among the predictors). Focusing on the mastery values domain as an example, Figure 3 depicts the strength and direction of the relationship between the PTWV and FTWV polynomial trends from 9th to 12th grade when the observed PTWV-FTWV discrepancy is low (0), moderate (3.5) and high (7). The top portion of Figure 3 demonstrates the association between the linear trends and the bottom portion depicts the association between the quadratic trends. Upon close inspection of the top portion of Figure 3, it is apparent that when the discrepancy is low, the association between the PTWV and FTWV linear trends is positive, which reflects cohesion that serves to maintain small discrepancies between the two over time. When the discrepancy is large, the association between the PTWV and FTWV linear trends is negative. This reversal in the cohesion relationship serves to decrease the discrepancy between the two values over time. This pattern of association at varying levels of the PTWV-FTWV discrepancy was observed across the mastery, economic security, and interpersonal values domains.

Although these analyses clearly support the proposed moderator model suggesting that the discrepancy reduction mechanism interacts with the cohesion mechanism, they do not clearly demonstrate if and to what extent the PTWV, the FTWV, or a combination of both tend to shift toward discrepancy reduction when the discrepancy between the two is large (e.g., $PTWV < FTWV$ or $PTWV > FTWV$). As a follow-up to this analysis, the participants were categorized into three discrepancy score groups (33rd and 66th percentile breaks) in order to contrast more extreme discrepancy groups. These percentile breaks were chosen arbitrarily, but recall that this analysis was not employed to test a hypothesis. This analysis was employed to simply generate means so that change over time could be graphically depicted for the extreme

discrepancy groups. Using RMANOVA, the discrepancy group data were employed to predict the change in PTWV and FTWV from 9th to 12th grade in order to depict how the PTWV and FTWV change when the discrepancy was either a large positive number (i.e., greater than the 66th percentile) or a large negative number (i.e., less than the 33rd percentile) during the 9th grade.

Before proceeding into the presentation of these results, they must first be qualified by the fact that the person-level PTWV and FTWV polynomial trends across the high school years are highly variable and these summary statements are certainly only one way to summarize the observed complexity of the actual trends. The averages for the PTWVs and FTWVs across time from the RMANOVA models are depicted in Figure 4 as a means of summarizing how adolescents tend to mitigate the discrepancy between a PTWV and FTWV.

Figure 4 demonstrates two clear trends concerning value change across time. First, all of the value domains tend to achieve discrepancy reduction in a similar fashion when the discrepancy is large. The tendency is to reduce the bulk of the discrepancy within one year via changes to both the standard- (PTWV) and goal-oriented (FTWV) reflections of the three value domains. Furthermore, initial reduction is either maintained or further reduced from 10th to 12th grade. It should be noted that the scale of the change may seem small, but these variables are on a standardized metric ($SD = 1$). For example, when the PTWV is greater than the FTWV within the mastery domain (see Figure 4) the PTWV decreased about 1/3rd of a standard deviation and the FTWV increased about 2/5th of a standard deviation from 9th to 10th grade. Second, when the discrepancy is large and the goal-oriented value (FTWV) is more salient than the standard-oriented (PTWV) analogue, the discrepancy appears to remain larger than when the reverse is true (the graphs on the left consistently demonstrate larger differences between PTWVs and FTWVs than the graphs on the right). All of these analyses were reproduced for the 10th to 12th grade interval and the results were consistent with those presented here, and in general, the r-squares between the 9th to 12 grade and 10th to 12th grade models were not meaningfully different (e.g., r-square difference of .03 to .05 for the linear trends) suggesting that the interactive mechanism operates and is not appreciably different from the 9th to the 10th grade.

As a follow-up to the latter finding, the relationship between a value discrepancy and educational expectations was examined during the 9th to 12th grades. The working presumption was that adolescents who hold their goal-oriented work values pertaining to their careers as more important than their standard-oriented values directed toward present part-time work may also aspire to more advanced educational degrees than those who place a greater value on standard-oriented values. Presumably, students who aspire to more advanced degrees anticipate a more delayed transition into their career, hence present work experiences may be much less important to them than they would be to students who expect a more imminent transition. Given the relatively small number of students who expected to earn less than a high school degree (approximately 1% of the sample at any given wave), these students were omitted from the following analyses.

Chi-square analyses were employed to determine whether or not students who aspired to more advanced degrees are over-represented in the group of students who rate their goal-oriented values as more salient than their standard-oriented analogues (i.e., a negative work value discrepancy). The results (see Table 3) across all four grade levels and across all three value domains support the assertion that adolescents who aspire to more advanced degrees are also over-represented in the negative discrepancy group and students who aspire to less advanced degrees are over-represented in the positive discrepancy group. Recalling that discrepancies were calculated by subtracting the goal- from the standard-oriented value (PTWV minus FTWV), positive values reflect that the standard-oriented value (PTWV) is more salient and

negative values demonstrate that goal-oriented values (FTWV) are more salient. Interestingly, the chi-square values increase across grade level for all three value domains. This suggests that these two groups of students demonstrate increasing differences as they approach the end of high school.

Both education groups also tend to make a shift in the shape of their respective distribution of discrepancy scores. Those students who expected to earn a high school or junior college degree tended to exhibit more positive than negative discrepancies during the early high school years. Their distribution tended to shift toward the reverse during the later high school years. The students who expected to earn a bachelors or graduate degree exhibited more of a normal distribution in discrepancies within the mastery and economic values in the earlier years and their distributions tended to shift toward a positive skew toward the later years. Within the interpersonal domain, both education groups exhibited a strong negative skew that shifted toward a positive skew in the later high school years. All of these results (not tabled) were replicated with analyses employing more refined educational expectation data that contained the following categories, "less than high school," "high school graduate," "junior college degree," "4 year college degree," "masters degree," and "Ph.D./professional degree." Students who expected to earn more advanced degrees exhibited the shift from positive to negative discrepancies at earlier grades than did the students who expected to earn less advanced degrees.

Discussion

Applying developmental systems theory (Ford & Lerner, 1992) to conceptual and propositional models derived from human (e.g., Boldero & Francis, 2002; Rokeach, 1973) and work (e.g., Super, 1995) value theories, the discrepancy reduction and cohesion mechanisms were presumed to operate to yield decreased discrepancies and increased cohesion between conceptually similar values, and the combination of these two mechanisms led to a testable interactive relationship. The results support the proposition that the discrepancy reduction mechanism moderates the cohesion mechanism (see Figures 2 and 3 and Table 2) and by extension, supports the conceptual model that proposes that the work value system is composed of standard- and goal-oriented value analogues. Consistent across all three value domains, the magnitude of the discrepancy between a standard-oriented value and its goal-oriented analogue moderates the association between the longitudinal changes in the standard- and goal-oriented values.

RMANOVA was employed to depict the nature of the change in conceptually-related values under the two possible large discrepancy conditions (see Figure 4). When adolescents exhibit large discrepancies between a standard- (i.e., PTWV) and goal-oriented (i.e., FTWV) manifestation of a work value (e.g., mastery values), the observed changes across the high-school years in the salience of both types of a work value suggest that the discrepancy mechanism is most active/influential within the first year following the discrepancy, but generally continues to be active for at least the following three years. The cohesion mechanism appears to operate to maintain a smaller discrepancy once the bulk of the discrepancy reduction is achieved. The validity of this presumed interactive process is bolstered by the fact that it was replicated across all three value domains and across the 9th to 12th grade interval and the 10th to 12th grade interval.

An alternate pattern emerged from the results when the discrepancy was large and the salience of the goal-oriented value (i.e., FTWV) was greater than the salience of the standard-oriented value (i.e., PTWV). In this case, the discrepancy between the standard- and goal-oriented values appeared to remain larger (not statistically tested) than under the reverse condition. Presumably, adolescents who rated their full-time work values as more salient than their analogous part-time work values made a greater distinction between part-time work

experiences and their future career than those adolescents who exhibited the reverse salience pattern.

Employing this presumption as the stimulus for some exploratory analyses, the results suggest that adolescents who plan to earn a more advanced post-secondary education tend to hold their goal-oriented values as more salient than their standard-oriented value analogues (yielding a negative discrepancy score) and adolescents who plan to earn less advanced degrees place a greater salience on their standard-oriented values (yielding a positive discrepancy score). In other words, high school students expecting to earn a less advanced educational degree placed a greater value on aspects of their present part-time work experiences than they did on analogous aspects of their anticipated full-time work experiences after the completion of their education.

Coupling this consistent difference in the salience of standard- and goal-oriented values with some of the results presented earlier (see Figure 4) suggests that students who expected to earn a bachelors or graduate degree also tended to value aspects of their anticipated careers more than their present part-time work experiences. Further, those students with this value pattern also tended to maintain greater discrepancies between their standard- and goal-oriented values and these discrepancy differences across educational expectation groups tended to become larger across the high school years. Students who expected to earn more advanced degrees (and logically a more delayed transition to formal full-time work) would also expect to enter more prestigious occupations after the completion of their education. Those would be further removed from the rather constrained set of experiences typically offered to adolescents in the part-time work setting, and therefore, these students would view and experience part-time work during high school as being more independent from their aspirations.

Combining all of the findings from the theoretically-derived and follow-up exploratory analyses suggests that educational expectations and the anticipated timing of a role exit (in this case the role of high school student) may have an impact on vocational development within the work values domain and this impact appears to become stronger as students approach the completion of high school and the transition to higher education or the world of work looms near. This inference is supported by the life course perspective (Shanahan, 2000) and empirical results (Shanahan, Porfeli, Mortimer, & Erickson, 2005) supporting the position that role transitions have an impact on human functioning and development.

A couple of fictitious case studies may serve to illustrate the conceptual and propositional models and the results supporting them. A 10th grade high school student named Isabella has a clear and durable sense of what she expects to value in her adult career because she has a clear sense of what work role and career she wishes to pursue. She further has a clear sense of what she values in the household and informal work she has performed in her community. Her values pertaining to the vocational roles she assumed at home and in her community are very consistent with what she values in her anticipated career. Isabella's standard- and goal-oriented work values are cohesive and not discrepant. She, like many of her high school friends, assumes a part-time job during the 10th grade that is consistent with much of the menial work available to adolescents and inconsistent with her standard- and goal-oriented mastery values. She further learns that the part-time labor market in general, and her job specifically, does not and will not afford the rewards and opportunities she values.

To cope with the discomfort borne from this discrepancy in the absence of any recognized opportunity to *be* what she wishes to *become*, Isabella adjusts her standard-oriented values in order to resolve the value-opportunity discrepancy. Unfortunately, such a strategy leads to a discrepancy in her value system. Over the next year, her standard- and goal-oriented values both change toward discrepancy reduction as a way of coping with the inflexibility of her part-

time work context. Unlike some of her peers who either did not have a well-developed work value system and/or expected a fairly delayed transition to the adult world of work, Isabella's values are fairly responsive to the discrepancy because they were fairly cohesive before she took a part-time job. Moreover, Isabella comes to value aspects of her part-time work that were originally of little importance to her as she begins to recognize and develop new competencies. Isabella's standard- and goal-oriented work values eventually achieve a personally satisfactory level of consistency as she approaches the transition from high-school to the adult world of work. Isabella, now 30 years old, reflects on her adolescent work experiences as a time when she "really learned" what she valued, on the one hand, and disliked, on the other, in the world of work. Moreover, she even recognizes in some small but meaningful ways how the nature and course of her adult career pathway was influenced by her part-time job during high school.

Turning now to a distinctly different adolescent, Nick had little exposure to or interest in the world of work prior to the high-school years and has no firm commitment to a career. Nick, like many older children, had a routine set of chores and did a few odd jobs to earn some spending money, but these vocational experiences had little meaning to him beyond the spending money that they afforded. Nick was a very good student and his parents and family would typically ask him, "What college are you planning to attend?" rather than if he was planning to go to college. When Nick sought out and acquired a part-time job, his main concerns were that the pay was "good" and the hours were "flexible." For Nick, his part-time job had little to do with his vague career aspirations and these, in turn, had little connection to Nick's talents and interests. Nick had little sense of himself during the high school years. He did not know who he was or who he wished to become and this was clearly reflected within his value system. His standard and goal-oriented values exhibited weak cohesion and large discrepancies. In the face of a part-time job that offered a fair hourly wage but few opportunities to *be* what he wished to *become* in his career, Nick exhibited little concern. Nick maintained weak value system cohesion and large goal- and standard-oriented value discrepancies through the high school to college transition and until his first internship during the summer of his junior year. During that experience, Nick faced and tackled value discrepancies in the manner similar to the strategy that Isabella employed years earlier.

Nick and Isabella are distinctly different in terms of their sense of self in relationship to work and the relative development of their value system. While Isabella's value system was quite responsive to work opportunities and constraints and to changes within the value system during the high school years, Nick's values were fairly unresponsive during the same period and only became responsive during the college years. Although both teens faced the same labor market constraints that most people their age face, the impact on the value system was very different for Nick and Isabella. This may have been due to a number of factors including Isabella having a much more salient and accessible value system and the pressure of a more imminent transition from school to work relative to Nick. The results of this study suggest that more developed value systems will be more responsive to value changes via cohesion and discrepancy reduction mechanisms and the timing of the transition into the labor market may have an impact on how responsive the value system is, with more imminent transitions prompting accelerated development.

Implications

Findings from the present study are consistent with previous research suggesting that the value system is composed of standard- and goal-oriented reflections of the work value system (Boldero & Francis, 2002; Porfeli, 2004) and that these value manifestations are linked to one another through cohesion and discrepancy reduction mechanisms (Porfeli, 2004). They further suggest that the integrity of the value system is maintained by the *interactive* influence of the cohesion and discrepancy reduction mechanisms. Larger salience discrepancies between

standard- and goal-oriented reflections of a work value prompt a shift toward smaller discrepancies which, in turn, prompts a change in the cohesion mechanism toward an inverse relationship between conceptually related values. These findings also suggest that disruptions to the value system that induce a discrepancy between conceptually related values activate the discrepancy reduction and cohesion mechanisms to operate in tandem to restore harmony within the value system across the high school years.

The results, therefore, support the conclusion that mechanisms maintaining the integrity of the value system are functioning during the high school period, particularly under conditions of large discrepancies, and the strength of the mechanism may be reflective of a more developed value system. In the face of a large discrepancy, adolescents exhibiting decreasing discrepancies and greater cohesion between standard- and goal-oriented values across time may be demonstrating more advanced value system development than those who exhibit weaker discrepancy reduction and/or cohesion mechanisms because the former groups is exhibiting greater harmony between standard- and goal-oriented values within the value system. The results also support the proposition that a fair amount of value system development occurs prior to the high school period, given that an established system of values is needed to identify and respond to large discrepancies and weak cohesion. Simply stated, without a relational network, value discrepancies and cohesion cannot influence value change and stability because they do not exist in the absence of a value network.

Clearly, the results also support the conclusion that value salience patterns - or in other words, the relative salience of a standard- and analogous goal-oriented value - have an impact on the salience discrepancy reduction process and may be influenced by the anticipated timing of the transition from school to work. The timing and/or nature of adolescents' anticipated role transitions appears to have a meaningful impact on the change and development of complex psychological processes like those associated with the value system. Future research could examine if and to what extent value salience patterns and/or the nature of value system mechanisms like cohesion and discrepancy reduction during the high school period predict actual (as opposed to anticipated) entry into and success in postsecondary education and the labor market.

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Large Discrepancy

Small Discrepancy (with little change over time)

Small Discrepancy (with positive change over time)

Small Discrepancy (with negative change over time)

Figure 1.
Predicted Trajectories of Conceptually-Related Values Over Time as a Function of their Discrepancy.

Figure 2.

Path Model of the Interaction of the Discrepancy and Cohesion Mechanisms.

*Absolute value of the discrepancy is used but the magnitude rather than the direction of the discrepancy is theoretically predicted to influence the value trajectories over time.

Figure 3.
Moderator Model of the Discrepancy and Cohesion Mechanisms for Standard- and Goal-Oriented Values.

Mastery Values: PTWV > FTWV **Mastery Values: PTWV < FTWV** **Economic Security Values: PTWV > FTWV** **Economic Security Values: PTWV < FTWV** **Interpersonal Values: PTWV > FTWV** **Interpersonal Values: PTWV < FTWV** **Figure 4.**

Mean Trend in Work Values across the High School Years under a Large Negative (< 33rd percentile) and Positive (> 66th percentile) Value Discrepancy using Standardized Data.

Interpersonal Domain: Mean Trend in PTWV and FTWV across the High School Years under a Large Negative (< 33rd percentile) and Positive (> 66th percentile) PTWV-FTWV Discrepancy using Standardized Data.

The x- and y-axis for each graph are on the same scale (standardized scores (SD= 1)) in order to permit a comparison of the relative magnitude of the initial discrepancy, the change toward discrepancy reduction, and the relative maintenance of a smaller discrepancy over time

Table 1
Conceptual Classification of the Work Value Items

Item	Work Values Construct
1. Good pay.	Economic Security
2. A steady job, with little chance of being laid off.	Economic Security
3. Good chances of getting ahead.	Economic Security
4. A chance to be helpful to others or useful to society.	Interpersonal
5. A chance to work with people rather than things.	Interpersonal
6. A chance to make my own decisions at work.	Mastery
7. A job where I have a lot of responsibility	Mastery
8. A job that uses my skills and abilities.	Mastery
9. A chance to learn a lot of new things at work.	Mastery

Table 2
Moderator Model of the Work Values System from 9th to 12th grades.

Mastery Values				
Outcome: FTWV – 9th to 12th grade linear trend				R-Square = 0.274
Predictor	Beta (β)	t-value	p-value	
PTWV – 9 th to 12 th grade linear trend	0.758	14.814	< 0.0001	
PTWV – FTWV 9 th grade discrepancy*	–0.011	–.375	NS	
Interaction	–0.337	–6.529	< 0.0001	
Outcome: FTWV – 9th to 12th grade quadratic trend				R-Square = 0.155
Predictor	Beta (β)	t-value	p-value	
PTWV – 9 th to 12 th grade quad. trend	–.492	–9.108	< 0.0001	
PTWV – FTWV 9 th grade discrepancy*	–.010	–.306	NS	
Interaction	–.133	–2.441	0.015	
Economic Security Values				
Outcome: FTWV – 9th to 12th grade linear trend				R-Square = 0.201
Predictor	Beta (β)	t-value	p-value	
PTWV – 9 th to 12 th grade linear trend	0.692	12.471	< 0.0001	
PTWV – FTWV 9 th grade discrepancy*	0.031	0.920	NS	
Interaction	–0.358	–6.168	< 0.0001	
Outcome: FTWV – 9th to 12th grade quadratic trend				R-Square = 0.131
Predictor	Beta (β)	t-value	p-value	
PTWV – 9 th to 12 th grade quad. trend	0.807	17.849	< 0.0001	
PTWV – FTWV 9 th grade discrepancy*	–0.081	–2.833	0.005	
Interaction	–0.360	–7.823	< 0.0001	
Interpersonal Values				
Outcome: FTWV – 9th to 12th grade linear trend				R-Square = 0.330
Predictor	Beta (β)	t-value	p-value	
PTWV – 9 th to 12 th grade linear trend	0.807	17.849	< 0.0001	
PTWV – FTWV 9 th grade discrepancy*	–0.081	–2.833	0.005	
Interaction	–0.360	–7.823	<0.0001	
Outcome: FTWV – 9th to 12th grade quadratic trend				R-Square = 0.293
Predictor	Beta (β)	t-value	p-value	
PTWV – 9 th to 12 th grade quad. trend	0.737	16.315	< 0.0001	
PTWV – FTWV 9 th grade discrepancy*	0.026	0.916	NS	
Interaction	–0.300	–6.603	< 0.0001	

* Absolute value of the discrepancy

Table 3

Relationship between Educational Expectations and PTWV-FTWV Discrepancies across the High-School Years.

Mastery Values			
9th Grade ($X^2 = 13.615$, $p < 0.01$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	29.4 (−1.5)		Positive
4-Year College Degree and beyond	37.4 (1.1)		26.9 (−0.8)
			43.7 (2.2)
			30.7 (0.6)
			31.9 (−1.6)
10th Grade ($X^2 = 23.34$, $p < 0.0001$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	28.6 (−2.1)		Positive
4-Year College Degree and beyond	40.0 (1.6)		24.8 (−1.0)
			46.6 (3.0)
			29.7 (0.8)
			30.3 (−2.3)
11th Grade ($X^2 = 25.808$, $p < 0.0001$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	23.3 (−3.1)		Positive
4-Year College Degree and beyond	38.9 (2.7)		35.0 (1.1)
			41.7 (1.9)
			29.1 (−1.0)
			31.0 (−1.7)
12th Grade ($X^2 = 57.95$, $p < 0.0001$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	18.8 (−4.5)		Positive
4-Year College Degree and beyond	42.9 (3.7)		32.5 (0.7)
			48.8 (3.8)
			29.1 (−0.5)
			27.9 (−3.0)
Economic Security Values			
9th Grade ($X^2 = 8.66$, $p < 0.05$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	31.6 (−1.5)		Positive
4-Year College Degree and beyond	39.9 (1.1)		27.1 (−0.3)
			41.3 (1.8)
			28.4 (0.2)
			31.7 (−1.3)
10th Grade ($X^2 = 29.63$, $p < 0.0001$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	29.2 (−3.0)		Positive
4-Year College Degree and beyond	46.0 (2.3)		27.3 (0.1)
			43.5 (3.2)
			26.9 (−0.1)
			27.1 (−2.4)
11th Grade ($X^2 = 40.03$, $p < 0.0001$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	26.8 (−3.4)		Positive
4-Year College Degree and beyond	45.5 (2.9)		25.1 (0.0)
			48.1 (3.4)
			25.3 (0.0)
			29.2 (−2.9)
12th Grade ($X^2 = 58.27$, $p < 0.0001$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	14.3 (−4.8)		Positive
4-Year College Degree and beyond	38.7 (3.8)		47.5 (1.3)
			38.2 (3.3)
			39.6 (−1.0)
			21.7 (−2.6)
Interpersonal Values			
9th Grade ($X^2 = 1.845$, NS)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	24.8 (−0.4)		Positive
4-Year College Degree and beyond	26.6 (0.3)		39.1 (0.9)
			36.1 (−0.5)
			34.4 (−0.6)
			39.0 (0.4)
10th Grade ($X^2 = 8.66$, $p < 0.05$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	31.3 (−1.8)		Positive
4-Year College Degree and beyond	41.3 (1.4)		31.6 (0.7)
			37.1 (1.3)
			28.4 (−0.5)
			30.3 (−1.0)
11th Grade ($X^2 = 10.35$, $p < 0.01$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	30.3 (−1.7)		Positive
4-Year College Degree and beyond	39.4 (1.5)		20.4 (−0.3)
			49.3 (1.7)
			21.6 (0.3)
			39.0 (−1.5)
12th Grade ($X^2 = 26.19$, $p < 0.0001$)			
Educational Expectations	Negative	Discrepancy Groups	Normative
High School and Junior College Degree	25.1 (−2.9)		Positive
4-Year College Degree and beyond	40.6 (2.3)		30.3 (0.1)
			44.6 (2.7)
			29.8 (−0.1)
			29.6 (−2.2)

The negative, normative, and positive discrepancy groups were defined by the 33rd and 66th percentile breaks for each grade and are consistent with the discrepancy groups employed in Figure 4. The value in each cell reflects the row percentage and the values in parentheses reflect the standardized residual from the chi-square analyses. Positive residuals reflect more people than expected by chance and negative values reflect less people.