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STABILITY AND CHANGE IN VALUES:
A META-ANALYSIS OF LONGITUDINAL STUDIES

BY

JING JIN

THESIS

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Adviser:

Professor James Rounds

ABSTRACT

A meta-analysis of longitudinal studies was conducted to investigate stability and change in values across the life span. Both rank-order stability and mean-level change were investigated for all four different value categories. Results of rank-order stability indicated that values are rather stable individual differences and that this level of stability increases as individuals age and reaches the peak during the latter part of emerging adulthood. Values possess a level of continuity similar to those of vocational interests and are more stable than personality traits. Mean-level results showed that intrinsic and social values are involved in the greatest changes in different directions across the life span, while extrinsic and status values are relatively stable. Emerging adulthood is the time period when dramatic normative changes take place.

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CHAPTER 1

INTRODUCTION

Values are widely viewed as critical to the selection of, and subsequent satisfaction with life roles (Dawis, 1991). For more than 70 years, researchers have investigated the role of human values in vocational aspirations, choice, and development, finding that values influence career and other life role decisions (Dawis & Lofquist, 1984; Judge & Bretz, 1992; Ravlin & Meglino, 1987). Value congruence between employees and organizations (Chatman, 1989; Ostroff & Judge, 2007) has been related to increased job satisfaction, identification with the organization, and reduced turnover intentions (e.g., Kristof-Brown, Zimmerman, & Johnson, 2005; Meglino & Ravlin, 1998; Verquer, Beehr, & Wagner, 2003). Values are often used with high school students and college students to explore occupations and to assist in their occupational choice process (Mortimer & Lorence, 1979; Rounds & Armstrong, 2005). The many uses of values in organizations and counseling generally assume that values are relatively stable.

Although by definition, values are considered to transcend specific situations and objects to guide human behaviors (Schwartz & Bilsky, 1987; Rokeach, 1973), experience and environment have been demonstrated to influence values to some extent (Feather, 1973). Controversy also exists in regard to when values become stable. For example, Ginzberg et al. (Ginzberg, Ginsburg, Axelrad & Herma, 1951) stated that values undergo several changes before finally stabilizing during late adolescence. Brim and Kagan (1980), however, have taken the position that values remain open to change throughout the life course. However, there has yet to be an integrated review of value stability and

change across the life span. The purpose of the present study is to understand the stability and change in values, when they become stable, and how they change before becoming stable, by conducting a meta-analysis of longitudinal studies of values.

In general, studies of value stability and change usually adopted two complementary approaches: rank-order stability and mean-level change. Rank-order stability refers to the relative placement of individuals within a group over time (Roberts, Walton & Viechtbauer, 2006), and is usually operationalized as a test-retest correlation. Mean-level change, on the other hand, refers to whether a group of people increases or decreases on certain value dimensions over time, it is also referred to as absolute change or normative change (Caspi & Roberts, 1999). Both rank-order stability and mean-level change have been demonstrated to provide unique information in understanding stability and change. In the present study, we quantify the relative magnitude and direction of value change from both perspectives. Since there are a variety of structures and measures in the field of values, it can be difficult to compare results across studies. In order to resolve the inconsistencies in categorization, we propose a common conceptual framework to integrate value measures across studies in the present study.

Value Classifications

Over the past several decades, values have been broadly studied by a variety of disciplines, including philosophy, sociology, political science, and psychology. Within the realm of psychology, Allport (1931) pioneered the study of values and provide the definition of value as “a belief upon which a man acts by preferences.” Along with other colleagues, he developed the first measure of values: Allport-Vernon Study of Values

(Allport, 1931). More recently, Rokeach (1973) has made contributions in advancing the investigation of the nature of human values and value systems. According to Rokeach, a value is an “enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end state of existence” (Rokeach, 1973, p.5). Rokeach (1973) further differentiated values into instrumental values (e.g., ambitious, independent) and terminal values (e.g., a comfortable life, social recognition). Dawis and Lofquist (1984) have extended the study of values to the work settings. In the Work Adjustment Theory (Dawis & Lofquist, 1984), they defined values as the “second-order needs”, a component of work personality. They proposed six value dimensions, which were organized into three sources of work environment reinforcers: Self (achievement and autonomy), Social (altruism and status) and Environment (safety and comfort). Super (1970) described values as intrinsic and extrinsic goals that motivate people to work. Schwartz (1992, 1994) provides the most comprehensive and up-to-date summary of the structure of values. Schwartz’s (1992) circumplex model not only categorized ten motivational types of values, but also specified the dynamic relations among those values in an integrated manner, showing the conflicts and complementarities among various value types. These ten universal human values could be further grouped into two bi-polar higher order dimensions: openness to change values (including self-direction, stimulation, and hedonism) versus conservation values (including security, conformity, and tradition); self-transcendence values (benevolence and universalism) versus self-enhancement values (power, achievement, and hedonism). This general structure has been supported in

samples from different cultures (Schwartz, 2005) and across different occupations (Koivula & Verkasalo, 2006).

Despite the many different value labels and measures, there seem to be some common constructs underlying the basic life and work values. Based on the theory of work adjustment (Dawis & Lofquist, 1984) and Schwartz's universal values (Schwartz, 1992), Ross, Schwartz, and Surkis (1999) developed a framework to capture the characteristics of both work values and basic life values. They claimed that there are four broad types of values that has been identified by most researchers: Intrinsic, or self-actualization values (including values such as personal growth, autonomy, interest, creativity, challenge, and intellectual stimulation etc.); Extrinsic, or security / material values (mostly related to the work aspects such as pay, security and work environment); Social, or relational values (relational component includes interacting with people, humanity component includes altruistic or contribute to the society); and Status, or power values (including prestige, authority, influence etc.). Similar structure has been provided by Lyons, Higgins and Duxbury (2009) in their investigation of work values, labeled as cognitive, instrumental, social /altruistic and prestige values. Hill, Burrow, Brandenberger, Lapsley and Quaranto (2009) have proposed similar categories in their study of four types of orientations toward life goals: creative, financial, prosocial and personal recognition. Because both life values and work values were included in the present study, we adopted Ross' categories of intrinsic, extrinsic, social, and status to organize values.

Stability and Change of Values

Katzell (1964) has pointed three characteristics of valuing process: hierarchy of values, which refers to the order and relative importance individuals place for different values; magnitude of values, which deals with the question of what level of value must be attained to maximally satisfy that value; intensity of values, showing if value is fulfilled, what degree of satisfaction could be attained. In general, studies of continuity and change are modeled according to two approaches: rank-order stability and mean-level change. In the area of value studies, rank-order stability corresponds to Katzell's hierarchy aspect, which refers to the relative standing or ordering of individuals' value preferences across time, and is usually indexed by rank-order stability coefficient (i.e., test-retest correlations); Mean-level change, on the other hand, represents Katzell's magnitude aspect of values, which refers to the mean importance of a value. The mean-level increase or decrease indicates whether the sample as a whole shifts up or down on a value measure over time, and is often measured by mean differences. The existence of rank-order stability does not rule out the possibility of mean-level change, in fact, both kinds of changes offer different lens through which we are able to get an all-rounded picture of value stability and change.

Rank-order stability and change is inherently associated with hierarchical nature of values. Rokeach (1973) and Schwartz (Schwartz & Bilsky, 1987; Schwartz, 1992) argued that personal values are ordered by relative importance, and the existence of value hierarchy is important for clarifying one's perceptions, attitudes and behaviors, and is especially crucial for helping people identify their priorities when competing values coexist. For example, individuals may hold the same set of values as important over the

life span, however, within each life stage individuals may set priorities for different values according to their experience, which consequently causes rank-order change over time. Schwartz and Bardi (1997) argued that value priorities are adaptive of opportunities within one's social and political environments, and are usually served as compensation for one's deprivations (such as an emphasis on security and material well-being). Johnson (2001, 2002) also noted that during the transition to adulthood, limited opportunities in the labor market constraint young people from holding equally high values for many rewards, therefore individuals gradually downgrade the importance attached to some values as a means to adjust to their occupational limitations and opportunities.

There are reasons to expect differing degrees of rank-order stability and change for values at different age periods. Studies of other individual difference characteristics, such as personality traits and vocational interests, have found a general pattern that rank-order stability increases with age (Roberts & DelVecchio, 2000; Low et al., 2005). Value researchers also suggest that young adulthood, such as high school and college year, is a life stage in which values are considered to be less stable than older ages (Alwin, 1994; Mortimer & Lorence, 1979). Dawis (1983), by describing an individual in terms of three behavioral development stages, pointed out that values would reach a stage of stability upon psychological maturity. Empirical longitudinal studies also provided evidence for this argument. For example, Johnson (2001) used data from a nationally representative panel study examining the change and stability in job values across the young adult years (from 17 till 31 years old). Her results showed that test-retest correlations of 7 consecutive two-year periods consistently increase with age for all four types of values. However, there is no general consensus in regard to when values stabilize. Mortimer and

Lorence (1979) integrated previous researches and proposed two models to account for value stability: the occupational-selection model and the occupational-socialization model. In the occupational-selection model, central values and motives are formed mainly in childhood and adolescence, people choose their jobs based on their existing traits, values, interests etc, and change during adulthood involves only minor and superficial aspects. This hypothesis has been thoroughly investigated and empirically confirmed (Rosenberg, 1957; Holland, 1976). On the other hand, the occupational-socialization model proposed that work experience may engender value changes over time and mold values during the transition to adulthood. Their empirical study provided support for both models: values in the senior year of college are predictive of work experiences 10 years later, while work autonomy and income have considerable impact of intrinsic and extrinsic values. Lindsay and Knox (1984) used a national longitudinal sample reconfirmed both selection and socialization effects. Results from dispositional trait such as personality has shown that stability peaks after age 50 (Roberts & DelVecchio, 2000); while motivational trait such as vocational interests is evidenced to become most stable at around 25-30 years old (Low et al, 2005). Since values share a closer pattern with interests in the sense that they are both considered as motivational traits (McAdams & Olson, 2010), we expect values to become stabilized at similar life period as vocational interests, which is during emerging adulthood after college at about 22-30 years old (Arnett, 2000). In addition, based on occupational-socialization model, we would also expect values to be open to change after emerging adulthood due to their work experience.

In comparison to rank-order stability, mean-level change is often linked with normative change, which is thought to be consequences of maturation process and societal or historical changes shared by a population (Helson & Moane, 1987). Maturation process is generally considered to have biological origin, indexed as general chronological age, and that a majority of the population would have similar experience during certain life period. Consistent with the biological and psychological maturation process, during the adolescence and early adulthood period when people are mainly undergoing education and training process, there should be a normative value change toward expanding the self and gaining more information. For example, Post-Kammer (1987) reported that 11th-grade students reported valuing intrinsic work values to a greater extent than did the 9th-grade students. Sheldon (Sheldon et al., 2003; Sheldon & Kasser, 2001; Sheldon, 2005) has studied value changes in adolescence and early adulthood, finding that liberal environment and opportunity for sophisticated thinking in college is not supportive of materialistic and extrinsic values but promotes the development of intrinsic values. Other researchers (Blomquist, Cruise, & Cruise, 1980; Feather, 1973; Hoge & Bender, 1974; Kuh, 1976) have also documented that the mean level of values for undergraduates shift as a result of their education and their academic major in the direction away from materialist and prestige-seeking values, and toward more intellectual, socially concerned, politically aware, and aesthetic values (Biddle, Bank & Slavings, 1990). Later on in the adulthood, developmental trends in traits and roles as a function of biological maturation would helps individuals to take on the social responsibility related to work, family and civic involvement (Costa & McCrae, 2006). As they are more inclined to focus on the careers, families, and material related concerns,

their values become more realistic and prudent, especially when they realize the limitation of resources within their environment (Ogilvie et al., 2001). Based on previous studies, we expect to find an increase in intrinsic values and decrease in extrinsic values during the adolescent and young adulthood period and an opposite direction in the middle to late adulthood.

Besides maturation, mean-level change could also be an indication of societal and historical changes. As Super (1995) pointed out, external changes in the labor market, social policy, and educational or promotional opportunities, can influence people to redefine what is important to them. Inglehart (1997, Inglehart & Baker, 2000) developed and modified the modernization theory arguing that economic changes result in value shifts. For example, Easterlin & Crimmins (1991) found that from early 1970s to mid-1980s, values of the youth have changed away from personal self-fulfillment and toward private materialism. Similarly, Cileli (2000) showed that change in value orientations of the youth toward individualism and competitiveness was associated with societal changes in Turkey. Accordingly, we would expect to see a cohort effect, with a rise in extrinsic values and a fall in intrinsic values from older generations to younger generations.

CHAPTER 2

METHOD

Literature Search

We conducted a literature search to identify both published and unpublished longitudinal studies that investigate the stability and change of values. We used several methods to locate the relevant studies. First, we searched in the PsycINFO and ERIC databases for journal articles and technical reports in the areas of psychology, sociology and education published between 1940s and 2009, using all possible combinations of the following keywords: value, change, stability, longitudinal, consistency, continuity, test-retest, work values, life values. Second, we searched in the ProQuest Dissertation Abstracts database for unpublished dissertations using the previous keywords. Third, we reviewed content pages of relevant journals (*Journal of Vocational Behavior*, *Journal of Counseling Psychology*, *Journal of Applied Psychology*, *Career Development Quarterly*, *Journal of Personality and Social Psychology*). Fourth, for retrieved articles, we further did a cross-reference check for additional studies cited in each article. Finally, we also checked the databases of several national longitudinal surveys such as National Longitudinal Study of 1972, National Education Longitudinal Study, Youth Development Study etc.

Inclusion Criteria

We included studies if they fulfilled four criteria. First, the studies we included must have the nature of longitudinal design. Cross-sectional studies were excluded from the present analysis. Second, at a minimum, each study needed to contain information on

sample size, age of sample, type of instrument used, test-retest interval, and a stability index: either in the form of rank-order correlation (i.e., Pearson's correlations, Spearman's rho, or Fisher's Z-transformed correlation), or in the form of mean-level change (i.e., mean and standard deviations of scale scores or t values). Studies that provided only percentages were excluded in the data analysis. Third, to reduce carry-over effects that could inflate estimates, we only included studies with test-retest intervals greater than or equal to half a year. Fourth, the studies must have been published in English.

Twenty-nine studies of rank-order stability and twenty-nine studies of mean-level change satisfied the inclusion criteria. Overall, studies provided a total of 88 rank-order stability coefficients, which consisted of 25,592 participants, and 103 mean-level stability coefficients that consisted of 15,168 participants.

Study Variables

Value Stability. As previously described, we examined value stability and change using both rank-order correlations and mean-level change. Both basic human values and work values were taken into consideration.

Age. Age information was recorded in a number of ways. For majority of studies that reported mean or median age, age at inception of each measurement period was coded. For studies that reported a range of ages (e.g., 18-20), the midpoints of the age ranges were used as estimates of age. Some other studies did not report age in numerical form but provided age-based descriptions of their samples (e.g., high school senior), for those studies, age information was recorded as the typical ages of members of these

demographic groups in the population. For example, high school students (from 9th to 12th year) would be placed in between 14-17 years old, and college freshmen would be recorded as 18 years old.

To allow comparisons with personality and vocational interests stability, we divided the period into five age categories based on previous studies (Roberts & DelVecchion, 2000; Low et al, 2005; Roberts et al., 2006), reflecting adolescence (ages 13-17.9), college years (ages 18-21.9), emerging adulthood (ages 22-24.9), young adulthood (ages 25-29.9) and adulthood (ages 30-52). A study was categorized into an age period by taking the midpoint between the age at the first assessment and the age at follow-up. For example, if a study first assessed individuals at age 20 and then again at age 30, the corresponding age information for this study was 25 and the data were categorized into the adulthood (25-29.9) category.

Test-retest interval. We selected studies that reported rank-order stability coefficient or mean-level change of half a year or longer. Interval was coded in number of years. For time interval that reported in months, the appropriate fraction of a year was included in the coding.

Cohort. We coded cohort by subtracting the age at the time of the first assessment from the year that the first assessment was conducted in each longitudinal study. When the first assessment dates were unavailable, we used the year of publication of the article as an estimate of cohort. Studies were assigned to one of eight cohort groups: 1930s, 1940s, 1950s, 1960s, 1970s, 1980s, 1990s and 2000s.

Value categories. Since both life values and work values were taken into consideration, there were a variety of different scales and inventories used in each study. Therefore, information of each scale category was coded separately. For example, there were six categories within the scale of A-V-L Study of Values: Theoretical, Economic, Aesthetic, Social, Political, Religious, and three categories within the scale of Super Work Values: Mastery, Economic Security, and Interpersonal. Stability coefficient of each category was recorded individually.

Each category was then assigned to one of the four upper-level value types (Intrinsic, Extrinsic, Social, Status) based on their content for aggregated analysis. For example, ability utilization, independent, creativity, learning were coded as Intrinsic; financial success, work environment, security, economics were coded as Extrinsic; helping other people, social relations, useful to society, working with people were coded as Social; prestige, advancement, power-control, authority were coded as Status. For categories that couldn't mapped into any of the four types, such as physical activity, salvation, religious et al., as well as other studies that reported only the overall stability coefficient rather than the information of each category (Thompson, 1966; Gribbons & Lohnes, 1965), they were excluded from the value type analysis but retained for overall value stability and change analysis.

Aggregation and Analyses of Effect Sizes

Since there are several studies published from the same longitudinal sample, in order to balance the optimization of the contribution of report results with the sample attenuation required for sample independence, we adopted the similar approaches that

previous meta-analysis of trait consistency and interests stability (Roberts & DelVecchion, 2000; Low et al, 2005; Roberts et al., 2006) used to aggregated effect sizes within each sample rather than within each study to see how value changes with age.

Effect size computation.

For rank-order stability, the effect size measure was test-retest correlation or stability coefficient, which is already a standardized index and could be transformed using Fisher's Z_r -transform (Hedges & Olkin, 1985). It is then weighed by the inverse of the variance when making population estimates, and transformed back into population correlations (ρ) through a Z -to- r transformation (Hedges & Olkin, 1985).

For mean-level change, we used the standardized mean difference as a measure of effect size, which was calculated by subtracting the mean of Time 2 value scale scores from the mean of Time 1 and dividing this raw mean difference by the standard deviation of the raw scores at Time 1. This approach is known as the single-group, pretest-posttest raw score effect size (Morris & DeShon, 2002; Roberts et al., 2006). In the present study, we chose raw score metric over change score metric (which could be derived by dividing the observed mean difference by the standard deviation of the change scores) because the change score metric incorporates the test-retest correlation into the estimate of the standardized mean difference. Therefore, difference scores based on data with high test-retest correlation are increased as a result of the strong correlation over time, and conversely decreased because of low test-retest correlation.

There are three reasons why we used the raw score metric. First, test-retest correlation is a direct function of the rank-order stability of the data, therefore using

change score metric as an indicator of effect size confounds rank-order stability with mean-level change. Since we would like to separate analysis of rank-order stability from that of mean-level change and only focused on the latter here, we used the raw score metric. Second, the raw score metric is standardized in the units of the original scale, which permits direct comparisons of standardized mean differences between two independent samples. What deserves notice is that, for raw score metric we also used test-retest information, but the usage is only restricted to standard errors of effect size estimates, rather than actual standardized mean difference score estimation itself. Specifically, the higher the test-retest correlations, the smaller the standard errors, therefore the more efficient the effect size estimations are, and vice versa. Finally, for raw score metric, we used the standard deviation from Time 1 alone, instead of pooled standard deviation of the raw scores at both time points because the repeated-measures design of longitudinal study make it impossible to calculate the exact degrees of freedom since the pretest and posttest samples are not independent, therefore a precise estimate of the sampling variance cannot be computed (Morris & DeShon, 2002).

The computation of mean difference scores was based on reported mean and standard deviation for 95% of the studies and inferred from F- or t-values in 5% of the studies using the formula from Morris and DeShon (2002).

Effect size aggregation.

To test the relation between value stability and age, we aggregated the dataset within the five age categories by age at the initial assessment of the study. We chose this approach rather than collapsing multiple waves of data across the life course into one

effect size because our focus was on the information from developmental trend. For studies that reported multiple waves of testing, we only included results from non-overlapping time intervals by averaging several effect sizes into that age category.

After aggregation within age categories, the next step of aggregation was within each value type. For studies that reported multiple effect sizes from the same sample for a particular age period that represented the same value type, they were averaged into one estimate of change. For example, for a sample that used the measure of Occupational Value Inventory, both “salary” and “security” subcategories could be coded into “Extrinsic” value type, therefore the two effect sizes of “salary” and “security” were aggregated to form a singular change estimate for “Extrinsic” value for that sample.

Moderator testing

We use two methods – a main-effects model and a random-effects model – to test for the effect of potential moderators. For the main-effects model, the data was first aggregated by value type; then within each value type, the effect sizes were re-aggregated according to each moderator (cohort standing and gender) separately. In that case, it is guaranteed that each sample could only contribute one averaged estimate of value change/stability to each category within each moderator. This approach permitted the test of the main effects these variables may have on effect size estimate. However, testing the moderating effects within each value category and moderator separately has several drawbacks. First, it will greatly reduce the power of detecting moderating effects due to small sample sizes in each cell. Second, the probability of making Type I error increases dramatically when multiple hypothesis tests are required. In addition, even when we

could conclude that men's values were, for example, more stable than women's, we still couldn't make a conclusion about the effects of gender differences on value stability/change across the age categories, because gender was not considered in the derivation of the age-based population estimates.

To test for moderators, we proceeded using the random-effects model (also known as mixed-effects model, Overton, 1998; Raudenbush, 1994). Within mixed-effects model, moderator variables were included simultaneously that we could test for the independent effect of each moderator while controlling for the remaining moderators. Therefore, mixed-effects model provided us with a more stringent test of moderators and help reduce the Type I error. The assumption of random-effects model permits population correlations to vary across studies, therefore beyond what we would expect on the basis of the moderator alone, the additional source of variation is accounted for by the estimation of possible residual heterogeneity within random-effects model. To test the moderating effects, we first estimated the amount of residual heterogeneity, then we tested the relationship between the moderators and the change/stability of values by fitting a weighted least squares regression model within each value category. The moderator testings were done using R "metafor" package developed by Viechtbauer.

We tested whether each moderator was significantly related to the effect sizes and whether residual heterogeneity was significant by calculating the homogeneity statistic, Q_E . An insignificant Q_E indicates that the effect size estimates are unlikely to be affected by other moderators beyond those included in the model. The method we used to fit the mix-effects model is similar to Low et al. (2005) and Roberts et al. (2006).

CHAPTER 3

RESULTS

Overall, 29 studies included in the meta-analysis of rank-order stability had a total of 25,592 participants and provided a total of 88 coefficients. For the mean-level change, 29 studies with a total of 103 coefficients and 15,168 participants were included.

Rank-Order Stability

Result for population estimates of rank-order stability within each value type across five age groups is displayed in Table1. From which we could notice that the trajectory of intrinsic, extrinsic and social values are quite similar. For all of them, college years (18-21.9) are the time that values are least stable, then value stability increases all the way during young adulthood and peaks at about 30 years old. After that, values remain rather stable but the level of stability decrease a little bit in adulthood. The pattern of status is different from the other three types, with adolescent time most stable, then bounces up and down during college years and adulthood.

When values were not divided into four categories but considered as an overall index for each study, the rank-order stability results are shown in Table2. From the results we found that the population estimates for value stability are rather high, range from .53 to .84, with the average .68, meaning that value are reasonably stable from age 13-50, with college years most unstable, and reaches the peak right after college years, and decrease a little bit at middle adulthood.

For different type of values, population estimates of overall rank-order stability with all age groups combined is shown in Table3, from which we discovered that extrinsic ($\rho=.69$) seems to be the most stable, with social ($\rho=.65$) and intrinsic ($\rho=.61$) follows, and status is less stable ($\rho=.46$) compared to the other three values, but still remains a significant level of stability across the life span.

To compare the stability and change of values with those of personality traits and vocational interests, we retrieved information from previous meta-analysis and displayed the comparison in Table4. Compare the changing patterns of values, personality traits and vocational interests, we found all of them showed a progressive increase with age. Value reaches the peak first, right after college years. Vocational interests follows, reaches the peak at the period of 25-29.9 years old, personality traits still bounces up and down even after values and interests are already stable, and does not reach the highest point until after 50. In terms of the magnitude of stability, value is similar to vocational interest, and both are more stable than personality.

Mean-Level Change

Population estimates for meta-analysis of mean-level change are shown in Table 5, Table 6 and Table 7. According to the results, we found that generally speaking, values are rather stable ($d= -.01$) across the life span, which is consistent with results from rank-order stability. However, when different categories of values are taken into consideration, mean-level change analysis gives some more information beyond that from rank-order stability analysis. Although results from rank-order stability demonstrated that four types of values are all significantly stable across each age category, mean-level change reveals

that there is significant shift of values for the whole population across almost all age periods (besides college years). That is to say, during college years, individuals change their relative standings within the rank order of the population most while the population as a whole doesn't change much. These results lend further support for the difference between rank-order stability and mean-level change, that each could individually contribute to the understanding of continuity and change from different aspects.

For different types of values, combined results show that intrinsic and social values are involved in greatest changes (intrinsic $d=.10^*$, social, $d=-.11^*$) for different directions across the life span, while extrinsic and status values are relative stable. Specifically, for intrinsic values, college years are the time when values change most. Besides intrinsic values, all other three types of value showed the highest mean-level change during 22-24.9 years old, when people just finished their college and begin to establish their careers and families. Trajectories of value change for each value dimension could be seen from cumulative d graph in Figure 1. From the figure, we notice that the changing pattern of all values are almost the same, first increase and peaks at college years, then reaches the lowest level right after college, and then increase gradually as people ages. Another interesting point is that, before 25 years old, intrinsic values are considered as most important among the four, but after 25 years old when people begin to gain more work experience and take more social roles, the importance of extrinsic values increases significantly so that they are viewed as important as intrinsic values since then.

Moderators of Rank-Order and Mean-Level Change

We investigated two moderators of both rank-order stability and mean-level change in values: cohort and time interval. In order to control for the effect of age, we also included age in the model. Since there were not enough studies to calculate male and female separately, we did not consider gender effect in the current study.

The moderating effect of time interval between two assessments was significant for three out of the four value categories (except status values) when rank-order stability was considered. It indicated that longer longitudinal studies reported lower rank-order stability, which was reasonable and consistent with previous findings (Roberts & DelVecchio, 2000, Low et al., 2005). However, when mean-level change was taken into consideration, time only had a negative relationship with mean-level change in social values, which means that longer interval was associated with larger decrease in social values.

There were almost no moderating effect of cohorts on stability and change of values, except that rank-order stability of status values was negatively correlated with cohorts, which means that status values were less stable for younger cohorts than for old ones. The absence of cohort effect may due to the overlap between cohort and age. Since age may account for part of the variability in cohort when both were entered together, the effect of cohort could disappear. This argument was further supported when age were removed from the moderating analysis, that cohort had significant effects in most of the value categories. Results for moderator tastings could be found in Table 8.

CHAPTER 4

DISCUSSION

Consistent with our hypothesis, we found that while values are rather stable when indexed by rank-order stability, they do change when viewed from the mean-level analysis. The findings of the rank-order stability support the idea that values are rather stable individual differences (Rokeach, 1973; Mortimer & Lorence, 1979; Lindsay & Knox, 1984), and this level of stability is higher as individual ages and reaches the peak during the latter part of emerging adulthood (22-25 years old). When using personality and interests as benchmark, the present results indicate that values possess a level of continuity similar to those of vocational interests (Low et al., 2005) and are more stable than personality traits (Roberts & DeVecchio, 2000).

Although values evidenced small changes in rank-order stability, which means that individuals generally maintenance their positions within a group across the life time, the results of mean-level change showed that the levels of importance attached to different values undergo fairly dramatic increase or decrease at different age periods. A clear pattern of normative change from early adolescence to the end of middle adulthood has been found, with the greatest change found during middle- through late-adolescence into young adulthood, which is consistent with mean-level change of vocational interests (Low, 2009). The above results suggest that there might be some key time period that changes take place. In Arnett's (2000) terminology, this key period might be the late teens and early twenties (18-25 years old) that he labeled as emerging adulthood. It is the time periods when individuals leave the dependency of adolescence but have not yet

enter the enduring responsibilities of adulthood that their view of the world and themselves are still open to change. Emerging Adulthood is characterized by exploration of possible life directions and frequent change as various possibilities in love, work, and worldviews are explored (Erikson, 1968; Arnett, 1998). Individuals try on different roles before they finally achieve maturity and determine their self-identity that corresponding to their values toward life and work.

The present pattern of inconsistency between rank-order stability and mean-level change is especially noteworthy for the second half of emerging adulthood (22-25 years old), when people attain the highest rank-order stability as well as largest mean-level decrease. Preferences for different values remain the same, but the absolute magnitude individuals assign to these values has declined. Compared to the first part of emerging adulthood (18-22 years old), when the main tasks for most individuals are to receive higher education or professional trainings, the relative magnitude of all values right after that period (22-25 years old) have diminished significantly. This could be viewed from the maturity of self-concepts. This time may be a transition that most people take from a student to a full-time employment, individuals may adjust their aspirations from ideal to more realistic and compromise after experiences that have allow them to learn more about their preferences (Arnett, 2000). Gribbons and Lohnes (1965) have demonstrated that as people age, there is a noticeable trend of movement from “idealism” to “realism”. Although Gribbons and Lohnes (1965) proposed the shift to realism for adolescents’ values from the eighth grade to twelfth grade, this pattern could be generalized to the whole emerging adulthood, as noted by Arnett (2000). Adolescents tend to hold high occupational aspirations and attach a great deal of importance to many values during their

educational process, which exceeds what can be offered in the labor market (Johnson, 2002; Marini, Fan, Finley, & Beutel, 1996). Eventually, individuals are more selective about their values after they leave school, and value some rewards less highly. Therefore, both occupational aspirations and work values become more realistic over time (Johnson, 2002; Johnson 2005), as indicated by the present results showing a decline of values in general.

As individuals leave emerging adulthood and step into young adulthood (after 25 years old), all values begin to increase again. The increase in the importance of values could be explained from the perspective of theory of work adjustment (Dawis & Lofquist, 1984) and the attraction-selection-attrition model (Schneider, 1987). The extent that work values change is a function of work conditions that people select, and are selected in, that are consistent with their values (Judge & Bretz, 1992; Mortimer & Lorence, 1979). Similarly, according to the person-environment fit models (Edwards, Caplan, & Harrison, 1998; Kristof-Brown, Zimmerman, & Johnson, 2005), fit perceptions could be achieved by either adapting oneself to be in line with their environmental counterparts, or changing the environment to match personal attributes. As Levinson et al. (1978) and Super (1984) noted, people who are in the early stage of their careers (i.e., new hires) are still in the process of developing their self-identity by choosing and identifying their capabilities, interests and values. Entry into the workforce is a period of adjustment that compromise between pre-owned occupational identities and the realities of the job market and its internal rules is undergoing (Jokisaari & Nurmi, 2005). With many required or obligatory roles but without the mastery of their environments during the latter age periods (Lachman & Weaver, 1998), young adults are more focused on adapting to the

idiosyncrasies of their workplaces (e.g., dealing with the boss and coworkers) than on pursuing increased fit between their interests and their environments. Hence, less experienced individuals would be more malleable in terms of their goals and values to adapt their environment. Eventually, people within a particular environment become more homogeneous, either by changing their own values, or by changing their environment. The lack of diversity in the environment hinders change and reciprocally reinforces an individual's existing values. Researchers have shown that more tenured individuals become less open to new experiences and less oriented to change as they age (Jones & Meredith, 1996; Kanfer & Ackerman, 2004; Warr, Miles, & Platts, 2001), thereafter, leading to an increase in the importance of their existing values.

Caspi and colleagues (2005) have argued that trait development is not a continuity-versus-change proposition, but that continuity and change coexist. The current findings that decrease and increase in value mean-levels without a concomitant change in stability lends further support to separate mean-level change from rank-order stability and demonstrated that each approach individually contributes to our understanding of the phenomena from different perspectives.

The trajectory of each value across different age periods provided more detailed information on stability and change. Extrinsic values are shown to be the most stable, when viewed from both the rank-order stability and mean-level change results. Intrinsic and social values are similar in terms of their stability level, but they follow different directions: people tend to become more focused on intrinsic values and less on social values as they aged. For intrinsic values, the results are reasonable and consistent with previous findings that values move toward intrinsic over time (Post-Kammer, 1987;

Sheldon and Kasser, 2001; Sheldon, Arndt, & Houser-Marko, 2003; Sheldon, 2005). A decrease in social values is probably due to how we define this category. Since we include dimensions such as contribution to the society, universalism into the category of social values, people generally become less involved in these activities as they age, therefore social values are viewed less important gradually.

Specific results for different age periods indicate that, intrinsic values increase most significantly during college years while extrinsic values go the opposite way, possibly accounted by the distinctive nature of post high-school training and education. During ages 18-22, people leave the constrained circle of family and high school, pursue novel experiences and begin exploration for their own sake. In addition, environments such as college and professional trainings also elicits, reinforces and maintains internal interests, such as learning and creativity, ability utilization, and autonomy. The “interest and satisfaction” value has been shown to be among the most important values during college time (Gribbons & Lohnes, 1965, 1968; Thompson, 1966; Wagman, 1968; Kapes & Lotowycz, 1972). Not until people take on a career and establish a family, they usually do not recognize the importance of salary and occupational safety. It is shown that family roles such as marriage and parenthood are related to greater emphasis on extrinsic rewards, such as pay, benefits, and job stability, and away from intrinsic rewards, such as having interesting, and challenging work tasks (Gorman, 2000; Loscocco, 1989; Loscocco & Kalleberg, 1988).

Despite of the amount of information provided by the current study, there do exist several limitations that deserve notice. First, the number of studies is rather limited; especially, for the dimension of status. The actual number of studies that assessed

stability and change of values is large, but a great proportion of those studies are cross-sectional. Even within the longitudinal datasets, many studies did not report sufficient information for us to complete the coding. In that case, the implications of the current results are tentative till more researches are conducted.

Another limitation is that heterogeneity still exists after values have been divided into several categories and moderators have been examined. We were not able to code several variables that are related to individual differences in their development of what is more important and what is less. Among these moderators, socio-economic status has been proved to exert an influence. For example, Johnson (2002) and Lindsay & Knox (1984) showed that young people from higher socio-economic backgrounds tend to attach greater importance to intrinsic values rather than those from disadvantaged backgrounds. Thompson (1966) also showed that the importance students placed upon leadership in the occupation was related to the socio-economic level of the student's family, as indicated by the father's occupation. Specifically, student whose father possesses a high-prestige vocations tend to place more importance being a leader in a work setting. Another important factor is their educational backgrounds. Kapes and Strickler (1975) view changes in values during high school as a results of different educational treatment, specifically, high school curriculum. Students' different motives for entering each curriculum, as well as the apparent differences in each curriculum, combined together, are responsible for different value outcomes. In addition, those who pursue higher level of education come to value having challenging work with more autonomy more than their less educated peers, who value having stable and secure work lives (Johnson & Elder, 2002). It should be noted that the population stability and normative change patterns

demonstrated in the current study does not necessarily fit for each individual, therefore, multilevel analysis of the explanatory variables that account for individual differences in their development trajectories require further investigation.

Practically, the current study has some implications for career counseling practice. Given the impact that values have on academic and occupational choice and adjustment, job satisfaction and commitment, as well as general well being, the significant mean-level changes of values across the life span provide more information for better understanding of how educational and occupational decision making and career development process influence adolescents and young adults. For example, career counselors need to take into considerations the importance of values and value congruence when giving suggestions about choosing an occupation or organization to college students. In addition, advices should be formed not only based on the current values, but also on prospect value changes due to changes of social roles associated with employment, marriage or parenthood. By preparing college students for potential value changes, counselors may help them reduce the stress level when they actually face those changes.

To conclude, the present study provided evidence for the rank-order stability as well as mean-level change of values across life spans, and showed that emerging adulthood is an essential developmental period that dramatic normative changes have taken place.

TABLES

Table 1. Population estimates of rank-order stability within each value type across age categories.

Value	Age(years)	<i>K</i>	<i>N</i>	ρ	CI(ρ)	<i>Q</i>
Intrinsic	13-17.9	4	2646	.62*	.60,.64	65.81*
	18-21.9	9	7849	.55*	.53,.56	157.44*
	22-24.9	6	4048	.66*	.64,.68	45.65*
	25-29.9	4	3583	.70*	.69,.72	65.04*
	30-52	3	2193	.65*	.63,.68	190.47*
Extrinsic	13-17.9	4	2646	.65*	.63,.67	138.66*
	18-21.9	9	9692	.58*	.57,.60	492.27*
	22-24.9	6	4048	.77*	.76,.78	242.09*
	25-29.9	4	3584	.79*	.77,.80	93.02*
	30-52	3	2193	.75*	.73,.77	305.32*
Social	13-17.9	4	2646	.62*	.60,.65	83.50*
	18-21.9	7	7865	.53*	.51,.54	496.24*
	22-24.9	4	3961	.73*	.72,.75	158.09*
	25-29.9	5	3680	.76*	.75,.77	91.73*
	30-52	3	1796	.70*	.68,.72	349.51*
Status	13-17.9	3	1636	.71*	.69,.73	42.50*
	18-21.9	4	3859	.36*	.34,.39	23.84*
	22-24.9	3	290	.39*	.29,.49	4.28
	25-29.9	2	196	.35*	.22,.47	0.92
	30-52	2	667	.24*	.17,.31	2.78

Note. ρ =estimated population correlation; *K*=number of samples; *N*=number of participants aggregated for each category; CI=95% confidence interval for estimated population correlation; *Q*=heterogeneity statistic. * $p < .05$.

Table 2. Population estimates of overall rank-order stability across age categories.

Age(years)	<i>K</i>	<i>N</i>	<i>P</i>	CI(ρ)	<i>Q</i>
Overall	29	25592	.68*	.67,.68	3840.95*
13-17.9	6	4666	.60*	.58,.61	199.26*
18-21.9	9	9692	.53*	.52,.55	367.94*
22-24.9	7	5457	.84*	.83,.85	1406.25*
25-29.9	4	3584	.76*	.74,.77	77.41*
30-52	3	2193	.71*	.68,.73	274.26*

Note. * $p < .05$.

Table 3. Population estimates of rank-order stability for four values.

Value	<i>K</i>	<i>N</i>	<i>P</i>	CI(ρ)	<i>Q</i>
Intrinsic	25	22162	.61*	.61,.62	744.23*
Extrinsic	26	22163	.69*	.68,.69	1931.58*
Social	23	19948	.65*	.64,.66	1755.47*
Status	14	6648	.46*	.44,.48	424.24*

Note. * $p < .05$.

Table 4. Comparison of rank-order stability for value, personality and interest.

Age(years)	Value	Personality	Interest
12-17.9	.60*	.47	.57
18-21.9	.53*	.51	.67
22-24.9	.84*	.57	.70
25-29.9	.76*		.83
30-39		.62	.69
40-49	.71*	.59	
50-59		.75	

Note. * $p < .05$.

Table 5. Population estimates of mean-level change within each value type across age categories.

Value	Age(years)	<i>K</i>	<i>N</i>	<i>D</i>	CI(<i>d</i>)	<i>Q</i>
Intrinsic	13-17.9	3	2189	.04	-.10, .18	.29
	18-21.9	8	6180	.18*	.08, .28	19.77*
	22-24.9	5	1148	-.04	-.17, .09	17.61*
	25-29.9	6	1116	.07	-.05, .19	14.15*
	30-52	5	709	.18*	.04, .31	4.95
Extrinsic	13-17.9	4	2685	-.04	-.10, .01	13.22*
	18-21.9	8	6180	-.08*	-.11, -.05	33.26*
	22-24.9	5	1148	-.18*	-.25, -.12	187.88*
	25-29.9	6	1117	.10*	.04, .16	40.63*
	30-52	7	979	.16*	.08, .23	15.58*
Social	13-17.9	3	2026	-.15*	-.29, -.01	1.10
	18-21.9	5	1063	-.00	-.13, .13	17.23*
	22-24.9	3	1061	-.26*	-.40, -.11	9.31*
	25-29.9	7	1213	-.14*	-.25, -.03	5.35
	30-52	5	709	.02	-.16, .12	8.70
Status	13-17.9	4	2685	-.05	-.17, .07	9.75*
	18-21.9	5	768	-.04	-.17, .08	4.29
	22-24.9	4	886	-.39*	-.54, -.23	7.66
	25-29.9	6	965	.25*	.13, .38	6.49
	30-52	5	709	-.03	-.17, .11	5.49

Note. *d*=estimated population mean difference; *K*=number of samples; *N*=number of participants aggregated for each category; CI=95% confidence interval for estimated population correlation; *Q*=heterogeneity statistic. **p* < .05.

Table 6. Population estimates of overall mean-level change across age categories.

Age(years)	<i>K</i>	<i>N</i>	<i>D</i>	<i>CI(d)</i>	<i>Q</i>
Overall	29	15168	-.01	-.03, .00	207.20*
13-17.9	4	2685	-.04*	-.08, .00	16.81*
18-21.9	9	9509	-.01	-.03, .01	89.25*
22-24.9	5	1148	-.17*	-.24, -.11	26.62*
25-29.9	6	1117	.12*	.06, .19	22.54*
30-52	5	709	.08*	.00, .16	2.59

Note. * $p < .05$.

Table 7. Population estimates of mean-level change for four values.

Value	<i>K</i>	<i>N</i>	<i>D</i>	<i>CI(d)</i>	<i>Q</i>
Intrinsic	27	11342	.10*	.04, .15	65.90*
Extrinsic	30	12109	.03	-.02, .08	92.68*
Social	23	6072	-.11*	-.17, -.05	50.05*
Status	23	6013	-.02	-.08, .04	74.36*

Note. * $p < .05$.

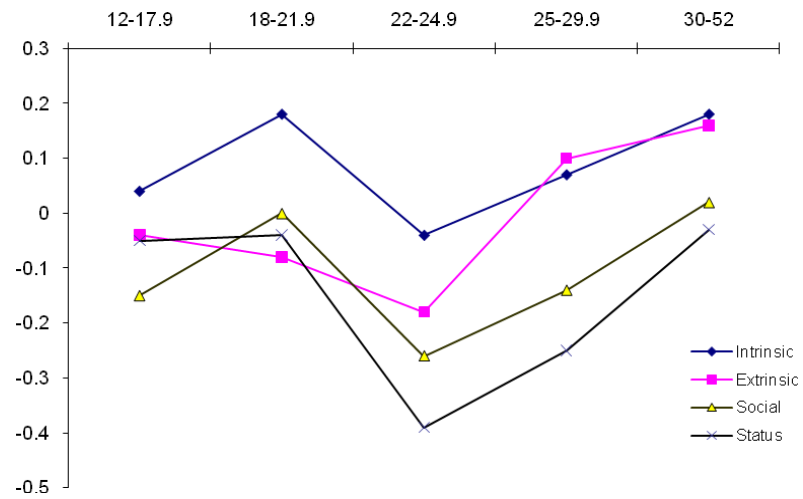
Table 8. Moderators of values stability and change across the life course.

Values	K	Age	Cohort	Time	Q _E
<i>Rank-Order</i>					
Intrinsic	26	.0228	-.0022	-.0223**	401.22**
Extrinsic	26	.0428	-.0076	-.0349**	1137.84**
Social	23	.0500	-.0032	-.0484*	837.68**
Status	14	-.1180**	-.0054*	.0022	96.38**
<i>Mean-Level</i>					
Intrinsic	27	-.0177	-.0030	.0018	60.21**
Extrinsic	30	.0321	.0012	-.0014	321.08**
Social	23	.0113	-.0035	-.0189*	40.67**
Status	24	.0503	.0013	-.0060	68.00**

Note. Coefficients are unstandardized beta weights in the metric of the standardized mean-level difference scores. K = number of samples; Q_E = test for residual heterogeneity after accounting the effect for moderators. * $p < .05$, ** $p < .01$.

FIGURES

Figure 1. Cumulative d chart of mean-level change for four values.



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* Indicates studies included in the meta-analysis.

AUTHOR'S BIOGRAPHY

Jing Jin graduated from Peking University in Beijing, China in 2008 with a Bachelor of Science degree in Psychology. After graduation, she came directly to Champaign, Illinois to pursue her graduate study in Industrial/Organizational Psychology. After the completion of her Master of Science degree in Industrial/Organizational Psychology in 2010, she will continue to pursue her Ph.D. degree and intend to graduate in 2013.