

The Temporal Reciprocity of Values and Beliefs: A Longitudinal Study within a Major Life
Transition

Robin Goodwin*, Brunel University

Ela Polek, University College Dublin

And

Anat Bardi, Royal Holloway University of London

* All authors contributed equally to the writing of this article.

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We are grateful to Kinga Goodwin for her help in collecting the data and in providing feedback on an earlier version of this paper. Correspondence to: Robin Goodwin, Psychology, Brunel University, Kingston Lane Uxbridge, London UB8 3PH, UK. E-mail:

robin.goodwin@brunel.ac.uk

Abstract

Values and beliefs (or social axioms) are important personality constructs, but little previous work has examined the relationship between the two, and none has examined their real-life longitudinal effects on one another. Major life transitions – such as moving to a new culture – can challenge existing values and beliefs, and therefore provide a particularly useful context for the analysis of value and belief change. The main aim of this research was to examine whether values may predict theoretically meaningful belief change and vice versa. Polish migrants participated in the study shortly after their arrival in the UK, and at two, subsequent, nine-month intervals ($N = 172$). Cross-lagged effects suggested reciprocal effects of values and beliefs, depending on the value involved. Findings are discussed in the light of current debates over personality change, as well as the broader impact of significant life transitions on personality.

Key words: values, beliefs, social axioms

Values and beliefs form important parts of personality (see, e.g., McAdams, 1995; McCrae & Costa, 1999). Some values and beliefs seem naturally related, yet they are rarely studied together, and their reciprocal effects on one another have never been studied. A major life transition, such as migration, is likely to bring changes in the personality. We propose that personal values may predict theoretically meaningful changes in personal beliefs and vice versa. Such an examination is likely to enhance integrative understanding of the personality and answer recent calls for better integration of elements of the personality (e.g., Cervone, 2005).

In an attempt to increase the understanding of personality as a broad system that extends beyond the traditional focus on personality traits, McCrae and Costa (e.g., McCrae & Costa, 1999) and McAdams (e.g., McAdams 1995), have proposed theoretical models of a system of personality. In both of these proposed systems, values and beliefs are located in the same area of personality. In the model proposed by McCrae and Costa, values and beliefs, alongside goals and attitudes, are considered as characteristic adaptations, influenced both from within the person (basic tendencies reflected in traits) and from the outside (e.g., cultural norms, life events). In McAdams's model (e.g., 1995), values and beliefs, alongside other motivational variables and strategic constructs, are considered as mid-level personality variables, being more contextualized than broad personality traits, and less contextualized than life stories. As values and beliefs are at the same mid-level of personality, and as they are both characteristic adaptations, implying that they are expected to change as part of adapting to new life circumstances, it is important to study how they might affect one another in the process of adapting to a life transition.

Values (e.g., tradition, self-direction) convey what is important to people in their lives. They can be seen as broad life goals that act as general guiding principles in people's lives (e.g., Schwartz, 1992). In doing so, they guide perception, goals, attitudes, and behavior

(reviewed in, e.g., Bardi, Calogero, & Mullen, 2008; Maio, 2010; Roccas & Sagiv, 2010). Schwartz (1992) identified ten value types, organized in a quasi-circumplex structure. This circumplex can be divided along two bipolar dimensions. One dimension contrasts valuing openness to change (self-direction, stimulation, and sometimes hedonism values) with valuing conservation (conformity, tradition and security values). The other dimension contrasts valuing self-transcendence (universalism and benevolence values) with valuing self-enhancement (power, achievement, and sometimes hedonism values). The ten values and their structure have been supported in numerous countries around the world (see Schwartz, 2005a).

Social beliefs represent broad assumptions about the world, or “social truths” (Leung et al., 2007, p. 107). A recent framework for studying social beliefs is the Social Axioms approach (e.g., Leung & Bond, 2004). Leung and Bond (2008) define social axioms as “generalized beliefs about people, social groups, social institutions, the physical environment, or the spiritual world as well as about categories of events and phenomena in the social world” (p.198). According to Leung and Zhou (2008), these beliefs are axiomatic in the sense that they are rarely questioned or elaborated upon. Instead, they serve as assumptions about how the world operates in the form of X leads to Y or X is associated with Y. These assumptions about the social world are likely to affect perception and behavior (reviewed in Leung & Zhou, 2008). Leung et al. (2002) identified five individual-level axioms – social complexity (the belief that the social world is complex: people do not always react in the same way and there are multiple solutions to any problem), fate control (a belief that events are largely predetermined by fate), social cynicism (a cynical, negative view of human nature), religiosity (a belief that religious practice, belief and institutions are beneficial), and reward for application (a belief that investment will lead to positive outcomes). These five social axioms are quite orthogonal as has been found in diverse cultural samples (Leung & Bond, 2004; see also Cheung, Leung, & Au, 2006).

As both values and social axioms affect perception and behavior, both affect the individual's functioning. However, values and beliefs also differ in subtle, but theoretically important, ways (Leung & Bond, 2004). Using the expectancy model, Leung et al., (2007) argued that values can be understood as generalized personal valences (e.g., I value broadmindedness), whereas social axioms can be seen as generalized expectancies about contingencies in the world (e.g., a change in social context can cause a person to behave differently). Hence, social axioms are less evaluative than values (Leung & Zhou, 2008; Safdar, Lewis & Daneshpour, 2006). Values are guides to goals and behavior, whereas social axioms guide the perceived effectiveness of particular activities (Leung & Zhou, 2008). Further, values are largely seen as a joint product of the individual's needs, traits and temperament on the one hand, and culture, socialization, and personal experiences on the other (e.g., McCrae & Costa, 1999). However, social axioms are believed to stem mainly from socialization and everyday social experiences (Leung & Bond, 2004; Leung & Zhou, 2008).

Although values and social axioms are theoretically distinct, it is plausible that some values and social axioms are related to one another. For example, those who value tradition are also likely to believe that religious institutions are beneficial (religiosity social axiom). Hence, it is reasonable to expect that values and social axioms will be empirically correlated. This has been examined in two previous papers. Bond, Leung, Au, Tong, and Chemonges-Nielson (2004) used Schwartz's four higher order value types; Leung et al. (2007) used the 10 values in five cultural groups. As they expected, social axioms and values had theoretically meaningful but generally weak correlations. For example, social complexity had the expected significant but weak correlations with self-direction ($r = .11$) and tradition values ($r = -.19$). We propose that these weak correlations may have stemmed from the possible status of social axioms as truisms, similar to Maio and Olson's (1998) suggestion with regard to values. Indeed, Leung and Zhou (2008) reasoned that the label 'axiom' reflects the lack of questioning of these beliefs

in normal day-to-day life. If both values and social axioms are not usually questioned, they may have developed in relative isolation from one another, resulting with weak correlations between them. This is similar to the understanding of inconsistencies between attitudes that were developed as truisms and other cognitions or behaviours (Wilson, Dunn, Kraft, & Lisle, 1989). Specifically, when parts of the self are developed as truisms, and are therefore not elaborated upon, the individual does not have the opportunity to realize that they are inconsistent with other parts of the self. However, we propose that during a life transition, people are more likely to re-assess their lives and the assumptions that guide them (see also Bardi & Goodwin, 2011). As values and social axioms may converge in their effect on the person's functioning and adjustment to a life transition, we may find that the two affect changes in one another in a theoretically meaningful way.

Value and belief change

As central aspects of the self (Brewer & Roccas, 2001; Rokeach, 1973), and as concepts that are rarely questioned (Maio & Olson, 1998), values are usually viewed as 'relatively stable' (e.g., Rokeach, 1973). Bardi and Goodwin (2011) suggested that values are stable by default. They only change under certain circumstances. They suggested that one such circumstance is a major life transition (see also Rokeach, 1973). A new life situation is likely to elicit many frustrations and unexpected outcomes to habitual behavior which may challenge the existing value system, possibly leading to its change (see more detail in Bardi & Goodwin, 2011). Indeed, meaningful value change during a life transition has been found in the past (Ferriman, Lubinski, & Benbow, 2009).

A similar process may occur for beliefs. These axioms are functional, and should also reflect the everyday reality constraints of environmental influences, as well as the feedback received during daily interactions (Leung & Bond, 2004; Leung, Ip, & Leung, 2010). As

argued above, they should be therefore proximally related to adjustment to new life transitions. Indeed, because axioms are closely connected to perceived contingencies in the social world, they are perhaps even more likely to change as a reaction to sustained environmental changes (Leung & Bond, 2004).

In this paper, we argue that the value-axiom relationship may be dynamic and reciprocal, with goal desirability (value) dependent on its' surrounding beliefs (Hui & Hui, 2009). Hence, beliefs may emerge from value-filtered experiences, but also have channeling effects on values (Leung & Bond, 2004), with the cognitions that form social axioms influencing goals (Leung et al., 2007). Observing one's outcomes may lead to evaluating the effectiveness of different strategies in an environment, and potential modification of these that reflect shifts in social beliefs (Leung & Bond, 2004). Recently, Leung and Zhou (2008) suggested that values and beliefs should be related to one another because motivations (values) and cognitions (beliefs) are often related. They outlined three directions of influence that could lead to links between values and beliefs: From beliefs to values, from values to beliefs, and a third variable influencing both values and beliefs. First, they consider the possibility that axioms influence values. This is motivated by the desire for cognitive consistency. Specifically, a belief may be associated with a desirable outcome, which may lead to the stressing of particular values. For example, a belief that the less powerful are easily exploited may contribute to a greater valuation of power. If a person believes that those who have less power will be exploited then it is more adaptive to have power (Leung & Zhou, 2008). This should therefore lead to striving for power, partly by holding power values as important.

The second route to connecting values that Leung and Zhou (2008) suggested is that values can direct axioms through experiences, such that individuals with particular values are encouraged to take part in activities that encourage certain beliefs. For example, tradition

values may encourage activities that represent the world as unambiguous (low on social complexity), thereby leading to little belief in social complexity.

The final route that Leung and Zhou (2008) suggested to connect values and beliefs is that a third variable may affect both of them, with particular ecological aspects of an environment encouraging the endorsement of both a belief and value. For example, living under communist regimes may have encouraged both social cynicism and power values (see Schwartz & Bardi, 1997). To the best of our knowledge, ours is the first study of the longitudinal relationship between values and social axioms.

Migration and Value and Belief Change

Moving to a new society is widely viewed as a process that leads to change (see Berry, 1992). Migration is likely to challenge existing world-views of the person including values and beliefs. Initial beliefs and values can inform appraisals and acculturation strategies used in the new culture (Berry, 1994). Values and beliefs may be activated by new circumstances, or challenged by a new environment (Bardi & Goodwin, 2011; Seligman & Katz, 1996). Daily social interactions may lead to changes in the value system as interaction can lead to new values and aspirations (Feather, 1979) partly through providing reinforcement contingencies (Bardi & Goodwin, 2011; Bond, 2005) that then strengthen values or beliefs. New situations may encourage the uptake of new values (for instance, where job experiences require more self-directed work; Kohn & Schooler, 1983), as well as provide new cultural primes (such as when individuals are exposed to a new value schema or language in a new setting (Bardi & Goodwin, 2011; Hong, Morris, Chiu, & Benet-Martínez, 2000).

In this paper we focus on one social belief which is particularly relevant to migrants: social complexity. This belief concerns the recognition that there are numerous ways to achieve outcomes, and that others' behavior is often unpredictable. Social complexity suggests that

“there are no rigid rules but rather multiple ways of achieving a given outcome, and that apparent inconsistency in human behavior is common” (Leung et al., 2002, p. 292), and reflects a “complex theory of social causation” (Leung & Bond, 2004, p. 119). In a new cultural setting, behaviours of others are not necessarily predictable, and interactions are often novel, unstructured, and uncertain (Kosic, Kruglanski, Pierro, & Mannetti, 2004). Hence, beliefs in the variability of people’s responses have the potential to change in this context. Social complexity has been found to be associated with cognitive complexity (Singelis, Hubbard, Her, & An, 2003). A belief in cognitive complexity can be seen as an antithesis to a ‘need for closure’ (Golec de Zavala & Van Bergh, 2007; Jost, Kruglanski, Glaser & Sulloway, 2003; see also Leung & Bond, 2004): the need to hold a firm belief about a topic, and for predictability (Kossowska & Van Hiel, 2003). Work on need for cognitive closure suggests that those high in complexity will find it easier to adjust to the often unsettling and complex life of a migrant (Kosic et al., 2004). Social complexity is also positively related to problem-solving coping (Bond, Leung, Au, Tong, Carrasquel, et al., 2004) often needed in adjusting to a new country, and may be particularly valuable when the individual faces challenges which require constructive actions (Safdar, Lewis, Greenglass & Daneshpour, 2009). To the extent that social complexity encourages out-group engagement such a belief is also likely to be functional, allowing for greater understanding and identification with the new cultural group (Ward, Berno & Main, 2002). Hence, social complexity functions as a cognitive resource (Bond, Leung, Au, Tong, & Chemonges-Nielson, 2004) particularly when trying to adjust to life in a new country.

While we expect that values will predict changes in social complexity when one enters a new life situation, we also recognize that a belief in social complexity can lead to changes in certain values. Therefore, we followed migrants to the UK from up to 3 months after entering the UK (T1) through 9-12 months after entering (T2), until 18-21 months after entering (T3).

We measured their values and social axioms in each of the three times of assessment. Below we explicate the possible dynamic relations between *social complexity* and three values that are the most relevant to social complexity in the context of migration – *self-direction*, *universalism*, and *tradition*. These values are the most relevant to social complexity because they all tap into openness in thought, also seen as characterizing social complexity.

Specifically, *self-direction* expresses valuing openness to new ideas (particularly in its curiosity aspect); *universalism* expresses openness to other people's ways of life (particularly its tolerance and broadmindedness aspect); and *tradition* expresses valuing traditional ways of life (e.g., in its aspect of respect for tradition). These values are also at least moderately correlated with value-expressive behaviours (see Bardi & Schwartz, 2003). We outline our hypotheses for the relationship between values and social complexity below.

1. Tradition

A): *From values to beliefs*

People who value tradition highly are likely to be threatened by seeing that others do not behave according to traditional ways. Migrants who value tradition are likely to engage most readily within their migrant community, both at home and in their new culture. To protect their traditional world-view they are likely to respond to seeing that people behave in unpredictable ways by justifying the importance of behaving in the one prescribed way that religion dictates (see also Leung & Zhou, 2008) and reject a belief that there is more than one acceptable way of responding to situations, i.e., a belief in social complexity.

B): *From beliefs to values*

People who enter a new country with a strong belief that the behaviour of others is predictable are likely to feel a threat to their world-views when they witness that others behave in unpredictable ways. This may lead them to seek comfort in well-known cultural symbols and practices, and therefore they may increase their endorsement of traditional values in their new

environment. In contrast, those with stronger social complexity beliefs may come to challenge their traditional values, so that over time, social complexity will lead to a reduction in the importance of tradition values.

2. Self-Direction

A): *From values to beliefs*

People who value self-direction value openness to new ideas. As part of living in a new country they realize that others respond to them in ways that they cannot predict. Because they value openness to new ideas, they are not likely to find such a revelation threatening and come to realize even more than before that different people behave in different ways, thereby increasing their beliefs in social complexity.

B): *From beliefs to values*

Individuals who enter a new country believing that people differ in the way that they respond to situations are not likely to be threatened by witnessing that they cannot always predict others' behaviour. Rather, this is likely to increase their curiosity, leading to an increase in self-direction.

3. Universalism

A): *From values to beliefs*

Tolerance is part of universalism values. Individuals entering a new country, who value tolerance towards ideas and beliefs that are different to their own, are not likely to be threatened by seeing that people behave in a way that they do not expect or understand. Indeed, seeing this phenomenon is likely to strengthen their belief that people differ in their responses to situations and thereby to increase their beliefs in social complexity.

B): *From beliefs to values*

Individuals who enter a new country believing that people differ in their responses to situations and that others' responses are not always predictable are likely to respond to witnessing that

this is the case by being more convinced that tolerance is important and, in general, that universalism values of respect to all human beings are more important than they initially thought. The importance of universalism values may increase for such individuals.

While some psychological outcomes may be evident early in this life transition, others may occur later (see evidence and review in Bardi & Ryff, 2007). However, we have no particular reason to specify which longitudinal effects should occur early in the transition and which ones should occur later on; hence we make no specific temporal predictions.

Method

Participants

Data for this study were from the Longitudinal Study of Polish Migrants (LSPM). Participants in the LSPM were Polish immigrants in the UK who have been living in Britain for no longer than three months and who expressed willingness to stay in Britain for a minimum of two years. Data for this study were collected in 3 waves (Time1: up to three months after migration; Time2: 9-12 months after migration; Time3: 18-21 months after migration). Four hundred eighteen respondents participated in this study in T1 (51% female), 228 in T2 (53% female), and 214 at T3 (retention rate from T1 = 51%). Of our T3 respondents, 40 respondents had returned to Poland. We analysed the data from 172 respondents (55% women) who participated in all three waves and were still in the UK at T3. At T1, the mean age of respondents in this sample was 26.93 years ($SD=6.99$, ranging from 18 to 59 years). Forty-five percent of respondents had a university degree.

To check for selectivity in sample wave dropout, we compared the remaining respondents to those who dropped out in consecutive waves on age, sex, marital status, educational level and on variables of focus in this study: self-direction, universalism, tradition and social complexity. No significant differences were found between the remaining

participants and those who dropped out, either at T2 or at T3 on demographic variables, suggesting that demographic variables were unrelated to sample attrition. However, participants of all three data waves, who constituted the final sample in this study, had a higher score (4.11) on social complexity T3 ($p < .04$) than sample dropouts (3.94) and higher scores on universalism T2 (0.42) compared to sample dropouts (0.19) ($p < .05$).

Procedure

Participants were recruited through a wide variety of methods, and were paid the equivalent of U\$9 for completing T1, rising to U\$12 (T2) and U\$15 (T3). To recruit participants, we placed a banner advertisement on the major internet portal for Polish people in Britain, as well as other regional websites for Polish migrants across Britain, with links to the project website. Leaflets with the project details were also distributed in Polish shops and newsagents, internet cafes in Polish neighborhoods, Polish churches, airports, coach stations, employment agencies and Polish community groups. In addition, articles advertising the project were published in the Polish language journals in the UK. As a result, our sample was from a wide diversity of locations across Britain, with respondents from all the major cities in England, Scotland, Wales and Northern Island as well as small, more isolated villages and Scottish islands. As such, they represent the unusually widespread nature of the recent Polish migration to Britain (Burrell, 2009).

The survey was written in Polish. All scales were back translated by English-Polish speakers, and piloted on ten new Polish migrants to the UK, chosen to represent a range of social classes of migrants in the UK. Participants then completed the questionnaire on-line. The survey program used did not allow for incomplete responses: there was therefore no missing data.

Measures

The Schwartz value theory has been successfully used in the analysis of migration (e.g., Kurman & Ronen-Eilon, 2004) and value change (e.g., Bardi, Lee, Towfigh, & Soutar, 2009), and forms the basis for our exploration of value change following movement to a new culture. Values were measured using the Portraits Value Questionnaire (Schwartz et al., 2001). It assesses the endorsement of the ten values listed above, by describing people in terms of values and asking respondents ‘how much is this person like you’ on a six-point scale (from (1) *not at all like me* to (6) *very much like me*). A typical item read “(the person) wants everyone to be treated justly, even people he or she doesn’t know. It is important to (this person) to protect the weak in society” (measuring universalism). Following Schwartz’s (1992) guidelines about controlling scale bias we centered item ratings around the personal mean of value ratings (see Bardi & Schwartz, 2003 for details). To assess *social axioms* we used the two high-loading items from scale *Social Complexity* in the Leung’s Social Axioms Survey (SAS) (Leung et al., 2002): “People may have opposite behaviors on different occasions” and “Human behavior changes with the social context”. Participants responded on a 5-point scale from (1) *strongly disagree* to (5) *strongly agree*. The internal consistency (Cronbach’s Alpha) of the 6-item universalism scale was .79 (T1), .82 (T2), and .84 (T3); for the 4-item scale measuring tradition this was .65 (T1), .60 (T2) and .63 (T3) and for the 4-item scale measuring self-direction this was .64 (T1), .68 (T2), and .74 (T3). Internal consistency for the 2-item social complexity scale was .68 (T1), .76 (T2), and .85 (T3).

Demographic variables such as age and education level are likely to lead to systematic differences in life events that might affect value and belief change. Therefore, the following socio-demographic factors were controlled for in the analyses: age, education, sex, marital status, and having children.

Results

In order to test our hypotheses we used cross-lagged panel design, which allows comparison of the effects of variables on each other in opposite directions over time (Lazarsfeld, 1940). Such a method enables testing cross-lagged effects (see Figure 1 – pathways B) from value at T1 to axiom T2, from axiom T1 to value T2; from value T2 to axiom T3 and from axiom T2 to value T3. In general, it is advised that structural equation models (including cross-lagged models) are theory-driven and variables included in a model (selected based on theoretical expectations) are related with each other. Following this, we computed three cross-lagged models testing relations proposed by our hypotheses. Testing three cross-lagged models separately for each value stemmed from theoretical grounds: the three values in focus tap on different motivational aspects, and are not usually combined together, so there are no theoretical grounds to combine them in one index or include them in one cross-lagged model. Analysing these values separately enables better understanding of the suggested processes and is more informative because their results differed meaningfully (particularly the difference between universalism and the other two values).

The cross-lagged panel data formed from values and axioms in T1, T2, and T3 were analysed using structural equation modelling (SEM) performed with Mplus 5 (Muthén & Muthén, 2007). Three subsequent SEM models were analysed containing eleven observed variables: values at T1, T2, T3, axiom at T1, T2, T3 and the controlled variables – age, education, sex, marital status, and having children, used in the model as predictors of values at T1. The four controlled variables were ordered categorical: education, sex, marital status and having children. We used probit regressions based on robust weighted least squares estimation. Categorical variables functioned as independent (exogenous) variables in all three models, and theta parameterization was used. In line with current practice, several criteria were used to assess the fit of the data to the model – χ^2 , p , CFI, RMSA. Browne and Cudeck (1993) suggested that the root mean square error of approximation (RMSEA) values larger than 0.1

are indicative of poor-fitting models, values in the range of 0.05 to 0.08 are indicative of fair fit, and values less than 0.05 are indicative of close fit. However, for models with categorical variables, such as tested in the present study, a cut-off value of RMSEA close to 0.08 is recommended (Hu & Bentler, 1999). The final index of choice is the comparative fit index (CFI), indicating whether the model provides significantly better explanation of the relations between variables than the null hypothesis-model with no relations between variables. Values above .95 indicate an acceptable fit (Bentler, 1990). Following the general recommendations (Boomsma, 2000), in a first step, Pearson's correlations between continuous variables were calculated. Table 1 presents means, standard deviations and correlations between values – tradition, self-direction, universalism and the social axiom – social complexity – in the three waves of data collection.

We investigated three separate SEM models as specified in Figure 2. Some of the predicted paths were non-significant, yet we retained them in the model, as the full model is more informative for the purposes of this paper. Goodness of fit indexes are reported in Figure 2. The models showed that social complexity at T1 predicted a reduction in the importance of tradition values at T2. In turn, tradition values at T2 predicted a reduction in social complexity belief at T3. Self-direction values predicted an increase in social complexity belief in both time lags. Interestingly, the effect of self-direction on social complexity became stronger over time. Social complexity belief predicted an increase in the importance of self-direction values in both time lags, but the effect of social complexity on self-direction weakened over time. Remarkably, we did not observe correlations between self-direction and social complexity measured at the same time, which suggests that the cross-lagged coefficients between self-direction and social complexity stemmed from longitudinal effects. Universalism predicted an increase in social complexity in both time lags. A reciprocal relation of social complexity on universalism was not found.

Discussion

Over the last three decades, there has been a considerable resurgence in the study of values and beliefs. However, as yet there has been no research on the longitudinal reciprocity between these important aspects of personality. In this study of a large migrant community in the UK, we examined the reciprocal relationships between three values – tradition, self-direction, and universalism – and the social axiom of social complexity. Initial (T1) social complexity beliefs predicted a reduction in tradition and an increase in self-direction values nine months later (T2). Social complexity at T2 also predicted an increase in self-direction at T3. Both universalism and self-direction values at T1 and T2 predicted an increase in social complexity at T2 and T3, respectively, while tradition at time 2 was negatively correlated with universalism at T3. Full reciprocity was demonstrated for self-direction values, with the absence of contemporaneous correlations between values and beliefs suggesting reciprocity only in the longitudinal context.

First, let us consider the three cross-lagged models, starting with the model containing tradition and social complexity. A longitudinal effect between social complexity and tradition values found in the present study is in line with Leung et al (2007)'s research, which found a negative correlation between the two. Our findings are also consistent with cross-sectional work on need for closure, which also found a significant correlation between this concept and tradition values (Calogero, Bardi, & Sutton, 2009; Kossowska & Van Hiel, 2003) and traditional worldviews (Golec & Van Bergh, 2007). Migrants who hold strong traditional values are likely to maintain close ties with their immediate social network, often based around Church attendance (Smith & Schwartz, 1997). Such traditional networks may discourage the learning of English, a key predictor of broader network formation (Gaudet & Clément, 2008). Those with strong traditional views may thus not explore the range of social interactions that

might lead them to challenge their beliefs about life's complexities. This explanation for the effect of tradition values on social complexity beliefs may be relevant only in the long run, as it received support from T2 to T3, but not from T1 to T2. As our explanation had to do with developing social networks, we may have observed only delayed effects because social networks take about a year to develop in a new culture (see evidence, e.g., in Tartovsky, 2009). In contrast to this direction of effect, the expected effect from social complexity beliefs to tradition values was evidenced in our study only in the short run, i.e., from T1 to T2. This finding converges with Bardi et al.'s (2009) finding that the extent of major life events predicted most strongly changes in tradition values. Hence, it may be that major life events (such as migration) are quick to affect tradition values, and such value changes occur only shortly after the life transition, and perhaps then reach stability. Without further supporting data, we can only speculate at this stage. Replication of these findings in future research will prompt further questions regarding the exact timing of the relationships between social complexity and tradition, and the way in which this may reflect the developing experiences of people who have experienced a major life transition.

In contrast to highly traditional people, those who value self-direction are likely to be open to change, are less confined by traditional ways of behavior that might limit their exposure to alternative lifestyles and opportunities, and enjoy wider social networks (Güngör, 2007; Ward et al., 2002). This may introduce them to new communities and challenge existing worldviews, leading to stronger beliefs about social complexity. In turn, acknowledging the complexity of social relations in the new society may lead to an appreciation of the adaptability required in a new situation, leading individuals to increase their valuation of self-direction over time. By recognizing that behavior is less consistent, one recognizes that others cannot necessarily be relied on (Singelis et al., 2003), and this may encourage self-reliance in the new

society. Hence, social complexity beliefs may act as a driver, with the recognition of the inconsistency of the new environment encouraging self-direction over time.

With regard to universalism values, we found cross-lagged effects only in one direction: from values to beliefs. This suggests that holding universalism values such as tolerance to different beliefs when entering a new country facilitates an increase in the belief that the social world is complex and that people do not always behave in the way that one would expect. However, entering a new country with the belief that the social world is complex does not lead to a change in universalism values, such as tolerance. For some migrants realization that there are different ways of behaving in the new country may lead to greater importance of acceptance of alternative ways (greater universalism values). Yet, other migrants may realize that people in the new country behave in a different way to their original country but at the same time reject this alien way of behavior as unacceptable, and increase their endorsement of traditional values instead. Hence, on balance, we do not observe a directional change in universalism as a function of social complexity beliefs.

Our data showed notable consistency in values across the three waves. This is perhaps unsurprising, given that values are generally seen as representing central schemas largely resistant to change (Bardi & Goodwin, 2011). Our value consistency scores were similar to Schwartz's (2005b), who reported test-retest consistencies of between .58 and .66 over 2 years. In the migration context, values influence where people migrate to, as well as why they migrate (Tartakovsky & Schwartz, 2001). Previous work suggests that voluntary migrants are less traditional and collectivistic in orientation than comparable others who remain at home (Feldman, Mont-Reynaud, & Rosenthal, 1992), and this may be well reinforced in their new life style. This value proximity may be particularly likely in countries where there is relatively small cultural distance (Safdar, Dupuis, Lewis, El-Geledi, & Bourhis, 2008), and where migrants see themselves as temporary, sojourner-like visitors, with little motivation for

fundamental value change (Berry & Sam, 1997). Indeed, Polish migrants in the UK see themselves mainly as temporary migrants (Equality and Human Rights Commission, 2010). In contrast, social complexity scores were less stable in our sample, and may more directly reflect the wide daily range of experiences of our migrants – and the new cultural learning that can occur following major life changes (Lazarus, 1993). Social axioms were also somewhat more influenced by values, rather than vice versa. Such findings, if replicated, suggest that social axioms may be less stable than values over time, or that their level of stability would depend on the potential of the social context for changing a certain belief. Such an argument is in line with the contention that social axioms, with their close relation with perceived contingencies, are more subject to change in new environments or when facing novel challenges (Leung & Bond, 2004).

Implications, Limitations, and Future Directions

What are the implications of our findings? We consider implications to understanding psychological changes in migrants; value and belief change as part of life changes; and implications for research on personality change. Our findings have implications for the social behaviour of new migrants. As argued above, social complexity may be a particularly functional belief during migration. Previous work on the behavioural and attitudinal correlates of social complexity suggests that those who hold this belief enjoy better relations with others, including strangers (Leung et al, 2007; Singelis et al, 2003), are more tolerant of others (Safdar et al., 2008), and demonstrate less prejudice (Neto, 2006). In contributing to an increase in self-direction, and challenging traditional views, we would argue social complexity beliefs may be particularly functional during the migration process, as they encourage individuals to challenge ensconced viewpoints that may not function well in their new setting. Those that enter their new country with a belief in social complexity should therefore be ready to adapt new lifestyles

distinct from those they followed in their home countries. Similarly, migrants who value tolerance may be willing to join British community groups, and to have a partner from the host culture which may lead to greater belief in social complexity. In addition, because people who value self-direction value openness to new ideas, they may enjoy good social networks with people from the host culture, which may lead to greater belief in social complexity. Studying the reciprocal changes of values and beliefs has the highest ecological validity if it is studied within a real-life longitudinal study. However, this also means that only one context is studied at a time. Hence, future research should study other life transitions and the values and beliefs that are most relevant to them in order to provide better generality of the processes of personality change reflected in value and belief effects on one another.

Can we expect the results to replicate cross-culturally? Our hypotheses were not based on a rationale specific to moving from Poland to the UK or specific to the conditions of moving (primarily economic migration). However, what may determine replicability of the results is the extent to which a belief in social complexity and its associated values fit the host culture. We argued in the introduction that believing in social complexity is likely to aid adjusting to a new culture because the reality is that the migrant may not be able to predict locals' behaviour due to different norms operating in the two cultures. Based on our rationale and results, high initial social complexity belief is likely to increase the importance of self-direction values and decrease the importance of tradition values. As high emphasis on self-direction values and low emphasis on tradition values are typical for individualistic cultures, this likely change in values may also aid adjustment to a culture that is more individualistic than the home culture. So these processes of belief and value change are compatible with good adjustment in the move to a more individualistic culture. Our sample moved to a culture that is higher on individualism compared to our migrants' home culture (see empirical evidence in, e.g., Suh, Diener, Oishi, & Triandis, 1998). Similar effects may therefore be found in other

migrants who move to a culture that is higher in individualism compared to their home culture. However, in a move to a more collectivistic culture, the two processes are likely to push in opposite directions and therefore may cancel each other out. Specifically, the migrant moving to a more collectivistic culture may initially see that locals' behaviour is not predictable and therefore strong belief in social complexity may be adaptive and lead to increases in the importance of self-direction. However, such potential changes in values push the migrant's values to be less compatible with the host culture's values, which is potentially not adaptive. Hence, there may be forces that operate in opposite directions in such migration, impeding the chances of replicability of our results in a move to a more collectivistic culture. Similar structural factors might operate for migration for particular groups and follow the same logic -- a migrant moving to a company with a highly individualistic culture may benefit more from holding beliefs which encourage individualism compared to a migrant joining a more collectively orientated organisation. This could be profitably examined in future empirical research.

Our paper focused on one social axiom. Could other social axioms be related to migration and potentially have reciprocal relations with values? We chose focusing on social complexity on a theoretical basis, because we believe that this social axiom has the clearest relevance to this life transition across segments of the migrant population. It is likely that the novelty in social environment challenges to some extent social complexity beliefs of all migrants. In contrast, the social axiom of reward for application, for example, may be most relevant to migrants who work and have work ambitions in the new place. Our paper demonstrated theoretically meaningful longitudinal effects, from both beliefs to values and from values to beliefs. Future research should examine longitudinal reciprocal effects between other values and beliefs in pertinent contexts and cultural settings, allowing us to more fully

understand the roles placed by socialization agents and other physical and environmental structures (Leung & Zhou, 2008).

Every longitudinal study is inevitably confronted with the problem of sample attrition, more so the study of immigrants who frequently change their location and can be difficult to trace in consecutive data collections. In our study, our sample included respondents who had higher social complexity and universalism than sample dropouts. Given that sample attrition was probably partly due to respondents returning to Poland, this result is compatible with the idea that social complexity and universalism are adaptive in new environments. However, it is unlikely that this sampling bias would influence the relationship between the variables under study.

In their review paper, Leung & Bond (2004) suggest a need for the integration of the two frameworks of values and social axioms. Previous studies of values and beliefs have demonstrated that such individual values and beliefs are only weakly correlated, but have focused on single, cross-sectional analyses of these relationships. Our analyses suggest such relations are far more dynamic, likely informed by a host of opportunities and challenges faced by significant life transitions, such as moving to a new culture. Leung and Zhou (2008) offer several possible explanations for the overlap between social axioms and values. We would suggest that the absence of the contemporaneous correlations between axiom and values in our results support the notion that direct experiences have a significant impact on the relationship between values and beliefs. Our findings underlie the need for longitudinal analyses of these pivotal notions, and suggest a complex inter-relationship between different dimensions of self-concept in novel situations.

As values and beliefs can be seen as part of personality, our findings also have implications for research on personality change. The field of personality has seen heated debates on whether personality is fixed or changeable. Costa and McCrae (e.g., Costa &

McCrae, 1994; McCrae et al., 2000) have consistently argued that personality is generally stable in adulthood; the only changes are attributable to maturation, and therefore personality does not change as a result of life events. Others, however, have argued that personality is likely to change as a function of life events and changing life roles, and have reported findings that support this argument (e.g., Helson, Kwan, John, & Jones, 2002; Roberts & DelVecchio, 2000; Srivastava, John, Gosling, & Potter, 2003). Our results add to the accumulating findings of the latter view. Specifically, although we found quite high stability in values across time, we also found meaningful changes throughout our studied life transition. Moreover, similar to some recent findings (e.g., Bleidorn et al., in press; Roberts, O'Donnell, & Robins, 2004), we found reciprocal effects of different aspects of the personality, thereby strengthening the view that although personality has a strong element of consistency, it is also flexible and responsive both to changes in the social environment and to changes in other elements of the personality.

Summary and Conclusion

Previous work on values and beliefs has treated these as two potentially complementary individual constructs, but has not explored the dynamic relations between the two over time. Migrants to a new culture - and indeed all those faced with major life transitions – confront a number of challenges and opportunities that provide a valuable crucible for the examination of such value and belief change. In our longitudinal study of Polish migrants, we identified cross-lagged relationships from values to the social axiom of social complexity, and relationships from social axioms to values over time. Future work should aim to examine such contextually relevant drivers as we strive to understand the dynamic interplay between various aspects of personality.

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Table 1: Pearson Correlations between Values and Social Complexity at Times 1, 2 and 3.

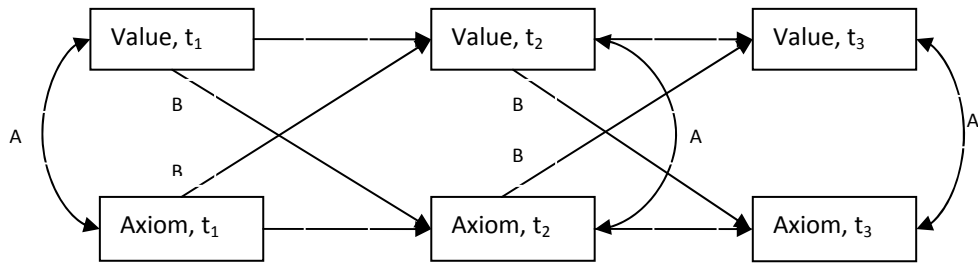
		Tradition			Self-Direction			Universalism				
		M	SD	T1	T2	T3	T1	T2	T3	T1	T2	T3
Social Complexity	T1	4.14	0.71	-.15	-.20*	-.23*	.10	.24**	.33*	.12	.09	.08
	T2	4.11	0.72	-.18*	-.24*	-.25*	.16*	.18*	.26*	.15*	.03	.07
	T3	4.03	0.87	-.23**	-.22**	-.22*	.20**	.29**	.32**	.20**	.09	.15*
Tradition	T1	-0.66	0.83	-	.68**	.65**	-.42**	-.35**	-.30**	.11	.11	.10
	T2	-0.65	0.88		-	.73**	-.35**	-.47**	-.38**	.04	.09	.09
	T3	-0.60	0.87			-	-.38**	-.38**	-.43**	.06	.09	.14
Self-Direction	T1	0.59	0.58				-	.51**	.48**	.03	.01	.00
	T2	0.66	0.60					-	.60**	.03	.00	-.04
	T3	0.71	0.63						-	.18*	.17*	.16*
Universalism	T1	0.41	0.62							-	.64**	.62**
	T2	0.41	0.59								-	.67**
	T3	0.42	0.65									-

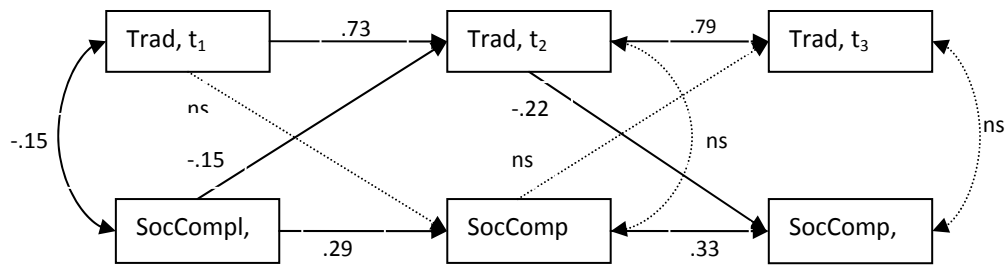
Note: Significance level: ** $p < .001$; * $p < .05$. Values were centered within individuals prior to all computations, so means presented in the table are the means of the centered variables.

Figure Captions

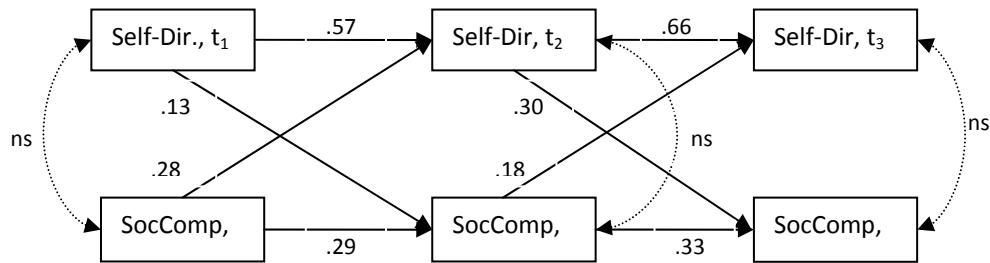
Figure 1. The cross-lagged panel design used in the study. ‘A’ paths are contemporaneous correlations, while the ‘B’ paths represent cross-lagged (or longitudinal) effects.

Figure 2. Three SEM models: Cross-Lagged Relations between Tradition (Trad) and Social complexity (SocCom), Self-Direction (Self-Dir) and Social complexity, Universalism (Univ) and Social complexity at three time points (T_1 , T_2 , T_3). All reported coefficients were significant $p < .01$.

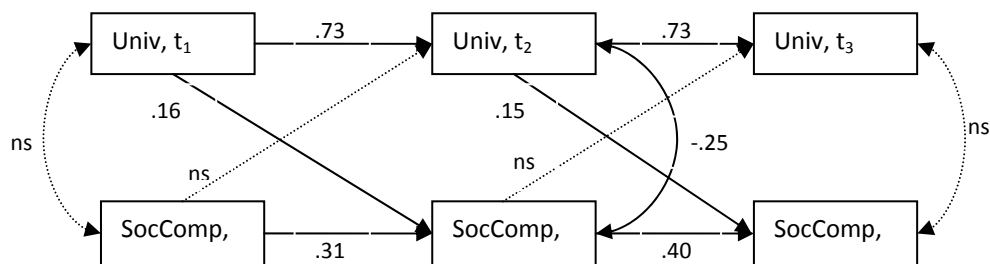




$\chi^2 = 17.93, df = 9, p = 0.04; CFI = 0.95, RMSA = 0.07$



$\chi^2 = 19.53, df = 11, p = 0.05; CFI = 0.95, RMSA = 0.07$



$\chi^2 = 18.80, df = 10, p = 0.04; CFI = 0.96, RMSA = 0.07$