DEVELOPMENT OF CULTURAL IDENTITY AND WELL-BEING OF IMMIGRANTS: ANALYSIS OF A LONGITUDINAL STUDY OF IMMIGRANTS TO GERMANY

By

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ABSTRACT

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Over 200 million people live in a country different from the one in which they were born. These immigrants face an important task of acculturation as they navigate through new values, customs, and attitudes of the new culture. An important part of acculturation involves changes in cultural identity (i.e., identification with the culture of the country of origin and the new culture). Past research has found that cultural identity is associated with well-being. To account for this finding, theories that assume a directional relationship between the two variables have been proposed. However, virtually no studies have followed immigrants over time to evaluate whether changes in life satisfaction and identity affect each other, and how life satisfaction and identity evolve over time for immigrants is not clearly understood. The current study used a sample of over 5,000 immigrants to Germany who reported on their life satisfaction and cultural identity over a period of 26 years. I examined trajectories of the two variables and used trait-state models to evaluate the extent to which each variable is influenced by stable and changing determinants. Life satisfaction of immigrants generally followed similar trajectory and had similar influences as life satisfaction in the general population. Identification with Germany increased over time, with most change occurring over the first decade following immigration. In addition, individual differences in cultural identity were highly stable over time, suggesting that cultural identity is largely determined by stable influences. The study replicated a positive association between identification with the host country and life satisfaction. The majority of the association was found at the stable level, suggesting common stable influences on both variables. Further

analyses indicated that some of the association between well-being and identity is accounted for by personality traits that influence both variables. After accounting for the relationship at the stable level, no prospective effects of cultural identity on life satisfaction (or life satisfaction on cultural identity) were found. However, country of origin, gender, and age of immigration moderated change in cultural identity and life satisfaction over time in meaningful ways.

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INTRODUCTION

Millions of people will at some point move from the country in which they were born to start a new life someplace else. As of 2010, over 200 million people did not live in their country of birth. Close to 10% of European and 15% of North American population is made up of immigrants to countries of these two geographical areas (United Nations Department of Economic and Social Affairs, 2011). As diversity in countries' populations continues to rise, issues of well-being of immigrants are becoming increasingly important. In last year's report however, the American Psychological Association's Presidential Task Force on Immigration (2012) noted a gap in research that focuses on well-being of immigrants and pointed to the urgent need for research to examine the effects of culture change on immigrant populations.

Immigration and identity change

Moving to a new country and starting a life in a new and possibly unfamiliar culture is a major life change that has a potential for profound effects on well-being. Just like other life transitions, the process of immigration involves many challenges such as finding employment, becoming familiar with new situations or surroundings, and developing new social networks. In addition, immigrants are faced with the unique challenge of acculturating into the new society as they encounter new cultural customs, values, attitudes, and language. *Acculturation* refers to psychological and behavioural changes that occur whenever two or more cultures come together, as they do in the context of immigration (Berry, 1997; Graves, 1967). An important part of acculturation involves changes in people's cultural identity – their sense of belonging to a group or culture (Phinney, 1990). These changes may occur in one's *national identity* – identification with the host culture; they may also occur in one's *ethnic identity* – identification with the culture of the country of origin. Theoretically, national and ethnic identities are conceptualized as

independent, although the actual relationship between the two may vary across ethnic groups and host cultures (Phinney, Horenczyk, Liebkind, & Vedder, 2001).

Role of identity in immigration policies

Policy makers see changes in cultural identity as an important step in becoming a naturalized citizen of a country to which one has immigrated. Identification with the host society is considered important for its national unity, even in countries that encourage their citizens to continue to be active participants in the culture of their country of origin (Walters, Phythian, & Anisef, 2007). Indeed, most developed countries include some requirement of identity change as a necessary step toward becoming a citizen. For example, language is considered to be one of the most important aspects of immigrant identity (Giles, Taylor, & Bourhis, 1977; Giles, Taylor, Lambert, & Albert, 1976; Leclezio, Louw-Potgieter, & Souchon, 1986; Taylor, Bassili, & Aboud, 1973), and language proficiency is the most common requirement for gaining citizenship (Wright, 2008). In addition, an increasing number of countries are requiring immigrants to have knowledge of and adhere to their value systems in order to gain citizenship status. France has recently instituted a law that requires prospective citizens to demonstrate a certain level of integration into the French society by demonstrating sufficient knowledge of French culture, society, and values (Library of Congress, 2011). Similar integration into host society's values are a part of citizen requirements of other countries such as Denmark (Adamo, 2008), Australia (Klapdor, Coombs, & Bohm, 2009), and the United States (U.S. Citizenship and Immigration Service, 2007).

Many countries have also taken a strong stance on whether they allow their naturalized citizens to hold onto identification with their country of origin. For example, Austria, Denmark, Japan, and the Netherlands generally require their naturalized citizens to give up the citizenship

of their birth country. Germany also does not allow dual citizenship, and a parliament member was cited saying that "an expression of successful integration means that a person decides for Germany" (Marsh, 2013). Although the United States does not legally require their citizens to renounce any other citizenships they may hold, its official stance is that dual nationality is not encouraged (U. S. Citizenship and Immigration Services, 2013). On the other hand, some countries such as Australia, Canada, and Switzerland allow their citizens to retain more than one nationality.

Clearly, the development of national identity is a common expectation of long-term immigrants. However, how such changes in identity affect well-being of people who settle in a new culture is not clearly understood, yet this information is important for governments who are becoming increasingly interested in using well-being indicators to judge quality of life of their residents (Diener, Lucas, Schimmack, & Helliwell, 2009). Indeed, a recent report by the Commission on the Measurement of Economic Performance and Social Progress noted limitations of the traditional indicator of national progress, the gross domestic product (GDP), suggesting that quality of life and well-being provided important additional information about the wellness of a nation (Stiglitz, Sen, & Fitoussi, 2009). Motivated by the report, the UK Prime Minister David Cameron announced plans to monitor the national state of well-being in order to guide government policy (Stratton, 2010). Similar plans are in place in France (Samuel, 2009) and Canada (University of Waterloo, 2011). As the immigrants represent a large proportion of come countries' populations, the effect of immigration policies on the well-being of immigrants can provide important information to the policy makers.

Although studies of cultural identity and well-being are plentiful, they fail to paint a picture of the relationship between the two variables for a number of reasons. First, large

majority of studies are focused on immigrants' sense of ethnic identity but very little is known about how national identity relates to well-being (Schwartz, Unger, Zamboanga, & Szapocznik, 2010). Second, the majority of research on this topic has been done with adolescent populations. Much of identity research is grounded in developmental perspectives that focus on adolescence as the time during which the majority of identity development occurs. However, many immigrants are adults who have themselves made the decision to immigrate, and these adults also face the challenging task of development of the new identity. Understanding how cultural identity is related to well-being in adult populations of immigrants should not be ignored. Third, existing research has almost exclusively relied on single-assessment studies (but see Phinney & Chavira, 1992 and Rogers-Sirin & Gupta, 2012 for longitudinal studies of identity and well-being of immigrants). In this paper, I address these gaps in literature by exploring the link between ethnic and national identity change and change in well-being over time in a longitudinal study of a large group of immigrants to Germany.

Subjective well-being

The question of what makes a life good has been of interest to philosophers throughout recorded history. Early thinking generally posited a number of conditions that must be satisfied in order to achieve well-being. For example, Aristotle claimed that pleasure was a necessary ingredient for good life (Aristotle, 1999). In psychology, several theories have proposed various essential needs that must be satisfied for a person to have a good life, such as love and belonging, self-actualization, esteem, and self-determination (e.g., Baumeister & Leary, 1995; Maslow, 1943; Ryan & Deci, 2000). However, such theories do not take into account the possibility that different people, or people from different cultures or at different time periods, may have different needs.

In contrast to this approach, well-being can be conceptualized as a subjective condition. *Subjective well-being* is defined as a person's overall evaluation of the quality of her or his life (Diener, 1984). Rather than defining the good life and then assessing how well people's lives fit this definition, subjective well-being research relies on people to make their own judgment of how well their lives are going. As such, this approach to studying well-being does not require a set of objective indicators that define well-being but may change over the course of history or lifespan, or across cultures. Instead, subjective well-being judgments are made by individuals upon consideration of what they believe is the most important in their lives (Schimmack & Oishi, 2005).

Traditionally, two components of subjective well-being – cognitive and affective – have been identified and studied. *Life satisfaction* is the cognitive judgment of the quality of life. Life satisfaction is typically assessed by asking people to reflect on the important aspects of their life and then rate their satisfaction with their life overall. *Affective judgments* involve reflecting on one's feelings – either in the moment or over longer periods of time. Cognitive and affective judgments tend to be related but also differ in important ways. For example, affective judgments are more directly influenced by biological processes and personality, whereas judgments of life satisfaction are more responsive to changes in life circumstances (Luhmann, Hofmann, Eid, & Lucas, 2012; Schimmack, Radhakrishnan, Oishi, Dzokoto, & Ahadi, 2002). In this paper I focus on changes in life satisfaction over time, which is appropriate because the experience of immigration involves major changes in life circumstances. The subjective nature of life satisfaction judgments make them desirable for study of well-being in a diverse group of individuals of different cultural backgrounds who have different experiences, values, and motivations.

Does well-being change?

An essential role of governments is to maintain and improve quality of life of the people. It has been argued that subjective well-being judgments can provide important information regarding people's quality of life for public policy makers (Diener et al., 2009). However, this information is only useful if well-being can actually change and thus be affected by government policies. Because understanding of stability and change can have such important implications, issues of stability of well-being have played a central role in research in this topic.

Early researchers suggested that life satisfaction is highly influenced by stable personality traits and thus resistant to change over time (Lykken & Tellegen, 1996). Several theories reflected this notion by suggesting that even the most extraordinary events, such as winning the lottery or becoming severely disabled would have only transient but not long-lasting effects on well-being (e.g., Brickman & Campbell, 1971; Frederick & Loewenstein, 1999; Headey & Wearing, 1989). However, more recent work with longitudinal data has concluded that, contrary to predictions of set-point theories, some important life events are associated with long-lasting changes in well-being. For example, people's life satisfaction tends to decline after onset of disability, and more severe disability is associated with larger drops in life satisfaction (Lucas, 2007). Life satisfaction also declines after loss of a spouse (Lucas, Clark, Georgellis, & Diener, 2003; Yap, Anusic, & Lucas, 2012). Although people show some adaptation to these events, their life satisfaction, on average, does not return to the pre-event levels. Well-being also changes over the lifespan, such that people on average report higher life satisfaction in early and older adulthood, and lower satisfaction in mid-adulthood (Baird, Lucas, Donnellan, 2010; Blanchflower & Oswald, 2008; Deaton, 2008). However, people may follow different paths of change, as rank-ordering of life satisfaction also changes to some degree over time, meaning that

those who are most satisfied with their life at some point may not necessarily stay the most satisfied later on (Lucas & Donnellan, 2007).

Therefore, research suggests that life satisfaction does indeed change over time, and that these changes meaningfully correspond to important changes in life circumstances. A continuing goal in research on well-being is to identify events that lead to lasting changes and to understand the mechanisms behind these changes. In this paper, I will look at a major life event shift that occurs with immigration and the well-being trajectories of immigrants as they continue their new lives within a new society. I will then explore one potential reason for well-being change in immigrants – changes in cultural identity, which includes both changes in ethnic identity (i.e., identification with the culture from the country of origin) and development national identity (i.e., identification with the new culture). In addition, I will explore the dynamics in the relationship between these variables by also examining the extent to which changes in well-being may foster or hinder changes in cultural identity.

Theories of immigrant identity and well-being

There is a strong sense in social psychological research that identity is linked to well-being. Recently, two meta-analyses have examined the link between cultural identity and well-being and found small but consistent relationships between these variables (Nguyen & Benet-Martínez, 2013; Smith & Silva, 2011). Smith and Silva's (2013) analysis was specific to ethnic identity of people of colour in Canada and the United States, which included recent immigrants and individuals born in these two countries. In this context, ethnic identity was conceptualized as the feeling of being included and aligned with an ethnic group. The authors found a positive overall relationships (r = .17) between ethnic identity and well-being, and this relationship was stronger for self-esteem and global well-being judgments than for ratings of symptoms such as

depression or anxiety. Nguyen and Benet-Martínez (2013) included a broader range of studies and examined both ethnic and national identity of immigrants and descendents of immigrants residing across the world. They found a relationship between both ethnic identity (mean r = .11) and national identity (mean r = .13) and well-being. Nguyen and Benet-Martínez (2013) also found that the effects of these different aspects of cultural identity are additive, as the relationship between biculturalism (i.e., strong sense of both ethnic and identity) was more strongly related to well-being than either aspect of identity alone. Two theories have traditionally been used to explain the relationship between well-being and cultural identity: a theory on acculturation strategies (Berry, 1989, 1997) and the social identity theory (Hogg & Abrams, 1999; Tajfel & Turner, 1979)

Theory of acculturation strategies

Nguyen and Benet-Martínez's (2013) idea of biculturalism as especially important for well-being draws from previous work on acculturation strategies that function to maintain and develop cultural identity. Berry (1980, 1997) identified two dimensions of acculturation: maintenance of culture of the country of origin and involvement with the new culture. These dimensions conceptualized as independent and thus give rise to four acculturation strategies that may apply to immigrants. *Integration* strategy involves both maintenance of the original culture and identity and involvement in the new culture and development of new identity. People who adopt the *assimilation* strategy tend to become involved and identified with the culture of their new home and largely give up their old identity and culture. In contrast, those who adopt the *separation* strategy cling to their ethnic identity and cultural customs and avoid contact with the new culture and development of national identity. The strategy of *marginalization* involves giving up the old culture and not pursuing identification with the new culture.

According to Berry (1997), maintenance of cultural identity is crucial to well-being of immigrants. Therefore, strategies that embrace at least one cultural identity should result in higher well-being than marginalization strategy. Indeed, research that has linked these acculturation strategies with well-being suggests that people who pursue integration strategy report highest levels of well-being, whereas those who pursue marginalization strategies report lowest levels. Assimilation and separation strategies are associated with well-being levels that fall in between these two extremes (e.g., Berry & Sam, 1996; Berry, Phinney, Sam, & Vedder, 2006). Thus, the effects of cultural identity appear to be additive – maintaining one identity (i.e., ethnic or national) is better than feeling that one does not belong to any cultural group, but embracing both ethnic and national identity is associated with best outcomes. Although the reasons for these associations are still unclear, researchers have suggested that identification with any cultural group can provide resources such as social support, which have been linked to higher well-being (Argyle, 2001; Berry, 1997; Myers, 1992). On the other hand, societies that provide the resources for immigrants to integrate into their society and those in which immigrants do not feel marginalized or discriminated against may also nourish well-being in their immigrants who in turn will have the ability and desire to maintain their ethnic identity and/or strengthen their national identity.

Social identity theory

Another prominent theory, social identity theory (Hogg & Abrams, 1999; Tajfel & Turner, 1979) has been used to explain the positive association between cultural identity and well-being. According to this theory, identity is defined by group membership. As such, people's self-evaluations and well-being are closely tied to evaluations of their group. Social identity theory also posits that people are motivated to maintain high levels of well-being. If a group is

evaluated negatively, the well-being of their group members will be low. In this case, people will be motivated to distance themselves from that group and align themselves with a more positively evaluated group. Although this may not always be possible (e.g., in cases of discrimination that targets visible minority group members), in the context of immigration this can be accomplished by acculturation. A perception of a person as a foreigner (and with that, a negative evaluation of her or him) can be minimized as one begins to identify with the culture of the host country, learns and adopts the language and values of this culture, and develops the social networks that include members of the new cultural group, while distancing oneself from the culture of the country of origin. Accordingly, adopting the new identity and becoming a member of the more positively evaluated group would lead to well-being increases.

Assumptions about the structure of cultural identity

In sum, two prominent theories explain a relationship between cultural identity and well-being. However, they differ in their assumptions about mutual inclusiveness or exclusiveness of ethnic and national identity, leading to differing predictions. Both theories predict that increases in national identity should lead to increases in life satisfaction over time. However, the theory of acculturation strategies emphasizes independence of two types of cultural identity and the importance of resources that are available if both national and ethnic identity are developed and maintained. On the other hand, social identity theory assumes mutual exclusiveness of belonging to ethnic and national cultural groups. Because one of these groups is always judged more positively than the other, development of one identity and distancing from another should be more favourable for well-being.

Most theoretical approaches to identity assume two independent dimensions of cultural identity – ethnic and national identity (Berry, 1997; Phinney et al., 2001). However, this

relationship likely varies in different host societies. In countries that support biculturalism (e.g., Canada), immigrants are likely to maintain their ethnic heritage and develop stronger ties with the host culture over time, whereas in countries that have official policies against biculturalism (e.g., Germany) it is necessary for immigrants to distance themselves from their culture of origin in order to fit in and advance in the host culture. Thus, policies and climates of different countries likely affect the dynamics between ethnic and national identities. Social identity theory may be particularly relevant in countries that do not favour biculturalism. However Berry (1997) explicitly states that even in such countries integration strategy, in which both national and ethnic identity are developed and maintained, should result in higher well-being. Accordingly, immigrants would benefit from preservation of their ethnic identity despite host culture's push for assimilation. The current study explores the development of well-being and cultural identity in Germany. German officials have been explicit about their view that multiculturalism is a not a desired goal for Germany (Marsh, 2013; Connolly, 2010). Indeed, in a report that evaluated 21 developed countries on a number of policies aimed at multiculturalism, Germany scored 13th, receiving 2.5 out of 8 points (1 point per multicultural policy implemented; Tolley, 2011). Thus, I will be able to evaluate the structure of cultural identity and how it relates to well-being in this context.

Limitations of previous work on cultural identity and well-being

The predictions of the acculturation strategies theory and the social identity theory are essentially about how each of the variables (cultural identity and well-being) affects future changes in the other. As such, tests of these predictions require longitudinal data. At the present time, little is known about the association between cultural identity and well-being over time because studies have generally used single-assessment design to study this topic. Two exceptions

are studies by Phinney and Chavira (1992) and Rogers-Sirin and Gupta (2012). However, because of small samples and limitations of the methods used, even these studies provide only limited insight into the relationship between identity and well-being over time.

The sample of Phinney and Chavira's (1992) study comprised a group of 18 American-born adolescents from visible minority groups who were interviewed at ages 16 and 19. At both time points, ethnic identity was assessed by coding recorded in-person interviews and assigning participants into one of three stages of ethnic identity development: diffusion/foreclosure (i.e., unexplored identity), moratorium (i.e., exploration stage, characterized by confusion about one's ethnic identity), or achieved (i.e., possessing clarity, understanding, and acceptance of one's ethnic identity) (Phinney, 1989). The authors found that ethnic identity changed over time as most participants moved from a less developed to a more developed identity stage over time. The authors also examined over-time correlations between ethnic identity and self-esteem. They found that ethnic identity and self-esteem were positively related to each both at the same time points and over the three-year interval, and concluded that there is evidence of prospective causal relationship of both identity and self-esteem on the other variable. Limitations of using cross-lagged correlations to infer causality have been pointed out by Rogosa (1979) – for example, this method confounds correlations between variables over time with over-time stability of the variables.

A study by Rogers-Sirin and Gupta (2012) assessed 171 Asian and Latino adolescents who were first- and second-generation immigrants to the United States. They assessed ethnic identity in 10^{th}, 11^{th}, and 12^{th} grades with questions such as "In general, I'm glad to be a member of my racial/ethnic group," and "In general, belonging to my race/ethnicity is an important part of my self-image." In the same years, they assessed national (American) identity

with questions such as “I often regret that I belong to the mainstream American society,” and “The American society I belong to is an important reflection of who I am.” Retest correlations over one- and two-year interval were .57 and .38 for ethnic identity, and .53 and .30 for national identity. The authors found that both ethnic and national identity changed over time, increasing in the first year of study and decreasing somewhat over the second year of study. The authors evaluated the relationship between cultural identity and two well-being indicators: withdrawn/depressed behavious (e.g., “I keep from getting involved with others”) and somatic complaints (e.g., “I feel dizzy or lightheaded”). Both withdrawn/depressed behaviours and somatic complaints decreased over time. Furthermore, when cultural identity variables were included as time-varying predictors of well-being, ethnic identity was negatively related to withdrawn/depressed behaviours and somatic complaints, whereas the relationship between well-being and national identity was not significant. Thus, in the years in which students reported a stronger sense of ethnic identity, they also reported experiencing less negative symptoms. The authors concluded that changes in ethnic (but not national) identity serve as a protective factor against mental health symptoms. However, it is unclear from this design whether changes in identity lead to higher well-being, or whether people who were better off were the ones who were able to strengthen their identity.

Longitudinal models of change

An important limitation of observational or correlational (vs. experimental) data is the ambiguity of causality. A correlation between two variables (e.g., cultural identity and well-being) could arise because variable one has a causal effect on variable two (e.g., strengthening cultural identity leads to increases in well-being), variable two has a causal effect on variable one (e.g., people who are high in well-being are willing or able to strengthen their cultural identity),

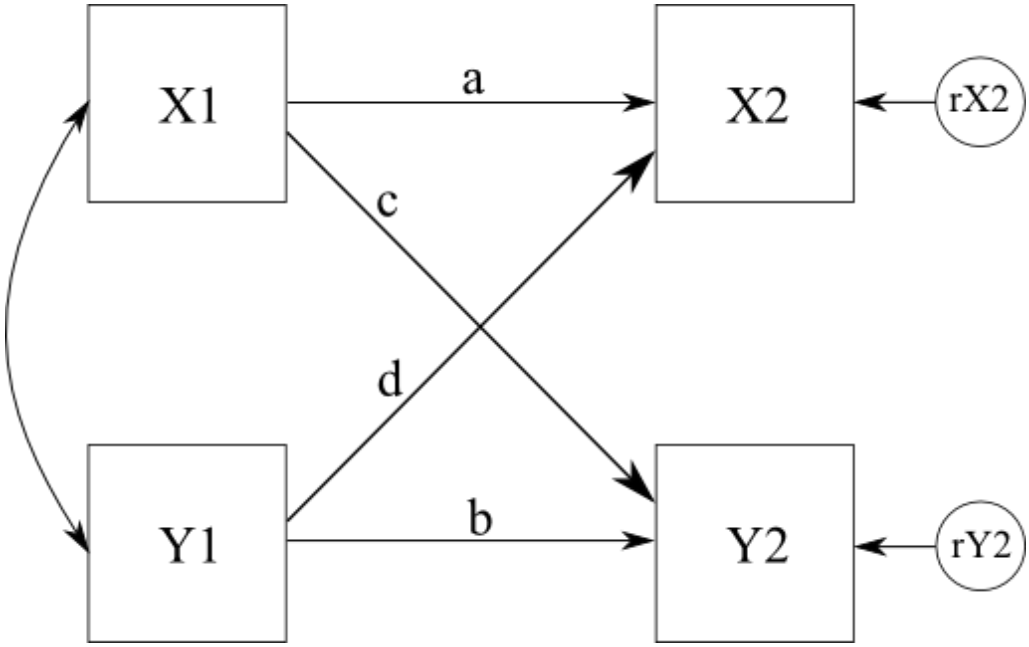
or a third (unobserved) variable has a causal effect on both observed variables (e.g., host countries that treat their immigrants well may have immigrants with high well-being and strong cultural identity). An important feature of longitudinal data is that it is time-ordered, and thus can be used to rule out certain causal relationships. Because time flows in one direction, a person's state on one variable at some point in time cannot influence her or his earlier state on another variable (of course, longitudinal designs still cannot rule out causal effects of other, unobserved variables).

From this reasoning, cross-lagged panel models have been developed and used to test directional causal relationships between variables. These variables specify an autoregressive function for each variable, and also allow cross-lag relationship across variables. Figure 1 shows an example of a simple cross-lagged model with two variables and two measurement occasions. According to this model, a person's standing on each variable can be predicted from her or his previous standing on that variable (paths *a* and *b*, which reflect stability) and from her or his previous standing on the other variable (paths *c* and *d*).

An important limitation of the autoregressive cross-lagged panel model is that it does not take into account certain trait-like stability in individual differences often observed for psychological constructs. In addition to autoregressive effects, which imply some level of stability in constructs from one measurement occasion to the next, trait-state models posit that individual differences are also to some degree stable over very long periods of time, even indefinitely (Cole, Martin, & Steiger, 2005; Eid & Diener, 2004; Kenny & Zautra, 1995; Kenny & Zautra, 2001; Steyer, Schmitt, & Eid, 1999). Thus, these models tend to separate three types of influences on psychological variables. Trait-like influences produce indefinite stability over time, and include factors such as genes, personality, and stable environmental factors. Autoregressive

influences produce slow changes over the lifespan. Occasion-specific influences are responsible for short-term changes that are seen from one measurement occasion to the next and include measurement error.

Figure 1
Cross-lagged autoregressive model over two measurement occasions



Separating trait-like influences from autoregressive influences may have important implications for testing cross-lagged paths in longitudinal studies of two variables. An association between two variables may indeed indicate that one variable affects changes in another variable (or both variables affect changes in each other), as would be implied by cross-lagged paths, yet it is also possible that the relationships between the two variables is entirely (or in part) at the trait level. Thus, some stable influences may be responsible for the observed relationship between cultural identity and well-being. For example, both life satisfaction and identity exploration and achievement are related to extraversion (Clancy & Dollinger, 1993;

Steele, 2008). The association between identity and well-being may be explained by individual differences in extraversion without the need to refer to unique causal effects among the two variables (I should note that personality may not be the sole influence on this relationship; other stable attributes of the person or the environment may also have a role).

This issue can be illustrated by a study by Luhmann, Schimmack, and Eid (2001) that used a bivariate trait-state model to show that the association between income and well-being is primarily due to stable factors that influence these two variables. Although prior studies have suggested cross-lagged effects of well-being on income, these effects become negligible once stable influences are taken into account. Similarly, Cole, Nolen-Hoeksema, Girgus, and Paul (2006) used trait-state models to test hypotheses about associations between stressful events and depression. Although traditional cross-lagged models suggested that depression increased likelihood of experiencing stressful events, trait-state models suggested that most of this association was driven by the influence of trait depression on stress. After accounting for trait associations between depression and stress, cross-lagged paths between these variables were substantially reduced.

In this study I use a state-trait model to study cultural identity and life satisfaction, and the relationship of the two over time, in immigrants to Germany. This model can tell us about the relative contribution of stable and changing factors on these two variables, and whether the association between them is driven by individual differences at the trait level (e.g., personality, stable environmental factors), or by factors that change. Thus, the model can describe both stability and change over time, while allowing for tests of predictions about causal relationships between cultural identity and well-being made by Berry's (1980, 1997) theory of acculturation strategies and the social identity theory.

The present study

The purpose of the present study is to examine the relationship between cultural identity and life satisfaction by using longitudinal data and models that can allow us to make more informative causal inferences about the association between these two variables. For this study I will use data from a large panel study of German residents – the German Socio-Economic Panel Study (GSOEP). This dataset contains 26 years of data on over 40,000 participants. Although the data are largely representative of the German population, immigrants are oversampled resulting in a large sample of first-generation immigrants. Questions about cultural identity satisfaction are included throughout the study. Thus, these data provide a unique opportunity to test predictions about well-being of immigrants that are made by dominant theories in the literature. The main goal of this study is to understand the development of cultural identity and changes in life satisfaction of immigrants. In addition, it has been proposed that certain demographic characteristics (age at immigration, gender, country of origin) may affect adaptation of immigrants (Berry, 1997; Phinney et al., 2001), and in this study I will test whether there are group differences in trajectories and sources of influence on cultural identity and life satisfaction. The following are the specific aims of the study that will contribute to this goal.

Aim 1: Describe developmental trajectories of life satisfaction, ethnic identity, and national identity of immigrants to Germany.

What is the trajectory of life satisfaction of people after they move to a new country? How does the sense of ethnic and national identity change over time? I will study these issues by modeling mean-level changes that occur in these variables over time. Very little is known about trajectory of cultural identity over time – studies have generally found that ethnic and national identity were stronger in immigrants who have been living in the new country for longer time

periods, but these findings are typically drawn from cross-sectional studies (e.g., Berry et al., 2006).

Aim 2: Identify contribution of stable and changing influences on life satisfaction, ethnic identity, and national identity.

To what extent are individual differences in life satisfaction and cultural identity stable and to what extent do they change? To answer this question I will use trait-state models that can tell us about the sources of individual differences in these variables. Virtually nothing is known about rank-order stability of cultural identity, and the present study will provide first evidence about the extent to which this construct can be thought of as trait-like or state-like.

Aim 3: Evaluate the source of association between cultural identity and life satisfaction.

To what extent is the association between cultural identity and life satisfaction driven by stable factors or factors that change over time? I will explore this by using bivariate state-trait models in order to separate stable influences on life satisfaction and cultural identity from those that change. This information is important for making inferences about causal relationships between these variables.

Aim 4: Test whether cultural identity predicts changes in life satisfaction, and whether life satisfaction predicts changes in cultural identity.

Berry's (1980, 1997) theory of acculturation strategies and the social identity theory make specific predictions about the effect different aspects of cultural identity and life satisfaction, and the effect of life satisfaction on two aspects of cultural identity. The acculturation strategies theory predicts that strengthening both ethnic and national identity would lead to increases in life satisfaction, whereas the social identity theory predicts the only national identity increases would lead to increases whereas increases in ethnic identity would lead to

decreases in life satisfaction. Both theories predict that higher life satisfaction would lead to increases in ethnic identity, but the theory of acculturation also predicts a positive effect of life satisfaction on strengthening of national identity, whereas the social identity predicts a negative effect. These predictions will be tested with a bivariate trait-state model, which can test whether these cross-laggged associations endure after accounting for stable associations between ethnic identity and life satisfaction.

Aim 5: Explore group differences in trajectories, stable and changing influences, and sources of association between ethnic and cultural identity and life satisfaction.

Do the development of cultural identity and life satisfaction and the association among these variables differ for people of different origin cultures, gender, or age? To answer this I will fit a series of multiple group models that will test whether these groups differ with respect to (1) trajectories of cultural identity and life satisfaction, (2) extent to which stable and changing influences affect these two variables, and (3) sources of association between identity and well-being.

METHOD

Sample Selection

Data for the analyses come from a large panel study that has used scientific sampling methods to approximate a nationally representative sample of residents of Germany (GSOEP). Data collection in the GSOEP is ongoing on annual basis, with the first wave occurring in 1984. The latest wave available for these analyses occurred in 2009. The GSOEP sample selection design included multistage random sampling techniques, by which various locations within Germany were selected first, and then households were randomly selected within these locations. All household members who were at least 16 years of age were asked to participate. Additional information about sampling and data collection can be found in the Desktop Companion to the German Socio-Economic Panel (Haiske-DeNew & Frick, 2005).

Over time, the GSOEP has recruited several different subsamples, each of which includes different proportion of immigrants to Germany. At the start of the study (in 1984), in addition to a random sample of residents of West Germany (Sample A), households that included a person from one of five most commonly represented ethnic groups who in Germany (Turkey, Yugoslavia, Spain, Italy, and Greece) were oversampled (Sample B). A separate sample households whose head was a citizen of East Germany was added in 1990 (Sample C). Through 1994 and 1995, a new sample that targeted immigrants was added to the study – this sample surveyed households in which at least one member had immigrated to West Germany after 1984 (Sample D). Since then, three refreshment samples similar in characteristics to Sample A were added in order to account for attrition (Samples E, F, and H in 1998, 2000, and 2006, respectively), as well as sample that oversampled high-income households (Sample G in 2002).

For the final sample for this study I selected individuals from all GSOEP subsamples who (a) were born outside of Germany, (b) did not consider themselves to be Germans living abroad prior to moving to Germany, (c) reported the year of immigration to Germany, and (d) rated their life satisfaction or identity in at least one wave. This final sample included 5,046 individuals (48% women) who immigrated to Germany between 1954 and 2008. On average, participants immigrated to Germany when they were 22.6 years (*SD* = 11.7 years, range = 0-83 years). Full information about demographic characteristics of the sample can be found in Table 1.

Table 1
Demographic characteristics of the overall sample

	M	*SD*	Range
Year of birth	1954	15 years	1902-1991
Year of immigration	1976	11 years	1954-2008
Age at immigration	22.6 years	11.7 years	0-83 years
	N	%	
Gender			
Women	2445	48.5	
Men	2601	51.5	
Sample			
A: West Germany	333	6.6	
B: Immigrants (five most represented groups)	3679	72.9	
C: East Germany	50	1.0	
D: Immigrants since 1984	287	5.7	
E: Refreshment	73	1.4	
F: Refreshment	525	10.4	
G: High income	52	1.0	
H: Refreshment	47	0.9	
Country of origin			
Turkey	1599	31.7	
Former Yugoslavia	821	16.3	
Italy	690	13.7	
Greece	497	9.8	
Spain	412	8.2	
Poland	119	2.4	
Eastern Europe	103	2.0	
Austria	58	1.1	
USA	42	0.8	
Russia	42	0.8	

Table 1 (cont'd)

	N	%
Romania	40	0.8
France	34	0.7
Albania	33	0.7
Great Britain	27	0.5
Iran	27	0.5
Czech Republic	26	0.5
Holland	23	0.5
Hungary	21	0.4
Ukraine	21	0.4
Portugal	20	0.4
Philippines	18	0.4
Bulgaria	16	0.3
Albania	15	0.3
Switzerland	13	0.3
Kazakhstan	13	0.3
Vietnam	12	0.2
Lebanon	11	0.2
Eritrea	10	0.2
Thailand	9	0.2
Canada	9	0.2
Iraq	8	0.2
Brazil	8	0.2
China	8	0.2
Other	234	4.6
Not reported	7	0.1

Measures

Life satisfaction. Every wave of the study included a single-item measure of life satisfaction. The measure asked participants to rate the degree to which they were satisfied with their life as a whole on a scale from 0 (*totally unsatisfied*) to 10 (*totally satisfied*). Single-item measures are sometimes (legitimately) criticized because of issues of reliability, validity, and ability to capture breadth. However, empirical literature suggests that these issues do not create major psychometric problems in the case of life satisfaction measurement. For example, using longitudinal models fit to the GSOEP data, Lucas and Donnellan (2012) estimated reliability of the single-item life satisfaction measure to be around .74. Regarding concerns of breadth,

although life satisfaction measures assess a broad topic (a person's life as a whole), the judgment itself is a relatively narrow construct. Indeed, existing multiple-item scales that assess life satisfaction often simply include several subtle variations in wording of the single item used in this study (see for example Diener, Emmons, Larsen, & Griffin, 1985). In addition, recent evidence suggests that single-item and well-established multiple-item measures of life satisfaction correlate similarly with external predictors (e.g., health, domain satisfaction, affect), suggesting that single-item measures are appropriate for use in research (Cheung & Lucas, 2013). I estimated means and standard deviations (within- and between-person) by fitting an intercept-only multilevel model that allowed variation in the intercepts at the between-person level to all available life satisfaction data in the overall sample. This information can be found in Table 2.

Table 2
Means and between- and within-person standard deviations for measured variables estimated by the intercept-only multilevel model

	M	*SD* (between-person)	*SD* (within-person)	*N* (people)	*N* (waves)
Life satisfaction	6.99	1.25	1.53	5,046	42,100
Foreign identity 1	4.26	0.68	0.76	3,077	13,644
German identity 1	2.01	0.77	0.77	3,073	13,458
Foreign identity 2	3.76	0.68	0.71	2,037	4,591
German identity 2	2.53	0.87	0.75	2,039	4,587
German language proficiency	3.06	1.00	0.53	4,496	21,763
Foreign language proficiency	4.29	0.55	0.57	4,491	21,635

Identity. Three different types of questions that were relevant to national and ethnic identity were asked at different points in the study: two types of questions directly assessed ethnic and national identity, but were asked at different points in the study, and the third type assessed identity indirectly by asking people about their language proficiency. Table 2 shows the

means and within- and between-person standard deviations estimated by the intercept-only multilevel model.

Direct questions about identity. Participants rated their German and foreign identity at various points in the study. At waves 2, 3, 4, 6, 8, 10, and 12, German identity was measured with the following item: "To what extent do you think of yourself as German?" (1 = *I feel totally German*, 2 = *I feel more German than not*, 3 = *I feel more German sometimes and less at other times, 4 = I feel hardly at all German*, 5 = *I don't feel at all German*). Foreign identity was assessed as an extension of this item, and it asked participants "And how foreign do you feel while living in Germany?"[1] (1 = *I feel totally foreign*, 2 = *I feel more foreign than not*, 3 = *I feel more foreign sometimes and less at other times*, 4 = *I feel hardly at all foreign*, 5 = *I don't feel at all foreign*). At waves 14, 16, 18, and 20 the questions were changed slightly. The wording of the German identity was the same ("To what extent do you think of yourself as German?") but the options became 1 = *Completely*, 2 = *For the most part*, 3 = *In some respects*, 4 = *Hardly at all*, 5 = *Not at all*. The wording of the foreign identity question in these later waves was "To what extent do you feel that you belong to the culture of the country where you or your family comes from" (1 = *To a very large extent*, 2 = *To a large extent*, 3 = *In some respects*, 4 = *Hardly*, 5 = *Not at all*). These variables were reverse-coded so that higher numbers indicated stronger sense of identity.

[1] Although the English translation available is translated "how foreign do you feel", the term "foreign" refers to identification with foreign (i.e., ethnic) identity, rather than feeling that one does not belong in Germany. The actual German version of the questionnaire reads: "Wenn Menschen längere Zeit in Deutschland leben, können sich die ursprünglichen Beziehungen zu Griechenland verändern. Wie ist das bei Ihnen, da Sie hier in Deutschland leben? Und wie sehr fühlen Sie sich hier in Deutschland noch als Grieche?", which translates into "When people live in Germany for a long time, the original relations with Greece can change. How much do you still feel Greek here in Germany?" (with references to Greece replaced with the appropriate country of origin).

Language proficiency. The most direct way to assess cultural identity available in the GSOEP is with identity variables described above. However, these variables are limited because their wording changed partway through the study. Another common way to measure cultural identity is by assessing language proficiency because language is one of the most important elements of ethnic identity (Phinney, 1990). The GSOEP assessed language proficiency in both German and participants' native language in 13 waves. Namely, speaking and writing proficiency was assessed in waves 1, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, and 22. Each time, participants were to assess how well they could speak and write in German and their native language (1 = *Very well*, 2 = *Good*, 3 = *Fair*, 4 = *Poorly*, 5 = *Not at all*). I recoded these variables so that higher numbers reflected more proficiency. Speaking and writing proficiency were highly correlated: r = .85 for German language and r = .70 for foreign language. Because of this, I averaged these two indicators into a single language proficiency variable for each language, with German language proficiency variable being the average of speaking and writing proficiency in German, and foreign language proficiency being the average of speaking and writing proficiency in native language. The correlations of speaking and writing variables with the aggregated language proficiency variable were .95 and .97, respectively for German language, and .88 and .95, respectively for foreign language.

Analytic Method

The major goals of my study were to (1) describe developmental trajectories of life satisfaction and cultural identity of immigrants, (2) identify contribution of stable and changing influences on life satisfaction and cultural identity, (3) understand sources of association between cultural identity and life satisfaction, and (4) explore group differences in trajectories and associations of these variables. Below, I first describe how I approached general analytic issues

(modeling time, modeling identity, group comparison), and then I describe the models used to address the four major goals.

Modeling time. In order to most appropriately capture development of identity and life satisfaction following immigration, time was modeled as number of years since arrival to Germany. In total, some data were available for the time period from the year of arrival (year 0) up to 60 years afterwards. However, data in the immigration year and the time period after 30 years were sparse and not available for all samples and age groups. Thus, I limited my analyses to the first 30 years of residing in Germany, starting with the first year following immigration (i.e., years 1 through 30).

Modeling identity. Correlations among the identity variables and life satisfaction (taken as means over all available waves for each person) are shown in Table 3. The pattern suggested that ethnic and national identity were not independent of one another in the sample of immigrants to Germany. The correlation between foreign and German identity was -.83 for the questions asked in the first part of the study and -.58 for the questions in the later part. In addition, three features of this pattern of correlations suggested that foreign language proficiency was not a good indicator of cultural identity. First, whereas German and foreign identity were negatively correlated for the two types of direct questions, German and foreign language proficiency showed only a small and positive correlation (.08). Second, German language proficiency was moderately correlated with the direct indicators of identity (absolute *r* ranged between .33 and .52), but the correlations with foreign language proficiency were much smaller (absolute *r* ranged between .08 and .27). Third, the correlations between identity variables and life satisfaction tended to be small, but in the direction of higher identification with Germany (i.e., less identification with the ethnic culture) being associated with more life satisfaction – yet

the correlation between foreign language proficiency and life satisfaction was in the opposite direction (r = .05). In addition, as can be seen in Figure 2, whereas people reported greater German language proficiency over time, foreign language proficiency stayed relatively stable, further suggesting that this variable may not be an ideal indicator of identity. For these reasons, I excluded foreign language proficiency from further analyses.

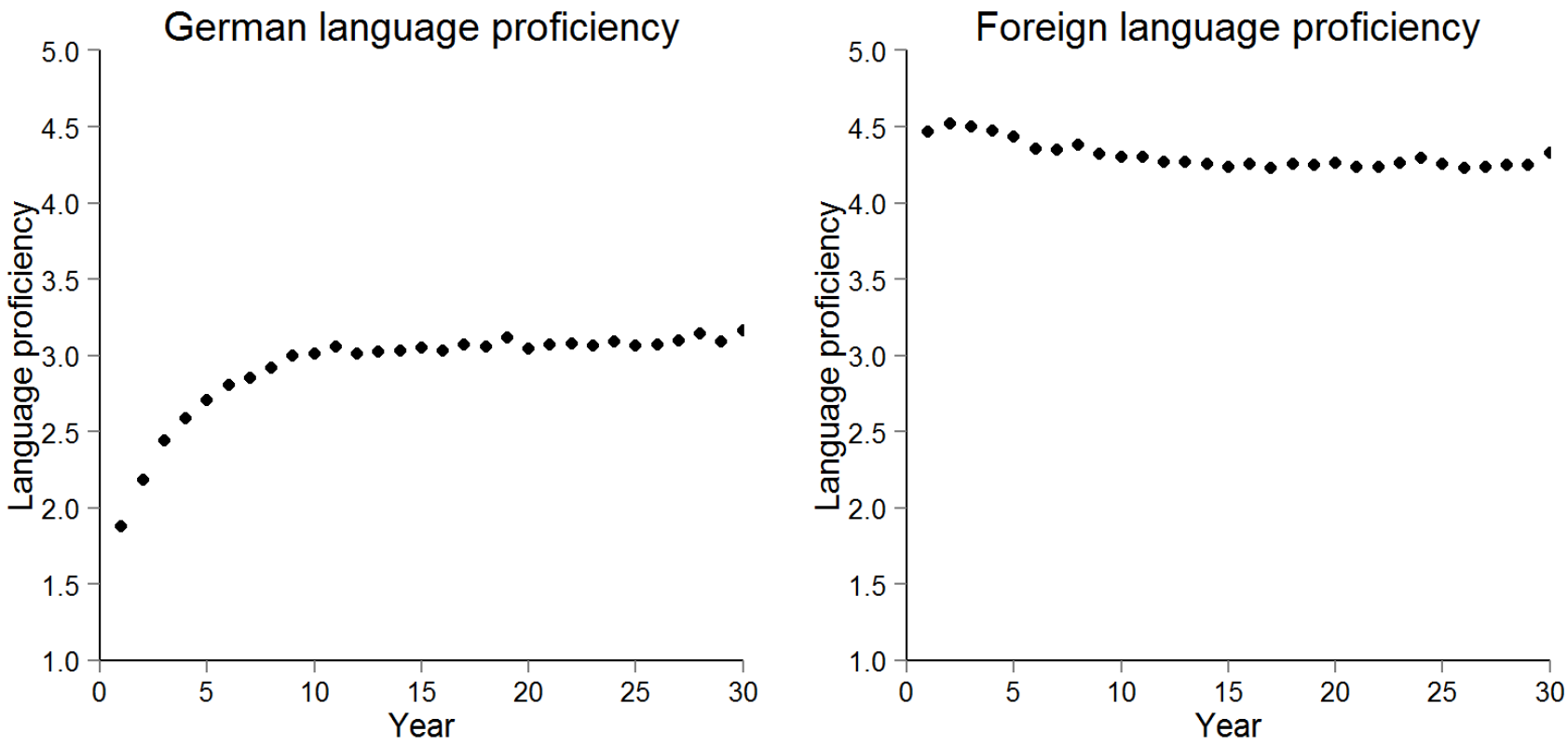
Table 3
Correlations between measured variables (averaged over the course of the study)

	1	2	3	4	5	6
1. Life satisfaction	–					
2. Foreign identity 1	-.06	–				
3. German identity 1	.08	-.83	–			
4. Foreign identity 2	-.02	.48	-.46	–		
5. German identity 2	.11	-.58	.64	-.58	–	
6. German language proficiency	.15	-.48	.52	-.33	.49	–
7. Foreign language proficiency	.05	.15	-.08	.27	-.16	.08

Identity was modeled at each measurement occasion as a latent variable that is reflected in ratings of the two foreign identity items, two German identity items, and German language proficiency variable. Because the identity questions changed over time, each person had data for only one foreign and one German identity item at any wave (and was missing data for the other foreign and German identity variables) – this made it necessary to constrain each variable's loadings on the latent variable to be equal over time. In addition, it was necessary to allow for method effects over time for each of the measured variables. I created a method factor for each variable by fixing its loadings at each wave to 1.0. I initially did this for each of the five variables. However, there were two issues that led me to modify this model.

First, this model had convergence issues. As Eid, Lischetzke, and Nussbeck (2006) pointed out, it is often necessary to model only N-1 method factors (where N is the number of indicators of the latent variable at each wave) in order to achieve convergence. Thus, I excluded

Figure 2
Mean observed scores for German and foreign language proficiency



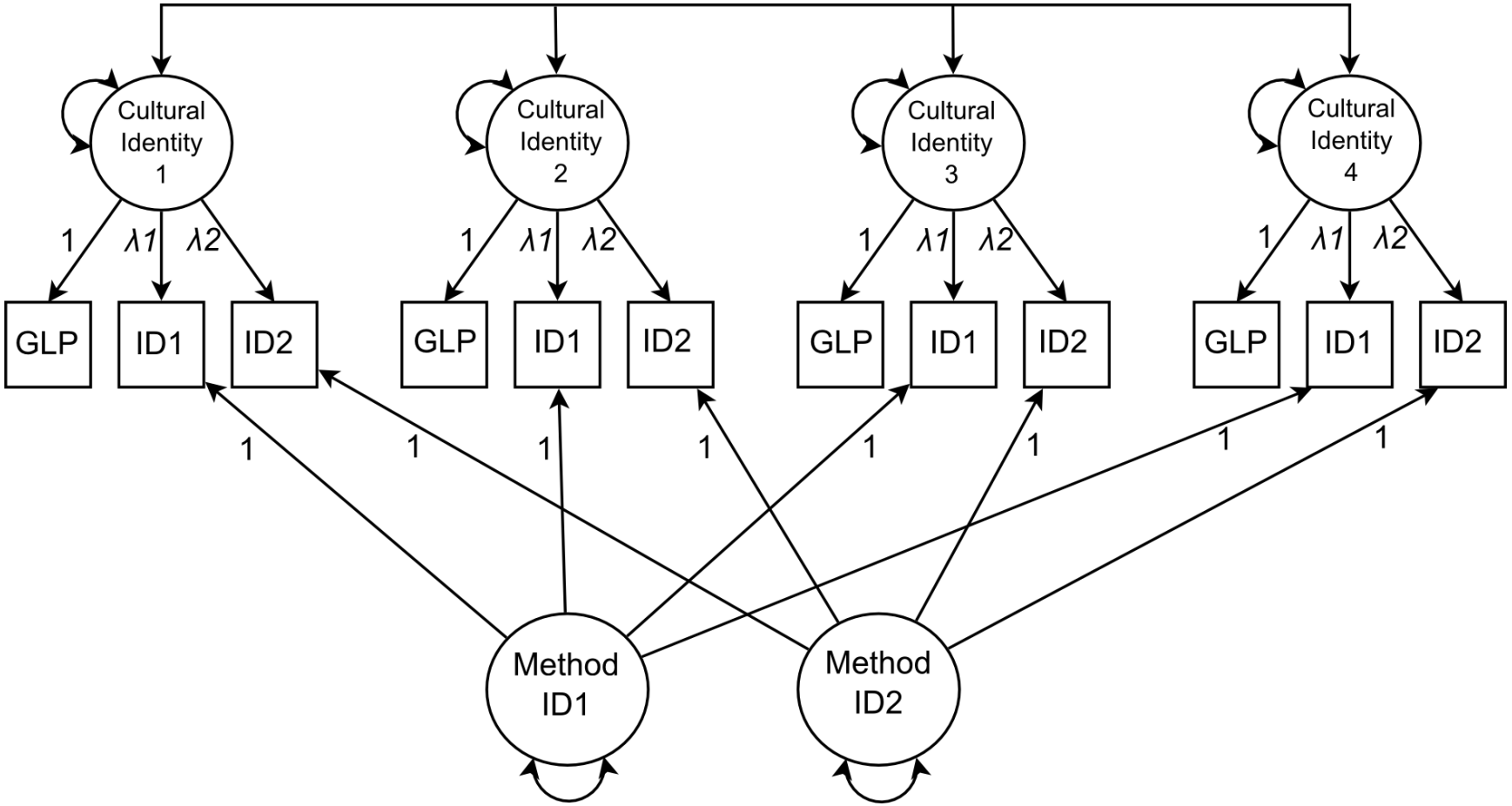
Note: Year on the x-axis refers to number of years since immigration.

the method factor for language proficiency variable.[2] The second issue was that the method factors for each of the two sets of foreign and German identity variables were highly correlated (*r* close to 1.0), leading to further issues with convergence. This could be addressed by modeling only two method factors (one with loadings from the first set of German and foreign identity variables, the other with loadings from the second set of German and foreign identity variables), rather than four method factors (one for each of the two German and two foreign identity variables). In this case, loadings of German identity variables were set to 1.0 and loadings of foreign identity variables were set to -1.0. Although these models converged, combining method factors leads to a more complicated conceptual interpretation. In order to simplify this model, I averaged German and foreign (reverse coded) identity ratings at each wave. Thus, the final measurement model had three indicators of latent identity variable: cultural identity variable that was the average of German and foreign (reverse coded) identity items from the first part of the study, cultural identity variable that was the average of German and foreign (reverse coded) identity items from the second part of the study, and German language proficiency. Longitudinally, the model included two method factors, one for each of the cultural identity variables, which were constrained to be unrelated to each other or any other variables in the model. This model is shown in Figure 3.

Comparing groups. In addition to fitting all models to the overall sample, I made group comparisons for four types of groups. First, I compared Sample B to all other samples. Sample B was made up of members of the five most commonly represented foreigner groups that generally

[2] I chose language proficiency variable to serve as the reference item because it was the variable that was constant throughout the study and was thus available at every wave. However, I also considered alternative models that used other variables as reference items (e.g., a model that allows for a method factor for language proficiency but not for one of the identity variables). These alternative models led to virtually identical conclusions.

Figure 3
Model of identity over four occasions



Notes: GLP = German language proficiency, *ID1* = average of foreign and German identity items from first part of the study, *ID2*= average of foreign and German identity items from second part of the study.

came to Germany as guest workers. It was also the subsample that included largest number of immigrants. There were two unique features of this sample compared to other samples that led me to select this sample for group comparisons. First, members of this sample generally initially came to Germany with a specific purpose (as temporary workers), although a large number stayed in Germany permanently, and these differences in initial motivation may result in differences in development of identity. Second, a large proportion of immigrants in later samples immigrated after reunification of Germany that occurred in 1990. This may have an effect on development of identity and life satisfaction of immigrants over time because immigrants' motivations for immigration and their long-term plans for stay in Germany possibly changed after this point. Because of these reasons, I compared trajectories and relative contribution of different sources of influence on life satisfaction and identity of immigrants from Sample B and all other samples.

The second group comparison was done within Sample B and it was between people of Turkish background and people of other backgrounds. People of Turkish descent tend to be more identifiable as foreigners (i.e., their characteristics such as skin colour are more visibly foreign) and thus the processes that affect identity and life satisfaction and the relationship between the two (i.e., discrimination) may differ for this group. I constrained this comparison to people in Sample B in order to keep constant other possible variables that may affect immigration and differ between samples.

Third, I compared women and men. It has been suggested that women and men may experience different challenges to acculturation that may affect their adaptation to life in a new culture (Phinney et al., 2001), yet this claim has generally not been tested. Fourth, I compared trajectories and sources of individual differences for people who immigrated at different ages.

For this goal I created two groups: those who immigrated prior to age of 25 and those who immigrated after age of 25. I chose this age because age of 25 generally marks beginning of adulthood as people at this point have generally completed their education and began to establish careers and families, meaning that their lives become increasingly stable.[3]

Modeling trajectories of identity and life satisfaction: Growth models. To see how life satisfaction and identity of immigrants changed over time I fit a series of growth models to the overall sample. For life satisfaction, the growth model was fit to observed items that assessed life satisfaction. For identity, the model was fit to the latent identity variables.

The first model included only the intercept, defined as the average score over the course of the study. Intercept was modeled as a latent variable with loadings of 1.0 from life satisfaction (or identity) at each wave. Mean and variance of the intercept were estimated freely, allowing for individual differences in average level of life satisfaction (or identity). Residual variances were constrained to be equal and unrelated over time, and residual means were set to 0.

The second model added a linear growth factor to model linear change in life satisfaction (or identity) over time. I specified the loadings so that the intercept represented the initial score on life satisfaction (or identity) in the year of immigration (i.e., year 0), and the linear slope estimate represented change in life satisfaction (or identity) over a 10-year period.[4] Means and variances of the intercept and linear slope and the covariance between the two were estimated

[3] Age could also be treated as a continuous variable. However, in order to keep the analyses consistent throughout the study, I categorized age at immigration. Although analyses with continuous age variable may show interesting patters in the effect of age, the basic question I wanted to address was whether identity and well-being outcomes of people who immigrated in adulthood differ from those who immigrated in childhood through emerging adulthood when most of the development occurs (and around who most previous research was concentrated). Categorical treatment is appropriate for this goal.

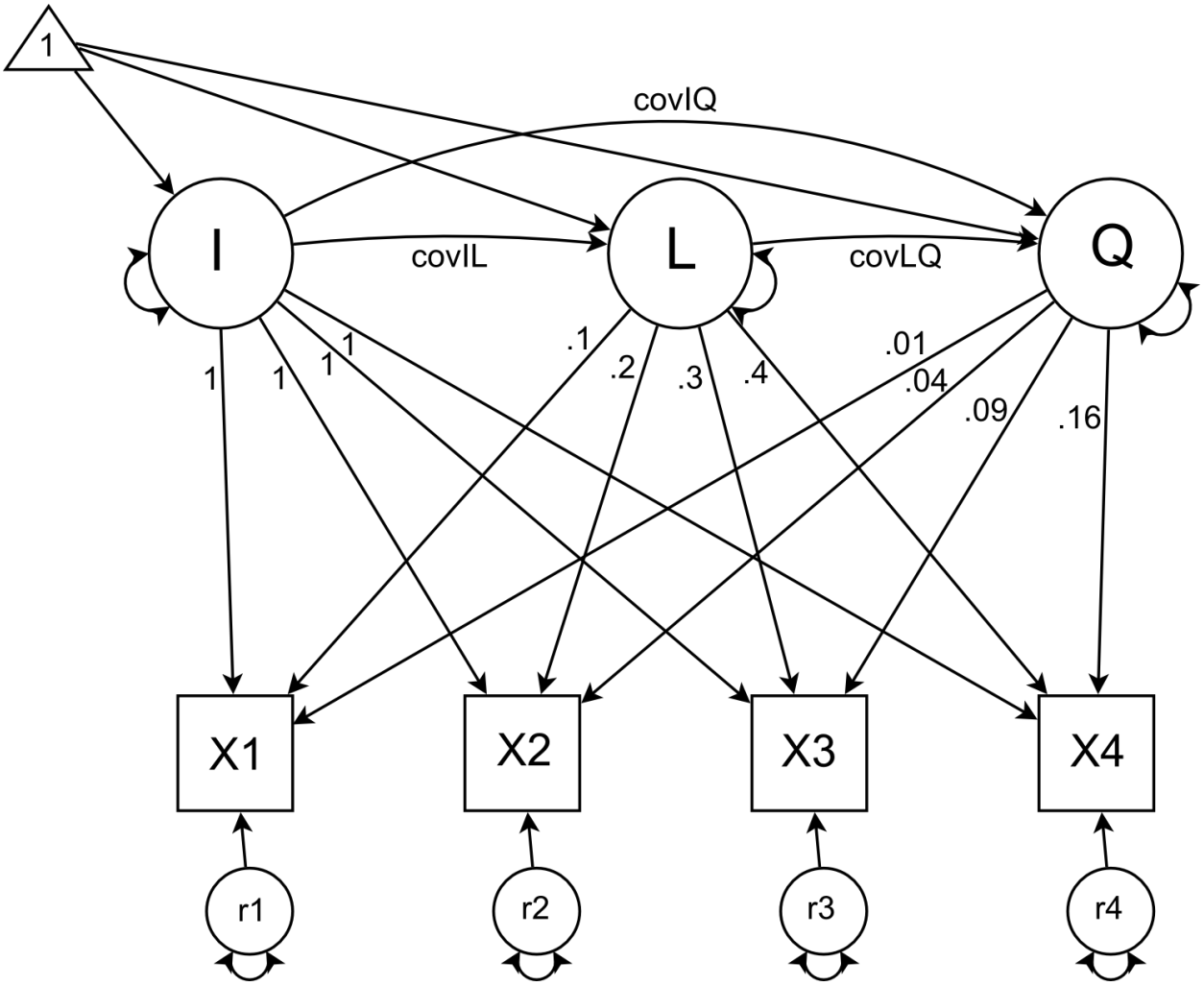
[4] In particular, the loadings of life satisfaction (or identity) from years 1 through 30 on the slope factor were .1, .2, .3, …, 2.8, 2.9, 3.0.

freely. This allowed for individual differences in initial score and change over time, and it allowed for the possibility that change over time was related to the initial standing on the variable. As in the intercept-only model, the residual variances of life satisfaction (or identity) were constrained to be equal and unrelated over time, and the means of residuals were constrained to 0.

In the third model I added a quadratic growth factor. This factor allows for different rates of change at different time points. For example, Figure 2 suggests that identity changes more in the first years following immigration than in the later years. In addition to the intercept and slope factors, this model included a latent variable representing quadratic growth with loadings from each occasion equal to the squared loadings on the linear growth factor. This changes the interpretation of the linear slope, which now becomes the initial rate of change (i.e., in year 0). The quadratic slope is interpreted as the change in rate of change over a 10-year period. Means and variances of the intercept and the linear and quadratic slopes were freely estimated. This allowed for individual differences in starting values and change over time. The quadratic model can be seen in Figure 4.

Testing group differences in trajectories. I tested whether life satisfaction and identity trajectories were different for different groups by doing a series of nested multiple group analyses. As all group comparisons involved two groups (Sample B vs. other samples; Turkish immigrants vs. other immigrants from Sample B; women vs. men; those who immigrated prior to vs. after the age of 25), a significant chi-squared difference test between two models with different constraints would indicate that the groups differed in the parameters freed in the less constrained model. I specified the nested models in the following way.

Figure 4
Quadratic growth model fit to a single variable over years the first four years following immigration



Notes: Time = 0 is implied in the model to represent year of immigration. Linear model omitted the quadratic slope factor, and the intercept-only model omitted both linear and quadratic slope factors. X_t = observed variable, *I* = intercept, *L* = linear slope, *Q* = quadratic slope, r_t = residual variance, *cov*IL = intercept-linear slope covariance, *covIQ* = intercept-quadratic slope covariance, *covLQ* = linear slope-quadratic slope covariance.

In the first model, all parameters were constrained to be equal: residual variances, intercept and slope variances and means and intercept-slope covariances. Residual variances were allowed to differ in the second model. The third model also included relaxed intercept and

slope variances. In the fourth model I allowed intercept means to differ, and in the fifth model slope means were free to differ as well. Chi-squared tests were used to select the best fitting model.

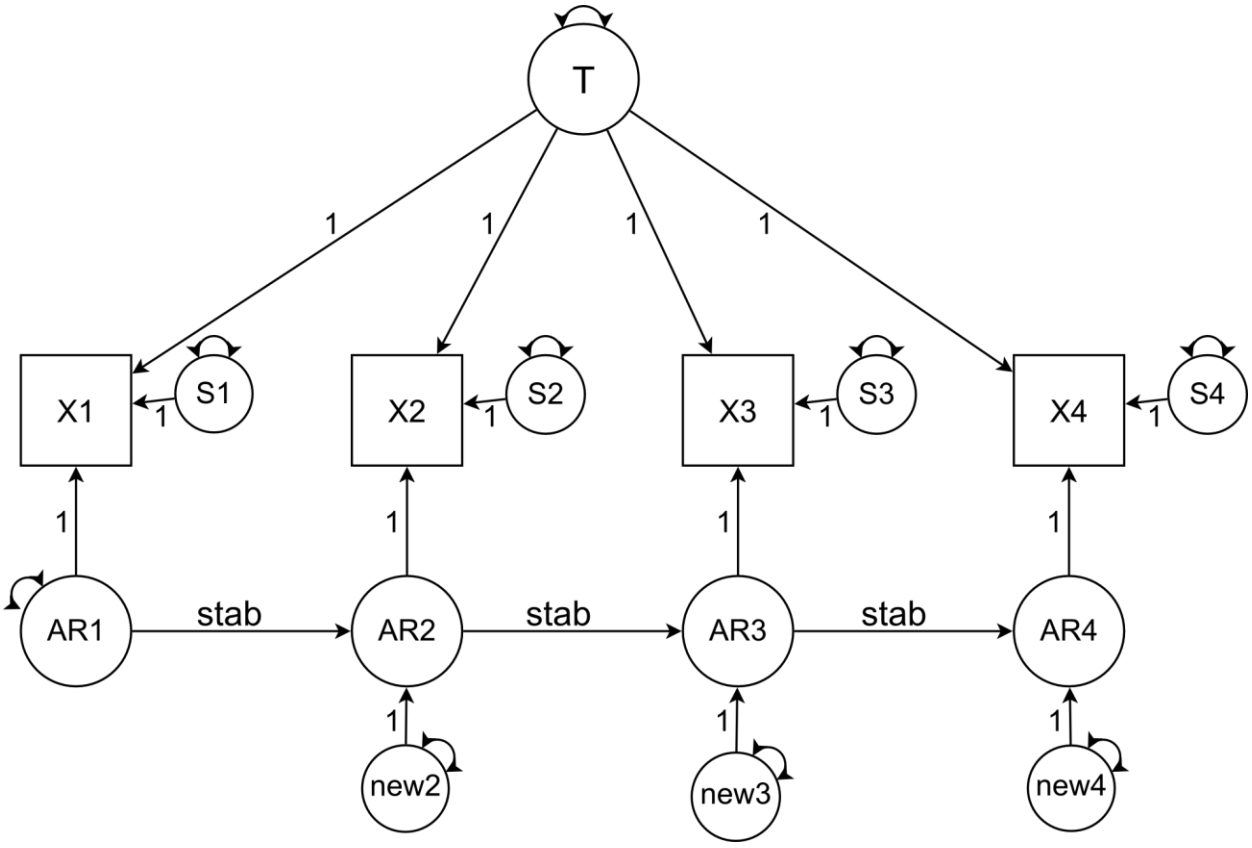
Modeling sources of individual differences over time: The STARTS model. Single-variable STARTS model is shown in Figure 5 (Kenny & Zautra, 1995; Kenny & Zautra, 2001). According to this model, a person's standing at any measurement occasion is determined by three latent variables: stable trait (T), autoregressive trait (AR), and state (S). The stable trait variable includes all stable determinants of the measured construct (life satisfaction or cultural identity). For example, stable determinants may include one's genetic blueprint or stable environmental factors that do not change over the course of the study. The AR variable reflects all influences on the construct whose effects last over one year (but less than the duration of the study). For example, one's standing on life satisfaction may be temporarily altered by an experience of unemployment, but after some time the rank-ordering will be restored (e.g., Yap et al., 2012). These changes accumulate over the years, resulting in slow changes in overall rank-ordering over time. The stability of the AR component reflects the typical duration of the effects that these types of determinants have on the construct. For example, a high stability would suggest that influences captured in the AR component are relatively long-lasting (but their effects are still shorter than the time-span of the study), whereas low stability estimates would suggest that these influences in general tend to exert their effects over shorter periods of time (e.g., a couple of years). The final variable in this model, S, reflects occasion-specific determinants of person's standing on the construct. These influences include random measurement error, transient influences that may be unrelated to the construct itself (e.g., mood), and any other factors that influence these constructs but whose effects do not extend to the next

measurement occasion. It is important to note that the STARTS model can only tell us about the relative extent of influence of these different determinants on the measured construct, but it does not say anything about what these determinants are. Indeed, actual determinants may vary across individuals. For example, income is related to life satisfaction (e.g., Howell & Howell, 2008). However, for a person whose income remains completely stable over the course of the study, income may be a stable determinant of well-being. In contrast, for a person whose income changes at some point during the study the effects of income would be captured by the AR or S component, depending on whether these changes in income have longer- or shorter-term effects on well-being.

The STARTS model assumes stationarity of variance (i.e., that total variance at each wave is equal), which allows for a number of constraints that are traditionally imposed on the model. First, the amount of variance contributed by each component (T, AR, S) is constrained to be equal at each wave. The amount of new AR variance (i.e., not predicted by previous measurement occasion) is also constrained to be equal across waves, as is the stability of the AR component.

The model is specified the following way. Loading of the observed variable at each wave on the latent T variable is constrained to 1. AR variables are modeled at each wave by constraining the loading of the measured variables to 1. Each AR variable (except for the first AR variable) is regressed onto the previous AR variable, and these regression paths are constrained to be equal. The residual AR variance is also constrained to be equal over time. Total AR variance at each wave is constrained to be equal by the nonlinear constraint: var(*new*) = var(AR_1)– var(AR_1)*$stab^2$. The residual observed variance at each wave is loaded onto S variables with a loading of 1, and these are constrained to be equal across waves.

Figure 5
Single variable STARTS model over 4 measurement occasions



Notes: X_t = observed variable, new T = stable trait variance, AR_t = autoregressive variance, S_t = state (occasion-specific) variance, *stab* = stability of the autoregressive component, new_t = new autoregressive variance.

Testing for changing influences over time. In its basic form, the STARTS model assumes that the total amount of variance, relative influence of different factors (i.e., T, S, AR), and stability of the AR component are equal over time and that the relative influence of different factors (i.e., T, AR, S) is equal over time. These assumptions are often necessary for model identification, however with enough data they can be tested. It is reasonable, for example, to assume that stability of various psychological constructs increases over time because people's lives become increasingly stable (Anusic & Schimmack, 2012).

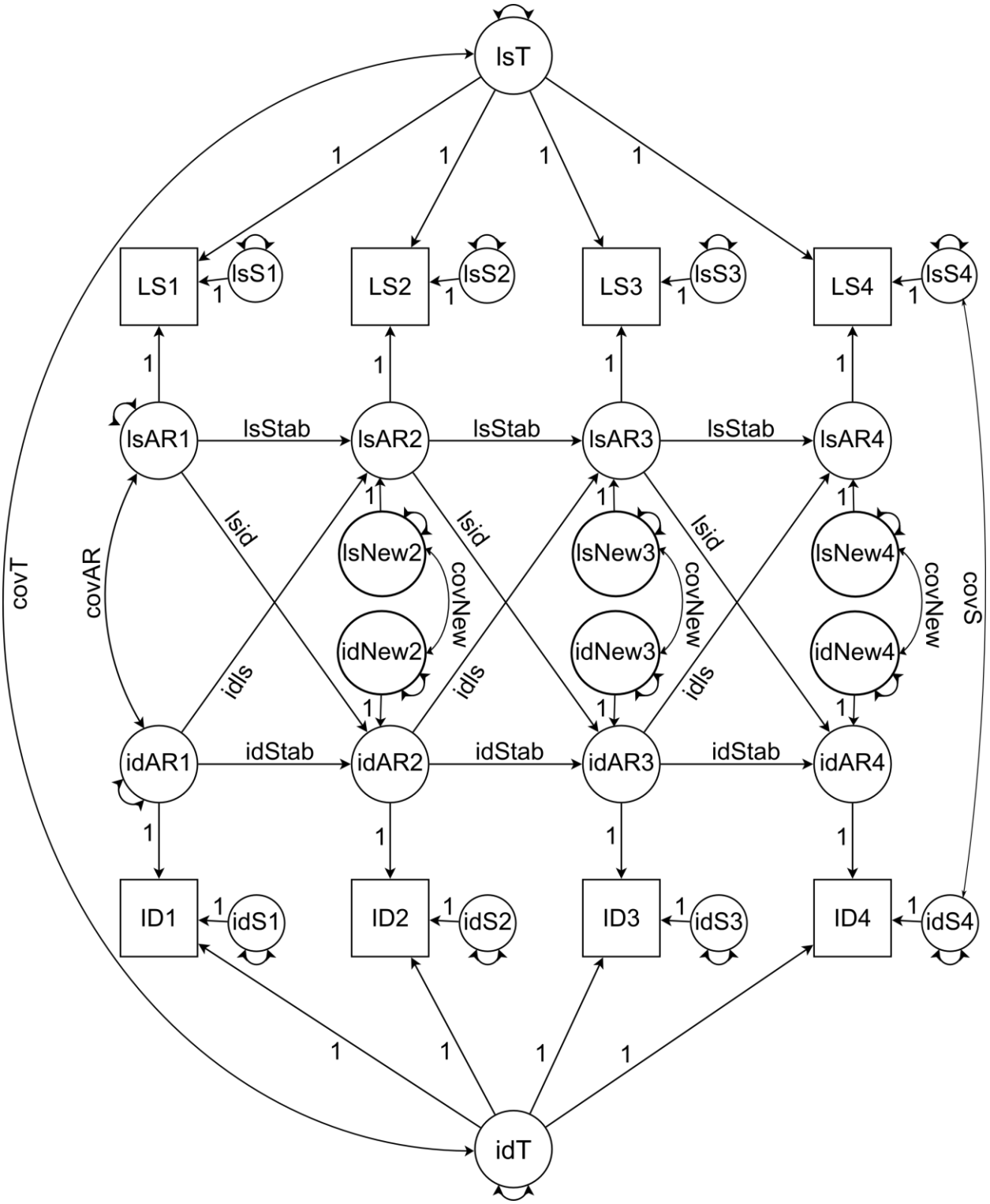
In addition to the fully constrained model described above, I will test models that allow for varying extent of the occasion-specific (S) influences and for varying stabilities of the autoregressive component. For this purpose, I will divide the timeframe following immigration into three periods: years 1 through 10, 11 through 20, and 21 through 30, and I will test three models. The first model will be the constrained STARTS model described above. The second model will allow for different S variances across the three time periods. In addition, the third model will allow for differing AR stabilities (and by extension different amounts of new AR variance) during each time period. These models will be fit to both identity and life satisfaction data. I will use chi-squared test to select the best fitting model.

Testing group differences in sources of individual differences. Just as different groups of immigrants may follow different trajectories of identity or life satisfaction over the years following immigration, so can they vary in the extent to which they may be influenced by stable and changing factors. To test this idea I will use a series of multiple group analyses.

In Model 1, all parameters will be constrained to be equal across groups (amount of T, S, and initial AR variance, and the stability of the AR component). Model 2 will allow for group differences in the amount of stable influences (T variance). In Model 3, occasion-specific (S) variance will also be free to vary across groups. Finally, Model 4 will allow for group differences in the amount and stability of the AR variance. Chi square tests will used to identify best fitting model for each group.

Bivariate STARTS model. The STARTS model can be extended to two variables in order to test hypothesis about causal relationships (Cole et al., 2006; Lucas & Donnellan, 2012; Luhmann et al., 2011; Schimmack & Lucas, 2010). The bivariate STARTS model is shown in Figure 6. The standard model is fit to each of the two variables, and several coupling associations

Figure 6
Bivariate STARTS model over 4 measurement occasions



Notes: LS_t = observed life satisfaction variable. ID_t = observed identity variable, T = stable trait variance, AR_t = autoregressive variance, S_t = state (occasion-specific) variance, *stab* = stability of

Figure 6 (cont'd)
the autoregressive component, new_t = new autoregressive variance. *covT* = covariance between trait components, *covAR* = covariance between first autoregressive variances, *covNew* = covariance between new autoregressive components, *covS* = covariance between state components, *lsid* = effect of life satisfaction on future identity, *idls* = effect of identity on future life satisfaction. *covS* is present at all measurement occasions, but is omitted from the figure for simplicity.

are added. Covariances are allowed between the latent trait variables of each construct (*covT*), between the initial AR variables (*covAR*), and between new variances that contribute to the AR component at each wave – and these are constrained to be equal across waves (*covNew*). In addition, two cross-lagged paths are added for each occasion: one predicting cultural identity from previous life satisfaction (*lsid*) and one predicting life satisfaction from previous cultural identity (*idls*). Each of these effects is constrained to be equal across measurement occasions. Three nonlinear constraints are required (Kenny & Zautra, 1999). For each variable, the total AR variance at each wave is constrained to be equal with constraints var(*lsNew*) = var($lsAR_1$) – var($lsAR_1$)**lsStab*^{2} – var($idAR_1$)**idls*^{2} – *lsStab***covAR***idls* and var(*idNew*) = var($idAR_1$) – var($idAR_1$)**idStab*^{2} – var($isLS_1$)**lsid*^{2} – *idStab***covAR***lsid*. In addition, the covariance between the initial AR variables is constrained by: *covAR* = (*lsStab***idls**var(*lsNew*) + *idStab***lsid**var(*idNew*) + *covNew*)/(1 - *lsStab***idStab* – *idls***lsid*).

Testing group differences in relationship between identity and life satisfaction.

Multiple group analyses can be used to test for group differences in the relationship between identity and life satisfaction. How these are specified will depend on the best fitting models for particular groups that result from the multiple group analyses for single-variable STARTS model. If there are no group differences in stable trait or state variances, I will be able to test whether there are group differences in the association between life satisfaction and identity at

these levels (*covT* and *covS*) by comparing models that constrain these covariances to be equal or to those that allow them to differ across groups. For example, stable influences may be responsible for the association between the two variables for some groups but not others. On the other hand, constraining these covariances to be equal is not reasonable if the T and S variances vary across groups. If the amount and stability of the AR variance is equal across groups I will be able to test whether the covariances between the initial and new components (*covAR* and *covNew*) of identity and life satisfaction vary across groups. Importantly, in this case I will be able to test whether life satisfaction has different effects on future identity (*lsid*) for different groups, and whether identity has different effects on future life satisfaction (*idls*) for different groups.

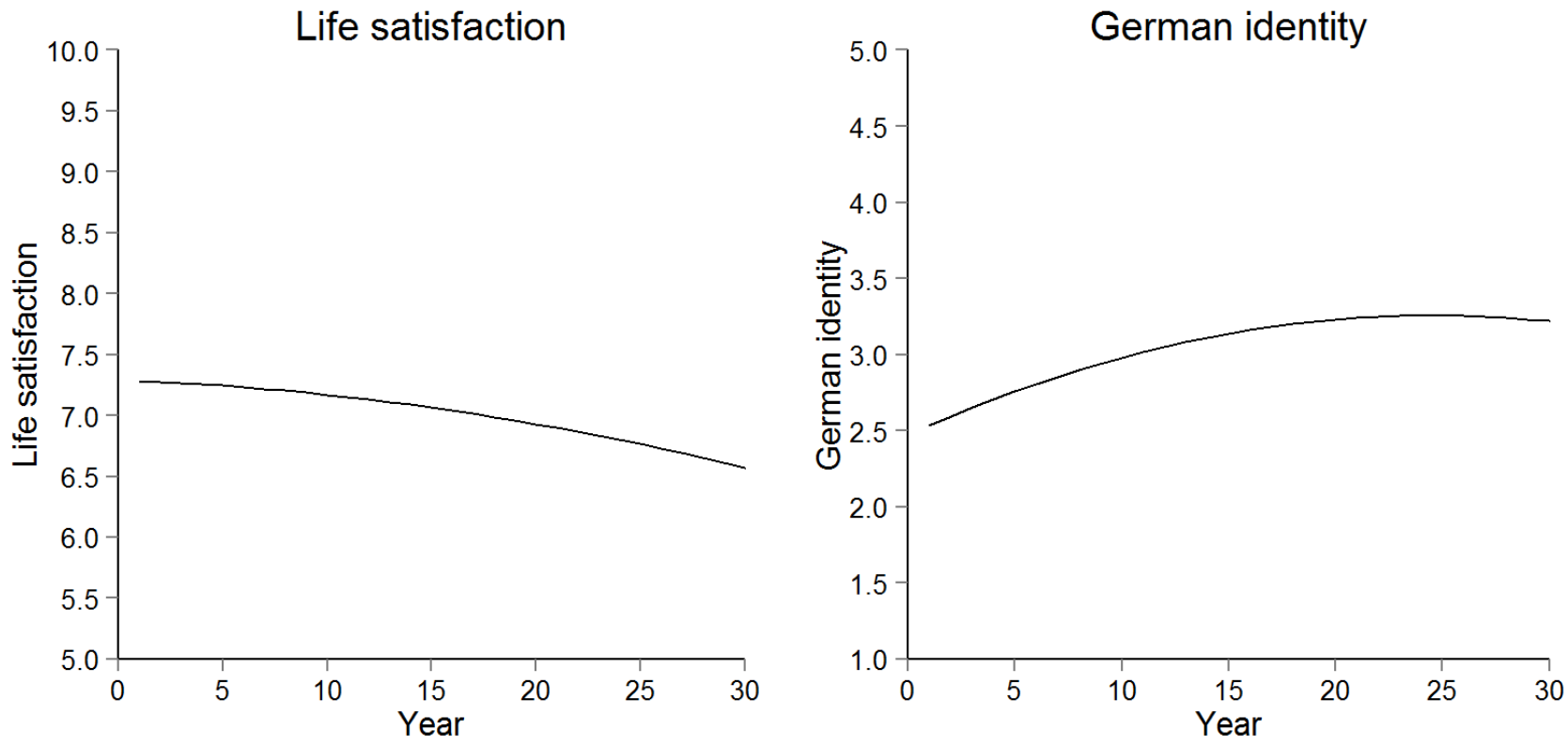
RESULTS

Trajectories of Identity and Life Satisfaction

Results of the growth models for identity and life satisfaction are shown in Tables 4 and 5. The first column in each of the tables shows the intercept-only model that included no change over time. The model in the second column included only linear change, and the model in the third column included both linear and quadratic change over time. The chi squared difference test indicated that for both variables the linear model fit better than the intercept model ($\Delta\chi^2$ = 1,533.71, df = 3, p < .05 for life satisfaction, $\Delta\chi^2$ = 961.99, df = 3, p < .05 for identity), and that the quadratic model fit better than the linear model ($\Delta\chi^2$ = 304.06, df = 4, p < .05 for life satisfaction, $\Delta\chi^2$ = 308.14, df = 4, p < .05 for identity). The trajectories predicted by the quadratic model are shown in Figure 7.

Life satisfaction showed a relatively steady decrease over time, with somewhat faster rate of decline in later years than in earlier years. However, the overall decline is consistent with the GSOEP-specific panel conditioning effect found in past research that was related to length of time in the study but unrelated to age or cohort (Baird et al., 2010). The panel conditioning effect showed that participants' scores decreased by 0.03 points per year – which is consistent with the average yearly decline estimated by the quadratic model (decline of $0.06*3 + 0.06*3^2 = 0.72$ points over 30 years, or average decline of 0.024 points per year). Thus, this decline may simply reflect the panel conditioning effect. On the other hand it is still unknown whether this effect can be generalized to more specific population such as immigrants or to other variables such as cultural identity, and the decline may reflect true declines in immigrants' well-being as they become adjusted to life in the new society. For this reason I did not use adjusted scores (that take

Figure 7
Model estimated trajectories for life satisfaction (right) and identity (left) for the whole sample



into account panel-conditioning decline) in my analyses as is sometimes done in research that uses life satisfaction data from the GSOEP (e.g., Anusic & Lucas, in press).

In contrast, immigrants reported strengthening German identity over time. Greatest increases in identity scores occurred in the first decade following immigration. Virtually no further change in cultural identity occurred after 15 years of living in Germany.

Group differences in trajectories. Preliminary analyses suggested that several modifications to the original model were needed to estimate multiple group models. First, the fit of the multiple group models for life satisfaction was often inadequate (TLI < .90). The fit could be improved by addition of covariance between consecutive years (i.e., year 1 and year 2, year 2 and year 3, etc.), and these covariances were constrained to be equal. The results of this model are shown in the fourth column of Table 4. This change resulted in reduced variance estimates of intercept and linear slope, but it did not substantially affect estimates of means.

Second, it was not possible to run multiple group analyses using the full identity model because some groups had only scarce (if any) data for some variables. For example, participants in later samples did not have data on the identity variables from the first part of the study. In addition, for groups that did have full data the models were too demanding given available computer resources.[5] Because of this, I ran multiple group comparisons using only German language proficiency that was available throughout the study. Prior to this I fit the model that included only the language proficiency variable to all available data. These estimates can be seen in the fourth column of Table 5. As the results show, the estimates were quite similar for the two models, suggesting that language proficiency is an adequate approximation of cultural identity.

[5] Multiple group analyses with the full identity model resulted in Mplus message: "Fatal error: There is not enough memory space to run Mplus on the current input file."

Table 4
Results of growth models fit to life satisfaction data.

	Intercept only	Linear slope	Quadratic slope	With correlated residuals	With fixed quadratic slope
Model Fit					
χ^2	3611.74	2067.03	1762.97	1278.83	1431.25
df	482	479	475	474	477
TLI	.81	.90	.92	.95	.94
RMSEA	.04	.03	.02	.02	.02
$\Delta\chi^2$	-	1544.71*	304.06*	-	-
Δdf	-	3	4	-	-
Means					
Intercept	6.99* (0.02)	7.52* (0.04)	7.29* (0.07)	7.28* (0.07)	7.38* (0.07)
Linear slope		-0.31* (0.02)	-0.06 (0.08)	-0.05 (0.08)	-0.15* (0.07)
Quadratic slope			-0.06* (0.02)	-0.06* (0.02)	-0.04* (0.02)
Variances					
Intercept	1.56* (0.04)	4.04* (0.17)	4.79* (0.37)	3.50* (0.32)	3.30* (0.16)
Linear slope		0.77* (0.04)	5.97* (0.56)	3.80* (0.52)	0.58* (0.04)
Quadratic slope			0.41* (0.04)	0.24* (0.04)	-
Residuals	2.35* (0.02)	2.13* (0.02)	2.08* (0.20)	2.19* (0.02)	2.23* (0.02)
Covariances					
Intercept-Linear slope		-1.40* (0.08)	-4.00* (0.44)	-2.44* (0.39)	-1.05* (0.08)
Intercept-Quadratic slope			0.73* (0.12)	0.35* (0.11)	-
Linear slope-Quadratic slope			-1.46* (0.15)	-0.87* (0.14)	-
Residual correlations				0.29* (0.01)	0.33* (0.01)
Correlations					
Intercept-Linear slope		-0.79* (0.01)	-0.75* (0.02)	-0.67* (0.04)	-0.76* (0.02)
Intercept-Quadratic slope			0.52* (0.04)	0.38* (0.08)	-
Linear slope-Quadratic slope			-0.93* (0.01)	-0.91* (0.02)	-
Residual correlations				0.13* (0.01)	0.15* (0.01)

*Note: * $p < .05$*

Table 5
Results of growth models fit to identity data

	Intercept only	Linear slope	Quadratic slope	Language proficiency	With fixed quadratic slope
Model Fit					
χ^2	6115.56	5153.57	4845.43	884.44	976.53
df	2205	2202	2198	449	452
TLI	0.88	0.91	0.92	0.98	0.98
RMSEA	0.02	0.02	0.02	0.02	0.02
$\Delta\chi^2$	-	961.99*	308.14*	-	-
Δdf	-	3	4	-	-
Factor loadings					
Language proficiency	1.00	1.00	1.00		
Identity 1	0.62* (0.00)	0.62* (0.00)	0.62* (0.00)		
Identity 2	0.71* (0.01)	0.71* (0.01)	0.71* (0.01)		
Means					
Intercept	3.06* (0.02)	2.81* (0.02)	2.47* (0.04)	2.50* (0.04)	2.46* (0.04)
Linear slope		0.17* (0.01)	0.64* (0.04)	0.61* (0.04)	0.65* (0.04)
Quadratic slope			-0.13* (0.01)	-0.13* (0.01)	-0.14* (0.01)
Variances					
Intercept	0.97* (0.02)	1.34* (0.05)	1.41* (0.09)	1.54* (0.10)	1.34* (0.05)
Linear slope		0.13* (0.01)	0.86* (0.11)	0.91* (0.12)	0.11* (0.01)
Quadratic slope			0.05* (0.01)	0.06* (0.01)	-
Method: Identity 1	0.35* (0.01)	0.35* (0.01)	0.35* (0.01)		
Method: Identity 2	0.44* (0.02)	0.43* (0.02)	0.43* (0.02)		
Residuals: Identity factor	0.07* (0.01)	0.04* (0.01)	0.04* (0.01)		
Residuals: Language proficiency	0.22* (0.01)	0.22* (0.01)	0.21* (0.01)	0.25* (0.00)	0.25* (0.00)
Residuals: Identity 1	0.43* (0.01)	0.43* (0.01)	0.43* (0.01)		
Residuals: Identity 2	0.31* (0.01)	0.32* (0.01)	0.32* (0.01)		
Covariances					
Intercept-Linear slope		-0.56* (0.02)	-0.53* (0.04)	-0.56* (0.04)	-0.54* (0.03)
Intercept-Quadratic slope			0.38* (0.06)	0.43* (0.05)	-
Linear slope-Quadratic slope			-0.94* (0.01)	-0.95* (0.01)	-

Table 5 (cont'd)

	Intercept only	Linear slope	Quadratic slope	Language proficiency	With fixed quadratic slope
Correlations					
Intercept-Linear slope		-0.24* (0.02)	-0.59* (0.09)	-0.66* (0.10)	-0.21* (0.02)
Intercept-Quadratic slope			0.10* (0.02)	0.13* (0.03)	-
Linear slope-Quadratic slope			-0.20* (0.03)	-0.21* (0.03)	-

*Notes: * $p < .05$*. Identity 1 is the composite of items assessing German and foreign identity directly in the first part of the study. Identity 2 is the composite of items measuring German and foreign identity in the second part of the study.

Third, the high correlation between linear and quadratic slopes ($r > .9$) led to convergence difficulties for some of the models. Because of this, I constrained the quadratic slope variance to 0. This change reduced model fit but allowed all models to converge. As can be seen in the last column of Tables 4 and 5, estimates of means were unaffected by this constraint, although variances of intercept and slope factors and their correlations were reduced.

Summaries of multiple group models are shown in Table 6. The $\Delta\chi^2$ column provides a test of fit increase for models that allow parameters to vary across groups over those that constrain them to be equal. For each type of group comparison I selected the best fitting model based on $\Delta\chi^2$ tests. The results of these final models are shown in Tables 7 and 8. Figures 8 to 11 also show raw means and model predicted trajectories of life satisfaction (left panel) and identity (right panel) for each group.

Sample differences. The model that best captured differences between Sample B and other samples for life satisfaction specified different residual variances and different intercept and slope means and variances for each group. As the results in Table 7 and the left panel of Figure 8 show, participants in Sample B rated their life satisfaction higher initially, but then showed a greater decline over time compared to participants from other samples.

For language proficiency, the groups varied in the amount of variance, and initial ratings (intercepts), but not the extent of change over time (slopes). Participants in Sample B reported lower German language proficiency at the time of immigration than participants in the other samples, and although both groups became more proficient over time, the differences between them remained constant.

Differences related to country of origin. Within Sample B, I compared life satisfaction and language proficiency trajectories of people immigrating from Turkey to those immigrating

Table 6

Comparisons of multiple group analyses with different constraints on the quadratic growth models

	Life satisfaction						Identity					
	χ^2	df	TLI	RMSEA	$\Delta\chi^2$	Δdf	χ^2	df	TLI	RMSEA	$\Delta\chi^2$	Δdf
Sample B vs. other samples												
Equal	2683.26	961	.90	.03			1637.76	644	.96	.03		
+ different residual variances	2581.07	959	.90	.03	102.19*	2	1625.50	643	.96	.03	12.25*	1
+ different intercept and slope variances	2567.61	956	.90	.03	13.46*	3	1588.50	640	.96	.03	37.01*	3
+ different intercepts	2546.52	955	.91	.03	21.09*	1	1252.11	639	.98	.02	336.39*	1
+ different slopes	2525.21	953	.91	.03	21.32*	2	1251.96	637	.98	.02	0.15	2
Turkish vs. other immigrants												
Equal	2478.30	958	.87	.03			1660.51	905	.96	.02		
+ different residual variances	2403.00	956	.87	.03	75.30*	2	1635.68	904	.96	.02	24.83*	1
+ different intercept and slope variances	2400.32	953	.87	.03	2.67	3	1627.03	901	.96	.02	8.65*	3
+ different intercepts	2295.97	952	.88	.03	104.35*	1	1621.02	900	.96	.02	6.00*	1
+ different slopes	2295.63	950	.88	.03	0.35	2	1604.79	898	.97	.02	16.23*	2
Women vs. men												
Equal	2370.80	961	.92	.02			1709.21	909	.97	.02		
+ different residual variances	2370.32	959	.92	.02	0.48	2	1707.79	908	.97	.02	1.42	1
+ different intercept and slope variances	2353.68	956	.92	.02	16.64*	3	1667.25	905	.97	.02	40.53*	3
+ different intercepts	2351.38	955	.92	.02	2.30	1	1633.19	904	.97	.02	34.06*	1
+ different slopes	2350.46	953	.92	.02	0.91	2	1608.49	902	.97	.02	24.70*	2
Age at immigration <= 25 vs. > 25												
Equal	2598.40	961	.90	.03			2460.86	907	.93	.03		
+ different residual variances	2523.95	959	.91	.03	74.45*	2	2422.24	906	.93	.03	38.61*	1
+ different intercept and slope variances	2490.04	956	.91	.03	33.91*	3	2410.56	903	.93	.03	11.68*	3
+ different intercepts	2431.32	955	.91	.03	58.73*	1	1742.30	902	.96	.02	668.26*	1
+ different slopes	2427.87	953	.91	.03	3.45	2	1695.32	900	.96	.02	46.98*	2

*Note: * $p < .05$*

Table 7

Results of the quadratic growth models from multiple group analyses of life satisfaction

	Sample		Country of origin		Gender		Age at immigration	
Model Fit								
χ^2	2525.21		2299.91		2354.22		2431.32	
df	953		955		958		955	
TLI	.91		.88		.92		.91	
RMSEA	.03		.03		.02		.03	
	Sample B	Other	Turkey	Other	Women	Men	Younger	Older
Means								
Intercept	7.51* (0.08)	7.21* (0.10)	7.25* (0.09)	7.77* (0.09)	7.38* (0.07)	7.38* (0.07)	7.50* (0.07)	7.16* (0.07)
Linear slope	-0.18* (0.09)	-0.33* (0.13)	-0.24* (0.09)	-0.24* (0.09)	-0.15* (0.07)	-0.15* (0.07)	-0.14 (0.07)	-0.14 (0.07)
Quadratic slope	-0.05* (0.02)	0.06 (0.04)	-0.04 (0.03)	-0.04 (0.03)	-0.04* (0.02)	-0.04* (0.02)	-0.05* (0.02)	-0.05* (0.02)
Variances								
Intercept	3.60* (0.21)	2.63* (0.24)	3.58* (0.22)	3.58* (0.22)	3.11* (0.21)	3.53* (0.24)	2.85* (0.18)	3.95* (0.31)
Linear slope	0.61* (0.05)	0.54* (0.08)	0.61* (0.05)	0.61* (0.05)	0.65* (0.06)	0.52* (0.05)	0.49* (0.04)	0.76* (0.08)
Residuals	2.31* (0.02)	1.94* (0.04)	2.56* (0.04)	2.20* (0.03)	2.23* (0.02)	2.23* (0.02)	2.14* (0.02)	2.41* (0.03)
Covariances								
Intercept-Linear slope	-1.15* (0.09)	-0.82* (0.13)	-1.16* (0.10)	-1.16* (0.10)	-1.08* (0.10)	-1.03* (0.11)	-0.88* (0.08)	-1.32* (0.15)
Residual correlations	0.33* (0.02)	0.31* (0.03)	0.35* (0.03)	0.30* (0.02)	0.32* (0.01)	0.32* (0.01)	0.30* (0.02)	0.36* (0.02)
Correlations								
Intercept-Linear slope	-0.78* (0.02)	-0.69* (0.04)	-0.78* (0.02)	-0.78* (0.02)	-0.76* (0.02)	-0.76* (0.02)	-0.75* (0.02)	-0.77* (0.02)
Residual correlations	0.14* (0.01)	0.16* (0.01)	0.14* (0.01)	0.14* (0.01)	0.15* (0.01)	0.15* (0.01)	0.14* (0.01)	0.15* (0.01)

*Note: * p < .05*

Table 8

Results of the quadratic growth models from multiple group analyses of identity

	Sample		Country of origin		Gender		Age at immigration	
Model Fit								
χ^2	1252.11		1604.79		1609.71		1695.32	
df	639		898		903		900	
TLI	.98		.97		.97		.96	
RMSEA	.02		.02		.02		.02	
	Sample B	Other	Turkey	Other	Women	Men	Younger	Older
Means								
Intercept	2.26* (0.04)	3.03* (0.04)	2.11* (0.05)	2.42* (0.06)	2.26* (0.05)	2.72* (0.05)	2.61* (0.04)	2.27* (0.06)
Linear slope	0.72* (0.04)	0.72* (0.04)	0.84* (0.05)	0.53* (0.06)	0.75* (0.05)	0.49* (0.06)	0.81* (0.05)	0.30* (0.06)
Quadratic slope	-0.16* (0.01)	-0.16* (0.01)	-0.20* (0.02)	-0.11* (0.02)	-0.16* (0.01)	-0.11* (0.02)	-0.18* (0.01)	-0.06* (0.02)
Variances								
Intercept	1.28* (0.05)	1.06* (0.13)	1.18* (0.07)	1.40* (0.08)	1.39* (0.07)	1.18* (0.07)	1.27* (0.06)	1.20* (0.08)
Linear slope	0.11* (0.01)	0.15* (0.05)	0.09* (0.01)	0.14* (0.02)	0.09* (0.01)	0.13* (0.01)	0.12* (0.01)	0.12* (0.02)
Residuals	0.26* (0.00)	0.21* (0.01)	0.28* (0.01)	0.24* (0.00)	0.25* (0.00)	0.25* (0.00)	0.26* (0.00)	0.23* (0.00)
Covariances								
Intercept-Linear slope	-0.21* (0.02)	-0.18* (0.08)	-0.16* (0.03)	-0.28* (0.03)	-0.17* (0.03)	-0.22* (0.03)	-0.24* (0.02)	-0.24* (0.03)
Correlations								
Intercept-Linear slope	-0.56* (0.03)	-0.45* (0.11)	-0.50* (0.05)	-0.63* (0.03)	-0.46* (0.04)	-0.56* (0.03)	-0.60* (0.03)	-0.65* (0.04)

*Note: * $p < .05$*

from other countries. The results indicated that for life satisfaction, residual variances and intercepts varied among groups. Turkish immigrants rated their life satisfaction lower throughout their life in Germany.

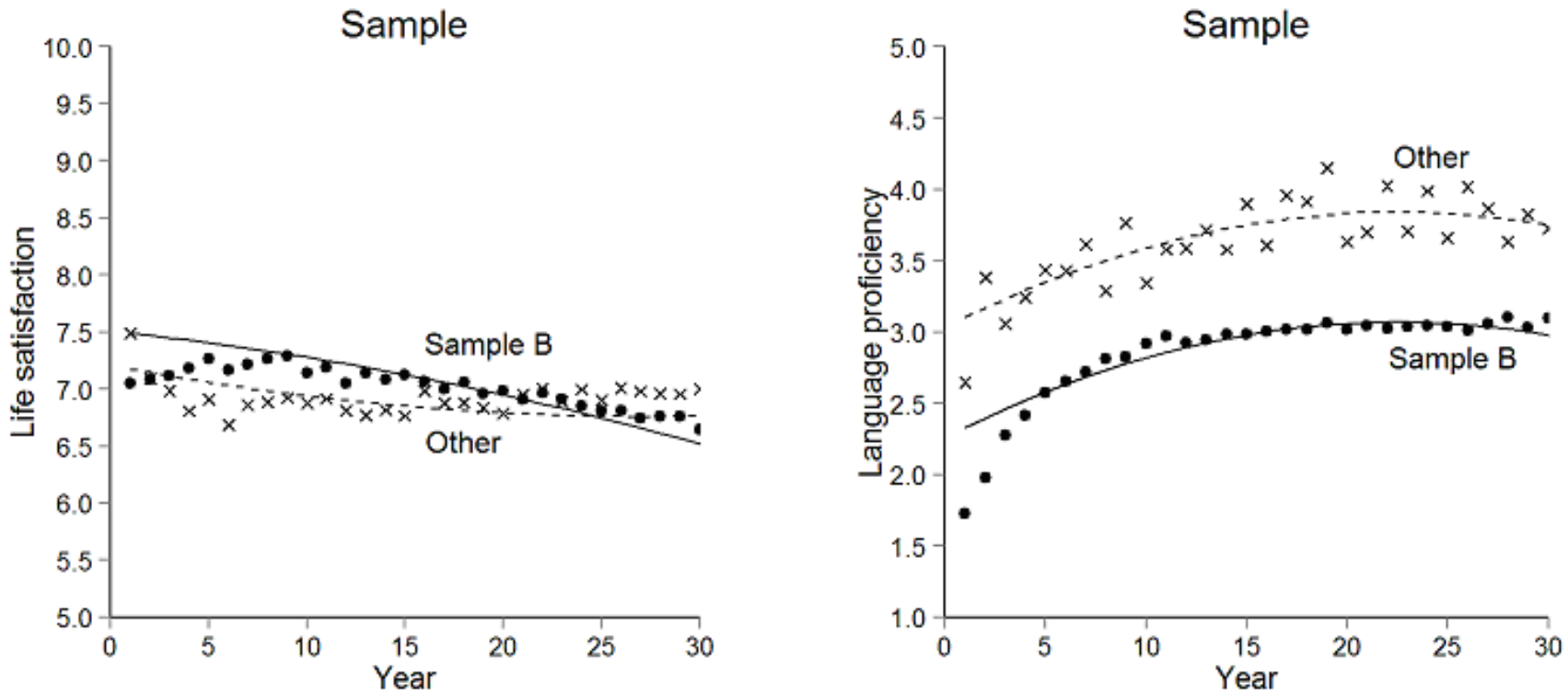
For language, all parameters differed across the two groups. As Figure 9 shows, Turkish immigrants reported lower initial German language proficiency. However, their proficiency increased at a faster rate over the first decade in Germany at which point the two groups were virtually identical in language proficiency.

Gender differences. There were no gender differences in overall trajectories for life satisfaction (see Figure 10). The only group differences were in the amount of variation in intercepts and slopes: there were more individual differences in initial levels of life satisfaction for men, but more variation in the extent of change for women. For identity, women and men differed in both initial levels and extent of change. Men reported greater German language proficiency at the start of the study, but women gained proficiency at a greater rate, resulting in similar levels over longer periods of time.

Differences related to age at immigration. To evaluate age differences I compared trajectories of participants who immigrated before age of 25 and those who immigrated after age of 25. In addition to differences in variances in life satisfaction, such that older immigrants showed more variability both in initial levels and extent of change, younger immigrants reported higher initial levels of life satisfaction and this difference remained constant over the next three decades. For language proficiency, all parameters differed between the two groups. According to the model, younger participants reported higher language proficiency at the time of immigration (although, the raw data in Figure 11 suggests that both groups may have initially had the same level of proficiency), and reported greater increases in proficiency over time.

Figure 8

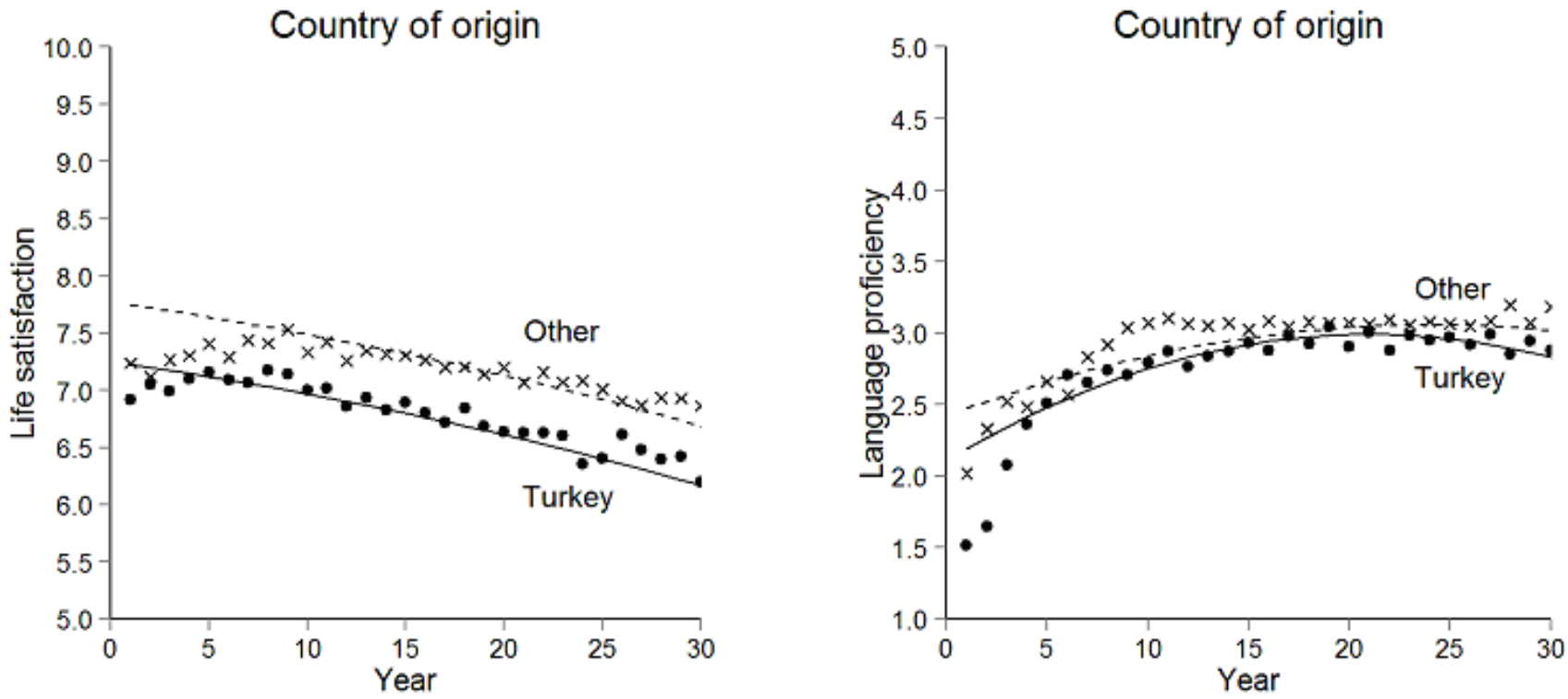
Raw means and predicted trajectories of life satisfaction (right) and identity (left) for different samples



Notes: Circles represent raw means and solid lines represent predicted trajectories of immigrants from Sample B. Exes represent raw means and solid lines represent predicted trajectories of immigrants from other samples. Year on the x-axis refers to number of years after immigration

Figure 9

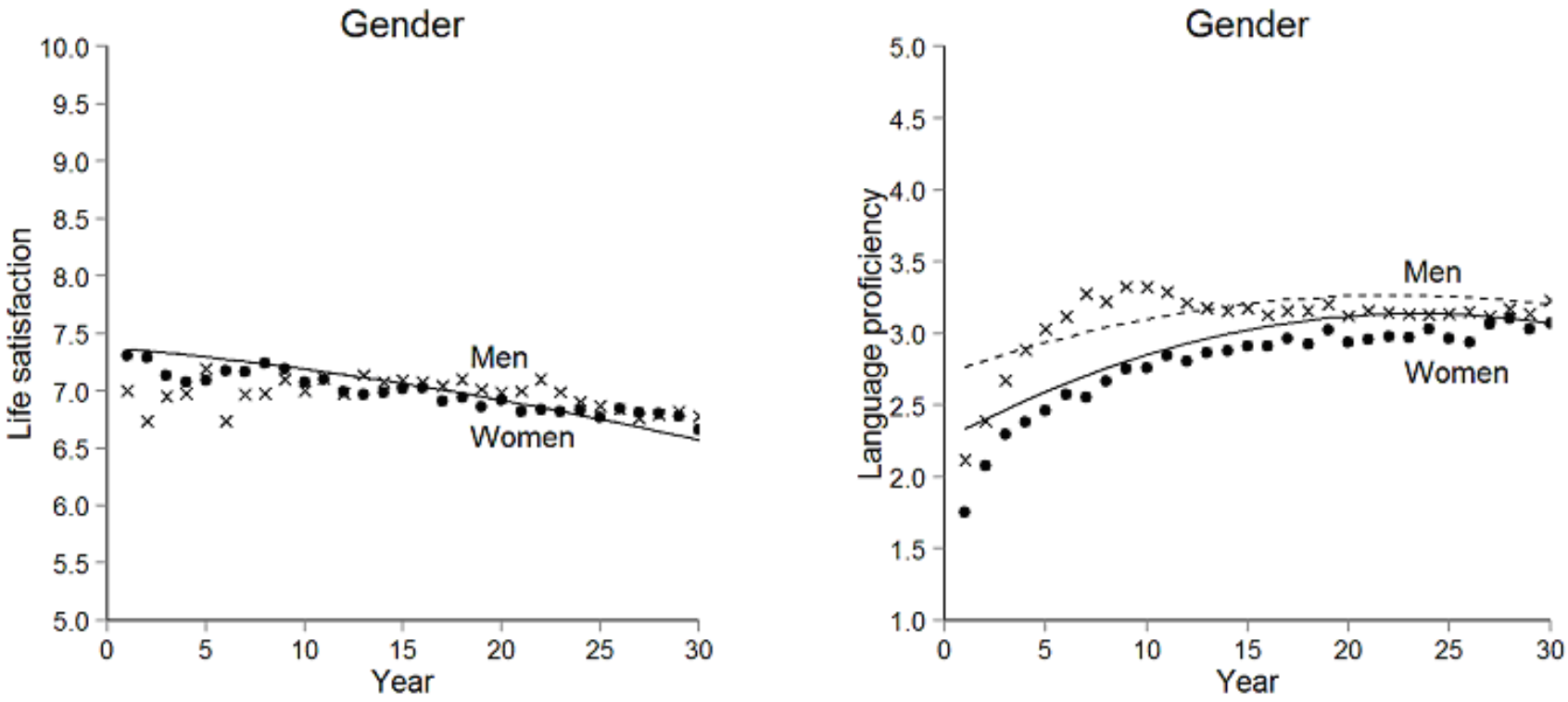
Raw means and predicted trajectories of life satisfaction (right) and identity (left) for immigrants from different countries of origin



Notes: Circles represent raw means and solid lines represent predicted trajectories of Turkish immigrants. Exes represent raw means and solid lines represent predicted trajectories of non-Turkish immigrants. Year on the x-axis refers to number of years after immigration

Figure 10

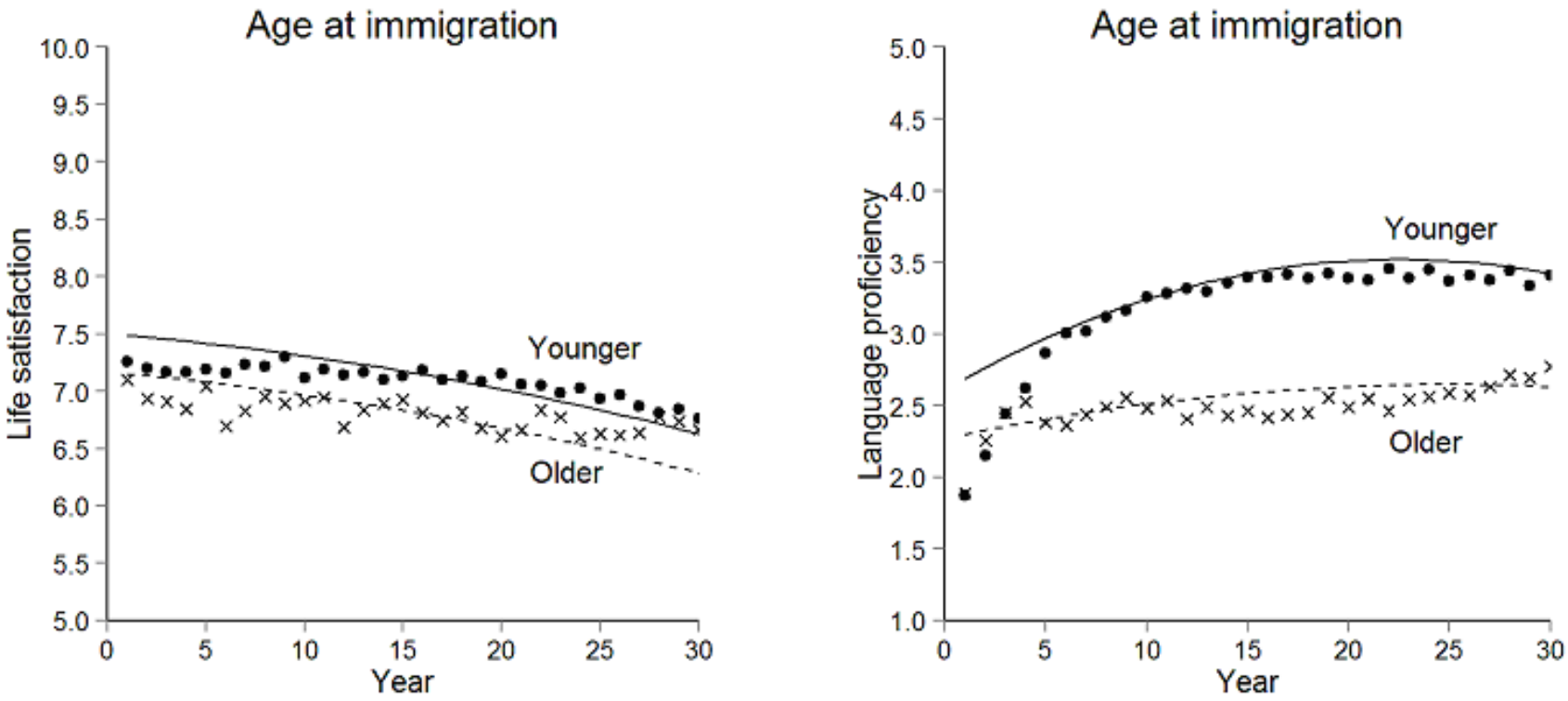
Raw means and predicted trajectories of life satisfaction (right) and identity (left) for women and men



Notes: Circles represent raw means and solid lines represent predicted trajectories of immigrant women. Exes represent raw means and solid lines represent predicted trajectories of immigrant men. Year on the x-axis refers to number of years after immigration

Figure 11

Raw means and predicted trajectories of life satisfaction (right) and identity (left) for people who immigrated at different ages



Notes: Circles represent raw means and solid lines represent predicted trajectories of immigrants who immigrated prior to age of 25. Exes represent raw means and solid lines represent predicted trajectories of immigrants who immigrated after age of 25. Year on the x-axis refers to number of years after immigration

Follow-up analyses: Associations in change over time. As can be seen in the figures, most change in cultural identity and language proficiency occurs in the first 10 years of living in Germany. The steep increase in over the first decade is interesting because it suggests that the development of cultural identity may be especially important early on in the acculturation process. In order to explore whether changes in identity and well-being were related in early years, I set up a bivariate growth model and evaluated the correlations in growth of the two variables over this time period.[6] To simplify the interpretation, I fit a linear model to both life satisfaction and latent identity variables, and this model allowed for covariance between each variable's intercept and slope. In addition, the model estimated four cross-variable covariances: among the life satisfaction and identity intercepts, life satisfaction and identity slopes, life satisfaction intercept and identity slope, identity intercept and life satisfaction slope. Residuals of each variable were also allowed to covary at each measurement occasion, and these were constrained to be equal over time.

Model fit was acceptable according to the RMSEA (.03), although the TLI was below conventional cutoff value (.84).[7] Slope-intercept correlation was -.65 for life satisfaction and -.37 for identity, suggesting that life satisfaction declined most for those who were most satisfied with

[6] I used only the first 10 years following immigration in these analyses because most change in identity appears to occur during this period, and it seemed like a reasonable approach that would maximize detection of any association in change of the two variables. For example, it is possible that fitting the model over the full 30 years would distort the associations that may be particularly important during this time. However, I also tested the model fit to all waves, and same conclusions would be drawn if the entire 30-year period was used. I present the model over the first decade because the linear model describes the data well during this period, which makes the interpretation of results more intuitive.

[7] TLI values tend to be affected by average correlation among the variable in the data. Models fit to variables that are correlated only weakly will have low TLI values (Kenny, 2013). The average correlation among the variables in this dataset was .27. This makes it likely that the TLI value of .84 is an underestimate of the overall model fit.

their life in the first year of living in Germany, and that those who were least identified with Germany at the beginning strengthened their identity the most over time. The two intercepts were correlated at .19. Thus, people who were most satisfied with their life were also more identified with Germany at the time of immigration. The correlation between the slopes was .36, indicating that those whose life satisfaction increased most (or decreased least) also reported most growth in German identity over time. In addition, life satisfaction intercept correlated negatively with change in identity (r = -.37), suggesting that those who were particularly satisfied at the time of immigration showed least growth in German identity over time. On the other hand, starting level of identity was not related to change in life satisfaction over time.

The STARTS Model

The results of the overall STARTS model are shown in Table 9. Twenty-one percent of variance in life satisfaction can be attributed to stable factors, 36% of variance is due to influences that change slowly over time, and 43% of variance is occasion-specific and influenced by factors that include measurement error as well as true short-lived influences. These results are consistent with findings of Lucas and Donnellan (2012) who found that in the entire GSOEP sample 26%, 39%, and 36% of variance in life satisfaction were due to trait, autoregressive, and state influences, respectively. Thus, immigrants' life satisfaction does not appear to be any more or less influenced by changing vs. stable factors than the general population.

The results for identity are shown in the second column of Table 9. Eighty-one percent of variance in latent identity scores is attributable to stable factors, 16% to slowly changing factors, whereas only 3% was occasion specific. In this case, the occasion-specific variance is assumed to be free of measurement error and reflects only true transient influences on identity. Additional occasion-specific variances were found for the three identity items, and these reflect

largely measurement error. The most important finding from these analyses is that identity appears to be highly stable over time and thus is likely to be influenced to a large extent by stable determinants.

Table 9
Results of the STARTS models in the overall sample

	Life satisfaction	Full identity model	German language proficiency
Model fit			
χ^2	907.33	3928.06	623.72
df	451	2114	425
TLI	.97	.94	.99
RMSEA	.01	.01	.01
Model estimates			
T	0.81* (0.09)	0.87* (0.03)	0.87* (0.03)
AR	1.40* (0.08)	0.17* (0.02)	0.17* (0.02)
S	1.67* (0.02)	0.03* (0.01)	0.20* (0.01)
New AR	0.37* (0.02)	0.04* (0.00)	0.04* (0.00)
AR stability	.86* (0.02)	.88* (0.02)	.88* (0.02)
Percentage total variance			
T	21%	81%	70%
AR	36%	16%	14%
S	43%	3%	16%
Factor loadings			
Language proficiency		1.00	
Identity 1		0.44* (0.01)	
Identity 2		0.40* (0.02)	
Residuals			
Language proficiency		0.18* (0.01)	
Identity 1		0.43* (0.01)	
Identity 2		0.33* (0.01)	
Method: Identity 1		0.33* (0.01)	
Method: Identity 2		0.35* (0.02)	

Notes: * $p < .05$. T = stable trait, AR = autoregressive trait, S = occasion-specific state. Identity 1 is the composite of items assessing German and foreign identity directly in the first part of the study. Identity 2 is the composite of items measuring German and foreign identity in the second part of the study.

Changes in influences over time. Table 10 shows the results of analyses that allowed for different amount of state variance and different AR stabilities during three different time periods

(years 1-10, 11-20, and 21-30). Chi squared difference tests suggested that, for life satisfaction, both the amount of state variance and stability of the AR component changed over time. In particular, the amount of variance attributed to occasion-specific influences decreased over time. The pattern of AR stability was much less clear – it was lower in the second decade than in the other two – but it also did not vary dramatically (stabilities were .86, .84, .87) suggesting that the model in which AR stability is constrained to be equal over time may adequately describe the data. For identity, state variance decreased over time, but AR stability remained constant. Thus, for both life satisfaction and identity, the most important changes over time were at the occasion-specific level. Short-term factors were less important for these variables in later years than in earlier years.

Group differences in sources of individual differences. As with the growth models, it was not possible to run multiple group analyses using the full identity model because the computers available did not have enough resources to run these models. However, as Table 9 shows, including only the German language proficiency variable resulted in virtually identical estimates as the full identity model when fit to overall data. The most notable difference was that the state variances were larger in the language-only model because they included both measure-specific state variance (i.e., language item residual from the full identity model) and latent state variance (i.e., state variance from the full identity model). Thus, I proceeded by using only the language proficiency variable for the multiple group analyses. Comparisons of models that put different equality constraints on each of the groups are shown in Table 11, and the results of the analyses with best fitting models are summarized in Table 12 (for life satisfaction) and Table 13 (for identity).

Table 10

Results of STARTS models that tested for different extent of AR and S influences over different periods following immigration

	Life satisfaction			Identity		
	Equal	Different S	Different S, AR stability	Equal	Different S	Different S, AR stability
Model fit						
χ^2	907.33	711.2	704.52	3928.06	3872.53	3868.28
df	451	449	447	2114	2112	2110
TLI	0.97	0.98	0.98	0.94	0.94	0.94
RMSEA	0.01	0.01	0.01	0.01	0.01	0.01
$\Delta\chi^2$		196.13*	6.68*		55.53*	4.25
Δdf		2	2		2	2
Model estimates						
T	0.81* (0.09)	0.80* (0.09)	0.81* (0.09)	0.87* (0.03)	0.88* (0.03)	0.87* (0.03)
AR	1.40* (0.08)	1.40* (0.08)	1.40* (0.08)	0.17* (0.02)	0.17* (0.02)	0.18* (0.02)
S (years 1-10)	1.67* (0.02)	1.92* (0.04)	1.91* (0.06)	0.03* (0.01)	0.06* (0.01)	0.05* (0.01)
S (years 11-20)	1.67* (0.02)	1.80* (0.03)	1.77* (0.03)	0.03* (0.01)	0.03* (0.01)	0.03* (0.01)
S (years 21-30)	1.67* (0.02)	1.41* (0.03)	1.45* (0.03)	0.03* (0.01)	0.00 (0.01)	0.01 (0.01)
New AR (years 1-10)	0.37* (0.02)	0.37* (0.02)	0.37* (0.05)	0.04* (0.00)	0.04* (0.00)	0.05* (0.01)
New AR (years 11-20)	0.37* (0.02)	0.37* (0.02)	0.42* (0.03)	0.04* (0.00)	0.04* (0.00)	0.04* (0.01)
New AR (years 21-30)	0.37* (0.02)	0.37* (0.02)	0.33* (0.03)	0.04* (0.00)	0.04* (0.00)	0.03* (0.01)
AR stability (years 1-10)	.86* (0.02)	.86* (0.02)	.86* (0.03)	.88* (0.02)	.87* (0.02)	.84* (0.04)
AR stability (years 11-20)	.86* (0.02)	.86* (0.02)	.84* (0.02)	.88* (0.02)	.87* (0.02)	.88* (0.03)
AR stability (years 21-30)	.86* (0.02)	.86* (0.02)	.87* (0.01)	.88* (0.02)	.87* (0.02)	.90* (0.02)
Factor loadings						
Language proficiency				1.00	1.00	1.00
Identity 1				0.44* (0.01)	0.44* (0.01)	0.44* (0.01)
Identity 2				0.40* (0.02)	0.40* (0.02)	0.40* (0.02)
Residuals						
Language proficiency				0.18* (0.01)	0.18* (0.01)	0.18* (0.01)
Identity 1				0.43* (0.01)	0.43* (0.01)	0.43* (0.01)
Identity 2				0.33* (0.01)	0.33* (0.01)	0.33* (0.01)

Table 10 (cont'd)

Method: Identity 1	0.33* (0.01)	0.33* (0.01)	0.33* (0.01)
Method: Identity 2	0.35* (0.02)	0.35* (0.02)	0.35* (0.02)

Notes: * $p < .05$. T = stable trait, AR = autoregressive trait, S = occasion-specific state. Identity 1 is the composite of items assessing German and foreign identity directly in the first part of the study. Identity 2 is the composite of items measuring German and foreign identity in the second part of the study.

Table 11

Comparison of multiple group analyses with different constraints on the STARTS models

	Life satisfaction						German language proficiency					
Sample B vs. other samples	χ^2	df	TLI	RMSEA	$\Delta\chi^2$	Δdf	χ^2	df	TLI	RMSEA	$\Delta\chi^2$	Δdf
Equal	2159.34	935	0.93	0.02			1284.95	617	0.97	0.02		
+ different T variances	2158.53	934	0.93	0.02	0.81	1	1253.50	616	0.97	0.02	31.44*	1
+ different S variances	2063.83	933	0.93	0.02	94.70*	1	1239.06	615	0.97	0.02	14.44*	1
+ different AR variances and stabilities	2062.46	931	0.93	0.02	1.37	2	1238.95	613	0.97	0.02	0.11	2
Turkish vs. other immigrants												
Equal	2093.19	932	0.89	0.03			1342.95	878	0.98	0.02		
+ different T variances	2093.15	931	0.89	0.03	0.04	1	1341.71	877	0.98	0.02	1.24	1
+ different S variances	2031.00	930	0.90	0.03	62.16*	1	1319.04	876	0.98	0.02	22.67*	1
+ different AR variances and stabilities	2025.47	928	0.90	0.03	5.53	2	1313.10	874	0.98	0.02	5.94	2
Women vs. men												
Equal	1846.88	935	0.94	0.02			1356.40	882	0.98	0.02		
+ different T variances	1844.39	934	0.94	0.02	2.49	1	1311.53	881	0.98	0.02	44.87*	1
+ different S variances	1843.82	933	0.94	0.02	0.57	1	1307.30	880	0.98	0.02	4.22*	1
+ different AR variances and stabilities	1840.69	931	0.94	0.02	3.13	2	1304.45	878	0.98	0.02	2.86	2
Age at immigration <= 25 vs. > 25												
Equal	2074.48	935	0.93	0.02			2108.05	880	0.94	0.03		
+ different T variances	2034.27	934	0.93	0.02	40.22*	1	2102.51	879	0.94	0.03	5.54*	1
+ different S variances	1981.34	933	0.94	0.02	52.93*	1	2065.88	878	0.94	0.03	36.63*	1
+ different AR variances and stabilities	1958.61	931	0.94	0.02	22.72*	2	2100.47	876	0.94	0.03	-34.59	2

Notes: * $p < .05$. T = stable trait, AR = autoregressive trait, S = occasion-specific state.

Table 12

Results of best fitting STARTS models from multiple group analyses of life satisfaction

	Sample		Country of origin		Gender		Age at immigration	
Model fit								
χ^2	2101.44		2058.84		1846.88		1981.34	
df	934		931		935		933	
TLI	.93		.90		.94		.94	
RMSEA	.02		.03		.02		.02	
	Sample B	Other	Turkey	Other	Women	Men	Younger	Older
Model estimates								
T	0.82* (0.09)	0.82* (0.09)	0.78* (0.12)	0.78* (0.12)	0.81* (0.09)	0.81* (0.09)	0.65* (0.09)	1.16* (0.12)
AR	1.40* (0.08)	1.40* (0.08)	1.43* (0.10)	1.43* (0.10)	1.40* (0.08)	1.40* (0.08)	1.38* (0.08)	1.38* (0.08)
S	1.75* (0.03)	1.41* (0.03)	1.97* (0.04)	1.67* (0.03)	1.67* (0.02)	1.67* (0.02)	1.59* (0.03)	1.83* (0.03)
New AR	0.37* (0.02)	0.37* (0.02)	0.37* (0.03)	0.37* (0.03)	0.37* (0.02)	0.37* (0.02)	0.37* (0.02)	0.37* (0.02)
AR stability	.86* (0.02)	.86* (0.02)	.86* (0.02)	.86* (0.02)	.86* (0.02)	.86* (0.02)	.85* (0.02)	.85* (0.02)
Percentage total variance								
T	21%	23%	19%	20%	21%	21%	18%	27%
AR	35%	39%	34%	37%	36%	36%	38%	32%
S	44%	39%	47%	43%	43%	43%	44%	42%

*Notes: * $p < .05$*. T = stable trait, AR = autoregressive trait, S = occasion-specific state.

Table 13

Results of best fitting STARTS models from multiple group analyses of identity

	Sample		Country of origin		Gender		Age at immigration	
Model fit								
χ^2	1239.06		1319.90		1307.30		2065.88	
df	615		877		880		878	
TLI	.97		.98		.98		.94	
RMSEA	.02		.02		.02		.03	
	Sample B	Other	Turkey	Other	Women	Men	Younger	Older
Model estimates								
T	0.81* (0.03)	1.22* (0.08)	0.79* (0.03)	0.79* (0.03)	1.04* (0.04)	0.73* (0.03)	0.82* (0.04)	0.96* (0.05)
AR	0.17* (0.02)	0.17* (0.02)	0.17* (0.02)	0.17* (0.02)	0.17* (0.02)	0.17* (0.02)	0.17* (0.02)	0.17* (0.02)
S	0.21* (0.01)	0.16* (0.01)	0.23* (0.01)	0.20* (0.01)	0.20* (0.01)	0.21* (0.01)	0.22* (0.01)	0.18* (0.01)
New AR	0.04* (0.00)	0.04* (0.00)	0.04* (0.00)	0.04* (0.00)	0.04* (0.00)	0.04* (0.00)	0.04* (0.00)	0.04* (0.00)
AR stability	.88* (0.02)	.88* (0.02)	.88* (0.33)	.88* (0.03)	.88* (0.02)	.88* (0.02)	.88* (0.02)	.88* (0.02)
Percentage total variance								
T	68%	79%	66%	68%	74%	66%	68%	73%
AR	14%	11%	14%	15%	12%	15%	14%	13%
S	18%	10%	19%	17%	14%	19%	18%	14%

Notes: * $p < .05$. T = stable trait, AR = autoregressive trait, S = occasion-specific state.

Sample differences. The best fitting model for life satisfaction allowed for differences in state variances, with participants in Sample B being more influenced by occasion-specific factors than participants in other samples. For language proficiency, the best fitting model allowed for group differences in trait and state variances. Individual differences in proficiency of participants in Sample B were influenced to a lesser degree by stable factors, and to a greater degree by occasion-specific factors, relative to participants from other samples.

Differences related to country of origin. For both life satisfaction and language proficiency, it was necessary to allow for differences in state variances between the groups. In particular, Turkish immigrants' life satisfaction and proficiency were both more influenced by occasion-specific factors than were life satisfaction and proficiency of immigrants of other nationalities.

Gender differences. There were no group differences in the extent to which life satisfaction of women and men was influenced by trait, state, and autoregressive factors. For language proficiency, it was necessary to allow for group differences in trait and state variances. Women's proficiency scores were affected more by stable factors and less by occasion-specific factors than men's scores.

Differences related to age at immigration. For life satisfaction, the best fitting model allowed for differences in trait and state variance and AR variance and stability. However, when this model was specified trait variance estimates were equal for the two groups (0.77). In this case, the AR variance was both larger (1.87 vs. 1.20) and more stable (.88 vs. .84) for the older group. This trend can be captured by allowing trait components to vary rather than AR components, which would result in a more parsimonious model (Anusic, Lucas, & Donnellan, 2012). In addition, allowing for differences in T (rather than AR) components allows for test of

group differences in the effects of life satisfaction on identity and identity on life satisfaction. Given these considerations, I decided to keep the model that allowed only T and S components to vary across different age groups. Accordingly, life satisfaction of those who were younger at the time they immigrated to German (i.e., <= 25 years) was in general less stable over time. Stable trait accounted for less variation in younger immigrants' life satisfaction scores. Occasion-specific factors also accounted for a smaller amount of total variance. However, because life satisfaction of younger immigrants was less variable in general, the proportion of the variance accounted for by occasion-specific factor was actually larger relative to older immigrants (18% vs. 14%).

For language proficiency, the best fitting model allowed for differences in T and S factors. Individual differences in proficiency of younger immigrants were somewhat less stable than identity of those who immigrated in adulthood (i.e., after age of 25) – younger immigrants' language proficiency was less influenced by stable trait factors and more influenced by occasion-specific factors.

Bivariate STARTS model. The results of the STARTS model fit to life satisfaction and identity simultaneously can be seen in Table 14.[8] The most important finding is that the majority of the association between identity and life satisfaction – 65% of total covariance – appears to be at the trait level (r = .21). This suggests that identity and life satisfaction are influenced by common stable factors. In addition, there were significant correlations between state factors (r = .12), suggesting that there are also some temporary influences that affect both life satisfaction and identity. The finding that the association between the initial AR factors was not statistically

[8] I also tested the possibility that residual method variances of the two identity indicators were related to trait life satisfaction. The addition of these two covariances did not result in significant improvement of model fit ($\Delta\chi^2$ = 4.14, df = 2, ns), and neither covariance was statistically significant.

Table 14
Results of the bivariate STARTS models

	Full identity model and life satisfaction	Language proficiency and life satisfaction
Model fit		
χ^2	8797.16	2569.09
df	4817	1724
TLI	.92	.98
RMSEA	.01	.01
Model estimates		
Life satisfaction: T	0.80* (0.09)	0.80* (0.09)
Life satisfaction: AR	1.41* (0.08)	1.41* (0.08)
Life satisfaction: S	1.68* (0.02)	1.68* (0.02)
Life satisfaction: New AR	0.37* (0.02)	0.37* (0.02)
Life satisfaction: AR stability	.86* (0.02)	.86* (0.02)
Identity: T	0.87* (0.03)	0.87* (0.03)
Identity: AR	0.17* (0.02)	0.17* (0.02)
Identity: S	0.03* (0.01)	0.20* (0.01)
Identity: New AR	0.04* (0.00)	0.04* (0.00)
Identity: AR stability	.88* (0.02)	.88* (0.02)
Cross-lagged effects		
Life satisfaction → identity	0.00 (0.01)	0.00 (0.01)
Identity → life satisfaction	0.00 (0.04)	0.00 (0.04)
Covariances		
T	0.17* (0.04)	0.17* (0.04)
AR	0.06 (0.04)	0.07 (0.04)
New AR	0.01* (0.01)	0.02* (0.01)
S	0.03* (0.01)	0.02* (0.01)
Correlations		
T	0.21* (0.04)	0.21* (0.04)
AR	0.13 (0.08)	0.14 (0.08)
New AR	0.12* (0.06)	0.13* (0.06)
S	0.12* (0.04)	0.04* (0.01)
Factor loadings		
Language proficiency	1.00	
Identity 1	0.44* (0.01)	
Identity 2	0.40* (0.02)	
Residuals		
Language proficiency	0.18* (0.01)	
Identity 1	0.43* (0.01)	
Identity 2	0.33* (0.01)	
Method: Identity 1	0.33* (0.01)	
Method: Identity 2	0.35* (0.02)	

Notes: * $p < .05$. T = stable trait, AR = autoregressive trait, S = occasion-specific state. Identity 1 is the composite of items assessing German and foreign identity directly in the first part of the

study. Identity 2 is the composite of items measuring German and foreign identity in the second part of the study.

significant, but the association between the new AR disturbances was (r = .12) is more difficult to interpret, but it suggests that slowly changing factors that affect life satisfaction and identity may be independent at first but over time become increasingly common. To test this idea, I created a model that allowed the covariance between the new AR components to vary over time. Specifically, I constrained covariances to be equal within each 10-year period following immigration but allowed them to differ across these time periods (i.e., years 1-10, 11-20, 21-30). This model fit better than the fully constrained model ($\Delta\chi^2$ = 6.22, df = 2, p < .05). The results again showed that the initial AR variance was not statistically significant (*covAR* = .04, *SE* = .04, *ns*), and neither were covariances between the new AR components during the first (*covNew* = .01, *SE* = .01, *ns*) and second (*covNew* = .01, *SE* = .01, *ns*) decades following immigration. However, in the third decade, there was a significant relationship between the two components (*covNew* = .03, *SE* = .01, p < .01). These findings suggest that the slowly changing influences on identity and life satisfaction become increasingly common.

After accounting for covariance at the stable, autoregressive, and occasion-specific level, there were no significant over time effect of life satisfaction on future identity, or of identity on life satisfaction. The cross-lagged effects estimates were all exactly zero.

Group differences in relationship between identity and life satisfaction. As for previous analyses involving multiple groups, I used language proficiency as an indicator of cultural identity. As Table 14 shows, results of the overall bivariate model fit to the whole dataset were virtually identical for the full identity model and language proficiency. The largest difference was in the state estimates, which included measurement error in the model with the proficiency

variable only, but not in the one that included the full model of cultural identity. Table 15 shows the comparisons of multiple group bivariate STARTS models that allowed for different covariances among groups. Equal covariance constraints were initially put only on those variance components that did not differ among the two groups (established by multiple group analyses of single variable STARTS models). Namely, the for the comparison of Sample B and other samples, women and men, and younger and older immigrants, the base model allowed covariances between T and S factors to differ among groups, but constrained covariances between initial AR factors, new AR factors, and cross-lagged effects of life satisfaction on future language proficiency and language proficiency on future life satisfaction to be equal for each set of group comparisons. In the next step, covariances between AR and new AR components were allowed to differ, and in the final step the cross-lagged effects were also allowed to differ across groups. For the comparison of Turkish to other immigrants, the initial model also allowed for different covariances between the T components because previous analyses indicated that the T variance neither life satisfaction and identity varied across groups. In this case, the second model relaxed the equivalence constraint on the T covariances, the third model allowed the AR and new AR covariances to differ, and the third model also allowed the cross-lagged effects to differ across the groups.

No group differences were found with one exception: the model that allowed for a different effect of life satisfaction on future proficiency, and a different effect of proficiency on future life satisfaction for women and men fit better than the model that constrained these paths to be equal. However, the estimates of both effects were still small and not significantly close to zero: life satisfaction → language proficiency path was 0.00 (*SE* = 0.01, *ns*) for women and 0.01 (*SE* = 0.01, *ns*) for men, and the language proficiency → life satisfaction path was 0.05 (*SE* =

0.05, *ns*) for women and -0.03 (*se* = 0.06, *ns*) for men. Thus, once covariance at the stable trait, autoregressive, and occasion-specific levels were accounted for, there was no additional effect of life satisfaction (or proficiency) on future proficiency (or life satisfaction).

Table 15
Comparison of multiple group analyses with different constraints on covariances in the bivariate STARTS models

	χ^2	df	TLI	RMSEA	$\Delta\chi^2$	Δdf
Sample B vs. other samples						
Equal	5580.60	3106	.94	.02		
+ Different AR and New AR covariances	5579.88	3105	.94	.02	0.73	1
+ Different cross-paths	5576.04	3103	.94	.02	3.84	2
Turkish vs. other immigrants						
Equal	5994.33	3500	.92	.02		
+ Different T covariances	5994.23	3499	.92	.02	0.1	1
+ Different AR and New AR covariances	5994.12	3498	.92	.02	0.1	1
+ Different cross-paths	5989.26	3496	.92	.02	4.87	2
Women vs. men						
Equal	5810.31	3513	.94	.02		
+ Different AR and New AR covariances	5806.64	3512	.94	.02	3.66	1
+ Different cross-paths	5799.47	3510	.94	.02	7.18*	2
Age at immigration <= 25 vs. > 25						
Equal	6643.37	3507	.91	.02		
+ Different AR and New AR covariances	6643.14	3506	.91	.02	0.24	1
+ Different cross-paths	6640.78	3504	.91	.02	2.36	2

*Notes: * p < .05*. T = stable trait, AR = autoregressive trait, S = occasion-specific state. In the models with equal covariances, only the covariances of variance comonents that did not differ among groups were constrained to be equal.

Follow-up analyses: Accounting for trait-level association between identity and life satisfaction. Majority of the covariance between life satisfaction and cultural identity was found at the trait level, suggesting that there are common stable influences on both variables. One possible common influence may be personality. A meta-analysis by Anusic & Schimmack (2013) suggests that individual differences in personality in adulthood tend to be highly stable – 83% of reliable variance shows complete stability over a period of 15 years. Theory and

empirical findings indicate that personality traits influence a wide range of thoughts, feelings, and behaviours (Funder, 2012). Some of these thoughts, feelings, and behaviours are likely relevant for both well-being and sense of identity. For example, past research has found that individual differences in personality traits account about a quarter of reliable variance in life satisfaction (Steele, 2008). Clancy and Dollinger (1993) suggested that personality may impact overall identity development that occurs throughout adolescence and emerging adulthood, and Ryder, Alden, and Paulhus (2000) came to the same conclusions regarding cultural identity of immigrants. Namely, Ryder et al. (2000) found that conscientiousness, extraversion, neuroticism, and openness to experience were related to development of national identity in a sample of Asian immigrants to Canada. For these reasons, personality seems to be a good candidate for a variable that may explain the stable link between well-being and cultural identity.

In order to test the theory that personality is a stable factor that contributes to the association between life satisfaction and identity, I regressed both life satisfaction and cultural identity trait factors on the Big Five personality traits.[9] This led to reduction of covariance between life satisfaction and identity trait factors (without personality $cov = 0.17$, $p < .05$, with personality $cov = 0.06$, *ns*). Neuroticism was negatively related, and extraversion, openness to experience, and conscientiousness were positively related to both life satisfaction and identity. In addition, agreeableness was positively related to life satisfaction, but was not significantly related to identity. These results suggest that personality may be one of the stable common

[9] The Big Five were measured twice during the study, the first time in wave 22 and the second time in wave 26. I averaged each score over the two waves in order to get an estimate of stable traits. The items were as follows. Agreeableness: "Am sometimes too coarse with others", "Able to forgive", and "Friendly with others"; Conscientiousness: "Thorough worker", "Tend to be lazy", and "Carry out tasks efficiently"; Extraversion: "Am communicative", "Am sociable", and "Reserved"; Neuroticism: "Worry a lot", "Somewhat nervous", and "Deal well with stress"; Openness to experience: "Am original", "Value artistic experiences", and "Have lively imagination."

influences on life satisfaction and cultural identity. As such, personality is partially responsible for the association between these two variables.

DISCUSSION

The link between cultural identity and well-being is often emphasized in identity research. However, little work so far has been done to evaluate the sources of this association. The current study provided first long-term description of longitudinal trajectories of cultural identity and life satisfaction of immigrants to Germany. In addition, stability of individual differences in cultural identity has been virtually unexamined in the past. In this study I used longitudinal models to evaluate relative contribution of stable and changing influences on cultural identity. Several important differences in the development of cultural identity and life satisfaction among different groups of immigrants also emerged.

Cultural identity is theorized to consist of two independent dimensions: ethnic identity, or identification with the culture of the country of origin, and national identity, or identification with the host culture. This independence was not replicated in this dataset. Direct measures of German and ethnic identity correlated highly in the sample and were thus combined into a single measure of cultural identity. This has important implications for the theory of acculturation strategies (Berry, 1997). According to this theory, immigrants may independently work on maintaining the culture of their country of origin and strengthening their identification with the culture of the host country, and this process results in four acculturation strategies: integration – development and maintenance of both ethnic and national identity, separation – maintenance of ethnic identity only, acculturation – strengthening of national identity only, and marginalization – distancing from both cultures. However, the relatively high correlation between ethnic and national identities suggests that that it may not be possible to adopt any of these four strategies in every host culture. Furthermore, ethnic identity showed small but negative correlations with life satisfaction, suggesting that integration and separation may not be optimal strategies for

immigrants to Germany, contrary to Berry's (1997) hypothesis that integration strategy would lead to best outcomes for immigrants. Nonetheless, the unidimensionality of cultural identity is consistent with the assumptions and predictions of social identity theory (Tajfel & Turner, 1979), according to which people strive to distance themselves from the negatively evaluated group and instead identify with a more positively evaluated group whenever such change is possible. In the case of Germany, where multiculturalism is not desirable and assimilation is highly encouraged, evaluations of German and ethnic groups are clear, and they are favourable only to groups who identify as Germans.

Thus, for the remainder of discussion I simply refer to *cultural identity* to describe identification of immigrants in Germany. In this context, cultural identity means high sense of national (German) identity and a low sense of ethnic identity. I first describe trajectories and observed group differences in the trajectories. Then I discuss the results of the STARTS models that investigated stability and change in life satisfaction and cultural identity of immigrants. Finally, I discuss the results of the bivariate models that evaluated sources of association between these two variables.

Overall trajectories

The first goal of the study was to describe trajectories of cultural identity and well-being of immigrants over time. To my knowledge, this is the first longitudinal study to follow immigrants over such long time period.

The results suggested that life satisfaction showed a decline over time. However, the magnitude of this decline was consistent with the panel conditioning effects found for life satisfaction in the GSOEP (Baird et al., 2010). Baird et al. (2010) found that GSOEP participants tend to rate their satisfaction 0.03 points lower each year that they are in the study, and that this

trend is independent of age or cohort. Thus, the decline observed in life satisfaction of immigrants over time may simply reflect the panel conditioning effect. On the other hand, it is possible that immigrants' life satisfaction may be especially high in the year in which they move to a new country when they are optimistic about their future, and that it tends to decline as they adapt to their new life. Indeed, past research has shown that people's life satisfaction changes around the time they experience important life changes, but that over time they show at least some adaptation to the new circumstances (Yap et al., 2012). Thus, the declining trend may reflect adaptation to this big life change, but it may also reflect unmet expectations over time or simply adaptation to the life in the new country.

Over time, immigrants reported strengthened identification with Germany. Changes in identity were especially pronounced during the first decade, and after 15 years identity reached a stable level at which it remained. Although no longitudinal studies have been done to examine trajectories of cultural identity over time, some studies have looked at number of years in the country as a predictor of cultural identity. These studies have generally found a positive association between national identity and length of time in the country (e.g., Birman, Persky, & Chan, 2010; Zimmermann, Zimmermann, & Constant, 2007). An important finding that emerged is that the stable level is still not close to the scale's maximum. Thus, there is still an opportunity for growth in identity. This is an important finding for policy makers of countries who strive to increase integration, as they may wish to focus on developing programs that will lead to higher integration of immigrants to their countries.

The results indicated that the first decade is particularly important for development of identity. In addition, the results of the bivariate growth model suggested that during this period changes in identity were positively related to changes in life satisfaction over time. Thus, those

who reported greatest increases in identity during the first 10 years in Germany also reported more increases (or less decreases) in well-being over this period. Identity and life satisfaction were also related at the start of the study, as those who were more strongly identified with Germany also were most satisfied with their life in the year of immigration. This could be because those who were most identified were able to fit into the German way of life or experienced least discrimination in that first year, leading to higher life satisfaction. Differences in motivation to immigrate may also contribute to this link – immigrants who willingly planned a move to Germany because they wanted to become a part of German culture may also be more satisfied than immigrants who were forced to immigrate abruptly (e.g., refugees) and thus did not feel the sense of belonging immediately upon arrival to Germany. Interestingly, starting levels of life satisfaction were negatively correlated with change in identity. Those who were better off initially reported least growth in identity over time. This may reflect the finding that people who were most satisfied with their life initially were also most identified with Germany to begin with and that those who were most identified with Germany showed least change over time. On the other hand, the explanation may be motivational – those who are least satisfied with their life circumstances upon moving to Germany may be most motivated to acculturate because they may assume that acculturation will lead to increased satisfaction.

Group differences in trajectories. Another goal of this study was to explore potential moderators of development of life satisfaction and identity of immigrants. In general, group differences were found for both life satisfaction and identity. For life satisfaction, group differences were most often observed in the overall level (but not the trajectories), whereas identity trajectories differed in important way for some of the groups.

Sample differences. Although enduring life satisfaction differences were found for several group comparisons, group differences in life satisfaction trajectories could only be seen across samples: participants from Sample B, who originally arrived in Germany under the guest worker program, reported higher initial life satisfaction, but more decline in life satisfaction over time relative to other samples. I considered the possibility that this difference was an artifact of the known panel conditioning effects, because participants from Sample B would have been, on average, in the study for a longer period of time. However, similar trend is observed if life satisfaction scores are first adjusted for panel conditioning (by adding 0.03 to each person's score for each year that that person has been in the study). This information may be valuable for policy makers who may be considering different immigration program options. For example, they may wish to consider differences in experiences of migrant workers and immigrants form other samples in the early years during which there are visible differences in well-being versus later years, when well-being of the two groups equalizes.

Sample differences in language proficiency were consistent and moderate to large in magnitude (0.77 points, or 0.77 standard deviations at the between-person level). Immigrants from Sample B reported being less proficient initially and these differences remained over time. A likely reason for this is that the immigrants brought into Germany through the guest worker program were recruited as labourers for the industrial sector jobs that did not require full language proficiency. In addition, because the guest worker program targeted large numbers of immigrants from only a few nations, immigrants could form social networks with their compatriots and retain low levels of German language proficiency. These factors likely led to low levels of German identity in Sample B. Interestingly, although Sample B immigrants' language proficiency increased over the first decade, it remained stable at a relatively low level

in the remaining years. This suggests that initial integration may play an especially important role for later integration. Immigrants who do not integrate into the host society early on, either because of lack of support from the host society or because their intentions are not to remain in the country long-term, show lower levels of long-term integration. This may be due to low motivation (e.g., they have established social networks of compatriots), or they get accustomed to being perceived as foreigners and incorporate this perception into their identity (Berry, 1997). Understanding the link between early and later acculturation strategies has important implications for immigration policies. For example, in order to make the acculturation or integration process easier and more successful for both immigrants and host societies, countries may wish to offer orientation programs that offer resources for acculturation, including language instruction, to future immigrants even prior to immigration.

Differences related to country of origin. There were some notable group differences in the trajectories of life satisfaction. Turkish immigrants rated their well-being consistently lower than immigrants who moved to Germany under similar circumstances but whose minority status was generally less visible (i.e., immigrants from former Yugoslavia, Spain, Greece, and Italy). Existing research suggests that this difference may be due to higher discrimination experienced by Turkish immigrants. According to a recent report on discrimination in Germany, on average 31% of Turkish immigrants and 31% of immigrants from other visible minority groups (African, Asian, Latin American) experienced discrimination on the employment market, while seeking housing, and from authorities or other public office employees, whereas only 13% of immigrants from the countries of the European Union reported experiencing such discrimination (Federal Anti-Discrimination Agency, 2012). That discrimination is linked to lower well-being is well-documented (Branscombe, Schmitt, & Harvey, 1999; Sellers, Copeland-Linder, Martin, &

Lewis, 2006). Thus, it is likely that the lower life satisfaction of Turkish immigrants is due to their greater experience of discrimination.

Regarding language, Turkish immigrants were initially less proficient in German language than immigrants from former Yugoslavia, Spain, Greece, and Italy, but they quickly caught up. The small initial differences may be due to the fact that German may be more difficult to learn for Turkish language speakers than for speakers of other languages from Sample B. Indeed, Serbian/Croatian, Spanish, Greek, and Italian languages are more closely related to German and belong to the same language family (Indo-European languages); Turkish, on the other hand, belongs to the Altaic family of languages. In any case, differences in language are small and become even smaller over time. This pattern suggests that language proficiency is likely not an important cause of life pervasive differences in life satisfaction observed between immigrants of Turkish and other backgrounds.

Gender differences. No gender differences in either initial levels of life satisfaction or change in life satisfaction over time were observed. There were gender differences in language proficiency in the first decade of living in Germany, with men reporting greater proficiency, however these differences were largely eliminated over time. Past theories have suggested that gender plays a role in the process of acculturation of immigrants (Berry, 1997; Phinney et al., 2001). For example, there are greater expectations of women to maintain their old culture, and certain cultural constraints limit women's integration into new societies whose values may not match the values of the culture of origin. Although here we see a trend for women to show a slower rate of integration into German culture, this trend does not appear to be enduring. In the long run, women seem to integrate into the society just as well as men do, but they may take longer to do so, suggesting that the processes of integration may indeed differ across gender.

However, these differences in acculturation are not reflected in well-being trajectories, as there were no notable gender differences in life satisfaction at any point following immigration.

Differences related to age at immigration. Life satisfaction was also generally lower for people who immigrated after the age of 25 than younger immigrants. Past theoretical work has suggested that age at immigration may play an important role for well-being of immigrants (Berry, 1997; Phinney et al., 2001). However, very few studies have been able to evaluate this claim because for the most part age range of participants in existing studies was quite narrow (usually school-aged children). It is now well-established that children who moved to a new country at a very young age are at less risk for mental health problems than those who immigrated as adolescents (Berry, 1997). However, age of immigration may also matter for adults. For example, Beiser et al., 1988 reported that senior immigrants are more susceptible to mental health issues than younger adult immigrants. The current study adds to the existing literature on immigration and provides first evidence that the role that age at immigration plays in determining immigrants' well-being is enduring.

Another explanation for this finding is that the life satisfaction difference simply reflects declines in life satisfaction that occur with age in general populations (i.e., older people are less satisfied). However, there are at least two reasons why this is an unlikely explanation. First, Baird et al. (2010) have examined changes in mean life satisfaction over the lifespan in the GSOEP and found that life satisfaction scores remained fairly stable from teenage years until the age of 70, after which they steeply declined. If aging was the only source of life satisfaction change in immigrants then we should see a steeper decrease over time for older immigrants as they reach very old age. As the means in Figure 11 show, this is not the case. Second, models that use more age groups suggest a linear trend for life satisfaction differences. It is not the case,

for example, that only the oldest immigrants are less satisfied than the younger groups – each successive age group is less satisfied than the younger group. Together, these findings suggest that the observed age differences in life satisfaction of immigrants are largely due to age at immigration rather than normative aging declines in well-being.

Age differences were also found for language proficiency over time. Although younger and older immigrants were equally proficient in German language at the time of arrival to Germany, younger immigrants quickly became more proficient. As can be seen in Figure 11, the difference between older and younger immigrants is close to 1 point, or 1 standard-deviation at the between-person level – a non-trivial effect. Language barriers can have negative implications for broad range of outcomes, such as development of social networks, employment, and becoming a citizen. In turn, these outcomes affect psychological sense of national identity and belonging. It is possible that lower language proficiency may be one of the factors behind lower life satisfaction of older, relative to younger, immigrants.

Sources of individual differences in life satisfaction and identity

The trajectories offer insight in mean level change over time without providing insight into determinants of individual differences. The STARTS models can tell us about relative contribution of stable and changing determinants on cultural identity and life satisfaction. These models suggested that life satisfaction of immigrants is similarly influenced by stable and changing factors as the general population. Stable factors accounted for 21% of observed variance, slowly changing factors accounted for 36%, and the remaining 43% of variance was occasion-specific. The largest difference between immigrants and general population was that life satisfaction of immigrants may be influenced by occasion-specific factors more than the remainder of the population, although the difference is relatively small (43% vs. 36%). This may

reflect more frequent changes in life circumstances of immigrants relative to native residents, which is likely because immigrants are faced with new experiences, changes in income, and changing social circles. Alternatively, because occasion-specific variance contains errors in measurement, this difference may simply reflect greater measurement error in immigrant populations that is due to factors such as language proficiency limitations. Both of these explanations are also consistent with the finding that occasion-specific variance is reduced over time in the immigrant samples. This may reflect less frequent changes in their life circumstances as they become adjusted to their new life and their environments become more stable, or their response may become less contaminated by measurement error as they become more proficient in communication in German.

Identity was surprisingly stable over time. The results suggested that 81% of variance in the latent variable was stable over the period of 30 years, and thus due to stable influences. The full identity model was also able to separate unreliable variance specific to each indicator of identity (e.g., measurement error) from the latent identity variance. These results suggested that once measurement error is excluded, only 3% of latent variance was occasion-specific. Thus, short-lasting changes in immigrants' lives do not appear to have a major effect on their identity. Rather, individual differences in identity appear to be quite stable, so that people who are more highly identified with Germany when they first arrive tend to also be more identified than their peers even decades after. This is an important contribution to the literature on identity that has so far largely ignored the issues of stability of identity. This finding also has important implications for theories of identity of immigrants. Consistent with these findings, theories of identity development generally posit that once identity is affirmed it tends to remain affirmed and not change (Erikson, 1968; Marcia, 1966; Phinney, 1989). However, these theories also posit a

period of identity *exploration* which precedes identity affirmation. In the case of immigrants, this period would presumably occur after immigration, as immigrants explore and learn about their new culture. It is curious, then, that we see such a large trait component, which reflects stability immediately following immigration. This suggests that the process of exploration and development of identity may occur rather quickly in the first year of living in a new country after which it becomes crystallized. Alternatively, individual differences in identity may be heavily influenced by pre-immigration variables (which remain stable after immigration), such as personality, education, socio-economic status, or by certain experiences that are stable throughout immigrants' lives (e.g., level of discrimination).

Another interesting finding is although small to begin with, the influence of occasion-specific factors that affect identity decreased even more over time, becoming virtually non-existent in the third decade of living in Germany. This suggests that identity is overall quite resilient to temporary fluctuations, but is instead more responsive to longer lasting changes in life. High stability of both life satisfaction and identity autoregressive component suggest that even those influences that change over time tend to persist. That is, these influences likely reflect factors that once they change they tend to stay like that for longer periods of time, or in other words they change slowly over time. Some of these may include changes in income, employment, and housing. Identifying these changing influences may provide particularly important insights for theories of identity development.

Group differences in sources of individual differences. Generally, group differences were found in the amount of occasion-specific variance in life satisfaction and language proficiency. Thus, groups differed in the extent of short-term influences on these variables. However, these differences tended to be small reflecting differences of only about 1% to 5% in

the relative proportion of occasion-specific variance. These may reflect group differences in measurement error (e.g., due to language barriers) or differences in true transient influences on life satisfaction and language proficiency.

More interesting differences were found at the trait level. For life satisfaction, the only group difference was for age: life satisfaction of older immigrants, compared to younger immigrants, was more influenced by stable determinants. These results are also consistent with the findings of other studies that the stable trait component of the STARTS model generally contributed more to older individuals' overall variance in life satisfaction compared to younger individuals in the general samples (Anusic & Schimmack, 2013; Lucas & Donnellan, 2007). Typically, this finding is interpreted as reflecting greater stability of older individuals' life circumstances, so it is interesting to see this pattern in the sample of immigrants, whose life circumstances change greatly with immigration regardless of age. Still, older immigrants may encounter less overall change than younger immigrants who, in addition to adjusting to the life in a new country, also have to resolve developmental roles (e.g., starting a family, settling into a career). However, older immigrants may also have to renegotiate the roles that they have developed within the context of their old culture (e.g., family roles may change) and they have their own developmental challenges to resolve (e.g., retirement, health problems). Thus, to the extent that both older and younger immigrants experience quite a bit of change in their life circumstances, this finding may point to some psychological process that leads to stability in life satisfaction over the lifespan – perhaps strategies people use to cope with changing circumstances change with time (e.g., Folkman, Lazarus, Pimpley, & Novacek, 1987). Thus, older immigrants' prior experiences may make them more resilient to changes they encounter after immigration.

Group differences in the extent to which stable influences affect individual differences in language proficiency were found among different samples, across gender, and for people who immigrated early on versus later in life. These results suggest that identity of immigrants from Sample B, men, and younger immigrants' was influenced to a lesser extent by stable factors than that of immigrants from other samples, women, and older immigrants.

Determinants of identity for participants in Sample B varied more over time. This may reflect the unique conditions under which these immigrants came into the country. As temporary workers, they likely planned to return to their home country in the near future. In this case, there would be very little motivation for development of German identity. However, as they settled more permanently into the country, these motivations likely changed over time. Indeed, initial motivations and expectations are thought to play a role in how immigrants experience and cope with the stressors of immigration, the acculturation strategies they adopt, and their ultimate cultural identity (Berry, 1997).

The finding that women's cultural identity is more stable than men's is also consistent with the idea that women are women are more likely to carry on the culture – women are more likely to stay at home (rather than finding employment) then men, and they're more likely to follow and maintain dress, customs, and values of their ethnic culture (Phinney et al., 2001). Immigrant women who come from cultures that are more similar to German culture may adopt a new cultural identity quicker than women from more dissimilar cultures. Thus, culture of origin may be a more important stable determinant for development of cultural identity for women than for men.

Finally, stable determinants played a larger role for identity of older immigrants than younger immigrants. Environmental stability may not be the most important factor at play here

because both younger and older immigrants are placed into a new environment where their identity is challenged and developed. Rather, past experiences may be a pre-existing stable determinant that affects development of identity – older immigrants have had more exposure to their culture of origin and their development of the new cultural identity may be more influenced by these prior experiences than that of younger immigrants. Indeed, identity theories suggest that identity development is a task of adolescence and young adulthood (Erikson, 1968). Younger immigrants' identity, including cultural identity, is thus expected to be more malleable and influenced by the experiences they encounter in the new culture.

Sources of association between identity and life satisfaction

An important contribution of this paper was that by using bivariate STARTS models I was able to separate sources of association between life satisfaction and cultural identity. Traditionally, a correlation between the two variables measured concurrently is reported, yet this correlation tells us very little about the underlying reasons for the relationship between the two variables. A very basic question that cannot be answered in single-assessment designs is whether the observed relationship between the two variables persists over time or is transient and specific to the time of measurement. These two scenarios would have very different implications for theories that link identity to well-being.

The most important finding from the bivariate model is that the majority of covariance between life satisfaction and identity (65%) is found at the stable level. This suggests that there are common stable influences that affect both well-being and cultural identity, and that these stable influences are largely responsible for the association that we observe between these variables. Further analyses suggested that personality may be one important common influence. Personality is an important psychological construct that affects a wide range of people's

thoughts, feelings, and behaviours, and individual differences in personality tend to remain relatively stable throughout adulthood (Anusic & Schimmack, 2013). However, although past research has found, as this study did, that neuroticism, extraversion, openness, and conscientiousness were related to national identity of immigrants to North America (Ryder et al., 2000), this study provides the first demonstration that personality may play a role in linking cultural identity and life satisfaction. This finding is valuable for understanding how immigrants adapt to the new culture, but it will be important for future research to understand why personality is important. For example, neuroticism may affect immigrants' appraisal of stressful events, including discrimination, which may have an effect on both development of identity and well-being (Gunthert, Cohen, & Armeli, 1999). Extraversion may be important for building social networks, which may lead to higher sense of belongingness and life satisfaction (Oishi & Schimmack, 2010). On the other hand, personality may also affect life satisfaction and identity in the same direction, but through independent mechanisms. For example, extraversion may have an effect on cultural identity through development of social networks and support, whereas it may be related to life satisfaction by predisposing individuals to feel more positive emotions.

In addition to personality, Berry (1997) has emphasized a number of stable factors that may contribute to adaptation of immigrants. Among these are factors related to the country of origin (e.g., political and economic situation), migration motivation, degree of difference between culture of origin and host culture, gender, and age at immigration. For example, people who freely choose to move to another country may spend some time learning about the new culture and would be more willing to adopt its values. In contrast, those whose immigration was forced by external factors (e.g., refugees, asylum seekers) may simply move to the first place that opens its doors to them and thus may have very little information on which to build their

expectations about their new life. Indeed, Nguyen and Benet-Martínez (2010) have suggested that refugees may be more likely to resist integration and instead maintain strong ties with their heritage culture. Regarding differences between heritage and host cultures, immigrants from cultures that are similar to the host culture would likely be faced with less culture shock and thus show faster rates of acculturation and cultural stressors that may affect well-being (Berry, 1997). The results of this study also suggest that age is an important stable determinant of both life satisfaction and cultural identity: older immigrants tend to report lower well-being and lower levels of acculturation over time. I should also emphasize that different stable factors may play different roles across individuals. That is, some individuals' life satisfaction and identity may be highly influenced by social support they receive, whereas for others social support may not be a determinant of either of these variables. For example, Yap, Settles, and Pratt-Hyatt (2011) found that support plays a stronger role in the link between cultural identity and life satisfaction for women than for men.

In addition, the bivariate analyses suggested that the influences on the two variables become increasingly common over time, as evidenced by the increasing correlation between the autoregressive components over the years. This suggests that processes that lead to identification with the host culture (and changes in life satisfaction) may change over time. This idea has been virtually unexplored in existing research.

After accounting for the association between life satisfaction and identity at the stable level, there were no effects of life satisfaction (or identity) at one time occasion on identity (or life satisfaction) a year later. Thus, there was no evidence of a directional relationship predicted by the theory of acculturation strategies (Berry, 1997) and the social identity theory (Tajfel &

Turner, 1979) that changes in one variable would lead to changes in the other. Rather, the results suggest that the association between the two variables is a result of common stable influences.

Theoretical implications

The findings from this study have four major implications for the theories of the development of cultural identity (Berry, 1997; Tajfel & Turner, 1979). The first implication concerns the structure of identity. Berry's (1997) theory of acculturation strategies assumes bidimensionality of cultural identity, such that ethnic identity and national identity form two independent dimensions and immigrants may adopt strategies to strengthen or weaken either identity. This study's findings contradict this hypothesis – ratings of identification with Germany and ethnic culture were highly correlated. As immigrants strengthened their identification with Germany, they also distanced themselves from the culture of their country of origin – a pattern that is consistent with the ideas of the social identity theory (Tajfel & Turner, 1979). It is not enough to attribute this finding to the German context and treat is as an exception to the rule. Although Germany indeed does not encourage multiculturalism, Tolley's (2011) report on multiculturalism in developed countries suggests that Germany is not alone in this approach to immigration policy. Many other European countries (Austria, Denmark, France, Italy, Netherlands, Switzerland) have even less tolerant policies regarding multiculturalism. As a point of comparison, the United States scored only 3 points (out of possible 8 – compared to Germany with 2.5 points) on Tolley's multiculturalism index. On the other hand, Canada, whose context likely influenced development of Berry's theory, scored 7.5 points. Thus, independence of cultural and ethnic identity may occur only in certain contexts that nurture multiculturalism. On the other hand, this finding may be specific to the measures used in study. Most existing research has relied on measures that treat cultural identity as a multifaceted construct, and different facets

may show different associations between ethnic and national identities. For example, the most commonly used measure, the Multi-Group Ethic Identity Measure (Phinney, 1992; Roberts et al., 1999) assesses exploration of and commitment to cultural identity, and also includes assessment of culture-related behaviours. Another commonly used scale of ethnic identity, the Multidimensional Inventory of Black Identity (Sellers, Rowley, Chavous, Shelton, & Smith, 1997) measures perceptions of others' evaluations of one's ethnic group. These facets may provide important additional information about immigrants' identities and acculturation, and may show different structure than items that focus on identification with a specific cultural group.

The second implication concerns Berry's (1997) hypothesis that multiple identities have an additive effect on well-being. The reasoning is that identifying with the host culture provides access to resources (e.g., social support, job contacts) from the host culture, identifying with ethnic cultures provides immigrants with resources from their home culture, and more resources are always better. The findings of the present study are inconsistent with this idea. Identification with Germany was positively associated with well-being, whereas identification with ethnic culture was negatively associated with well-being. This suggests that resources provided by the ethnic culture may not contribute to one's well-being. Alternatively, these resources may contribute positively to well-being, but the drawbacks of identifying with ethnic culture in a country in which this is discouraged may overshadow any positive effects of ethnic identity. An important direction for the theory of acculturation strategies will be to identify the conditions in which certain strategies may be more beneficial for the well-being of immigrants than others.

In contrast, the social identity theory (Tajfel & Turner, 1979) predicts that identifying with the more positively evaluated group and distancing from the negatively evaluated group is

beneficial for well-being. Some of the findings of this study are consistent with these predictions. Overall, there was a positive association between identification with Germany and well-being and a negative association between identification with the ethnic culture and well-being. Other findings are also consistent with this theory: for some immigrants it may be more difficult to change group membership from ethnic to German (by identifying less strongly with former and more strongly with latter) – in particular visible minorities (i.e., Turkish immigrants) and older immigrants whose behaviours and value systems may be more strongly tied to the ethnic culture. Consistent with the tenets of the social identity theory, these groups report lower well-being. However, Tajfel and Turner (1979) suggest that these groups may use strategies other than group membership change for maintenance and enhancement of their well-being. In particular, members of these groups may seek to redefine their group in a way to make its evaluation more positive relative to the dominant (i.e., national) group. Some of these strategies may include focusing on desirable attributes of immigrant groups, revaluing certain attributes of immigrant groups so that they're seen a more positive light (e.g., emphasizing beauty of non-dominant skin colour), or comparing themselves to other groups of lower status (e.g., other immigrant groups). Future research should examine the extent to which different immigrant groups may use these strategies and their implications for well-being.

Finally, although some of the findings appear consistent with the social identity theory, analyses that take advantage of the longitudinal nature of these data challenge the idea that it is the changes in group membership that lead to changes in well-being. The bivariate STARTS model provided no evidence that group identification had a prospective effect on future well-being. Another prediction of the social identity theory is that changes in group membership (towards greater identification with the more positively evaluated group) are driven by low levels

of well-being. In contrast with this prediction, I found no evidence that well-being has a prospective effect on future group identification. On the other hand, the association between well-being and cultural identity at the trait level suggests that there are pre-existing differences that are responsible for individual differences in both well-being and the extent to which they adopt the new culture.

In summary, the structure of cultural identity and the direction of the association between cultural identity and well-being were consistent with the social identity theory. However, the findings were inconsistent with social identity theory's proposed process that would lead to the association between these two variables. The results suggest that rather than having a direct effect on each other, cultural identity and well-being likely have a set of common stable determinants.

Strengths and limitations

This was the first study to follow immigrants over many years after settlement into the host country. An important advantage of this study was that the sample of immigrants was approximately representative of the immigrant population in Germany. Previous studies of identity developed tended to focus on the period of adolescence because this period has been known to be important for development of identity. However, as the results of this study indicated, important changes occur in cultural identity of adult immigrants as well. The sample included in the study was diverse in other ways, as it included immigrants from different countries with different motivations for immigration. The longitudinal nature of the data provided an opportunity for unique analyses of stability and change in both mean levels and individual differences in well-being and identity. Moreover, I was able to use fairly novel longitudinal methods to begin to separate and identify different sources on these two variables.

The biggest limitation of using pre-existing data is that I had no control over what variables were included in the study. Measures of identity were far from ideal, and the items that directly asked people about their identity changed over the course of the study. Moreover, the change in variables also coincided with addition of new immigrant samples whose characteristics were different than those of immigrants who had been recruited at an earlier phase of the study. Because of these limitations, it was necessary to use language proficiency as an approximation of cultural identity when making group comparisons. However, my analyses suggested that in the overall sample the same conclusions would be reached regardless of whether I used only the language proficiency variable or the full identity model that included both direct measures of identity and language proficiency. In addition, language proficiency is generally considered to be an appropriate indicator of integration into the host culture because it is important for economic, social, and educational advancement. Thus, there are good reasons to believe that the results of analyses that used language proficiency would hold up if a more direct indicator of national identity was used as an outcome variable. However, it is likely that these measures do not capture the full complexity of the construct of cultural identity, which may include information about the extent of exploration and commitment to the identity, importance of group identification to the self, culture-specific behaviours (e.g., regarding food, clothing), and ethnic composition of one's social network. None of these aspects of identity are perfectly captured in any of the available measures in existing literature, and different studies have focused on different facets. The items used in this study assessed global sense of cultural identity. Different associations with well-being may be obtained if more specific aspects of identity are assessed.

Although the STARTS model is a valuable tool that can separate stable from changing variance components, it is limited in what it can tell us about the sources of this variance. That is,

the model can tell us about relative influence of factors that produce stability and change, but not what these influences are. However, in this paper I have also shown how the STARTS model can be used to help uncover the influences on variables by showing that personality is responsible for some of the stability in both life satisfaction and cultural identity. Future research can use the STARTS model to evaluate other potential factors that may contribute to stability and change in these variables over time (e.g., individual differences that are established prior to immigration vs. differences in post-immigration experiences). Identifying specific sources that lead to stability and change would provide particularly important information about for policy makers and clinicians about the level which programs that are aimed at increasing well-being or integration of immigrants should be targeted. For example, policy makers may wish to know sources of stability in identity so that they can devise pre-immigration programs that would increase integration.

In this paper I have assumed that the correlation between different STARTS model components reflects common determinants. For example, it is an assumption that the trait-level correlation reflects common influence of personality on life satisfaction and identity. However, alternative models that incorporate mediator relationships are possible. That is, personality may have a direct effect on development of identity, and that identity, in turn, may affect well-being. The latter explanation would be consistent with existing theories such as the theory of acculturation strategies; however the present study does not allow for test of specific theoretical models. It is also possible that different processes play a role, and that stable factors have an independent effect on both variables, and also that there is a mediation effect of one or both of the variables.

In this dataset, ethnic and national identities were highly negatively related, contrary to

the theories that posit that maintenance of both aspects of cultural identity is important for well-being. This may be unique to Germany because Germany strongly encourages assimilation and for all practical purpose does not allow for immigrants who maintain strong ethnic identity to flourish. It is an important question how the dynamic between ethnic and national identities and well-being plays out in countries that are more supportive of biculturalism. This also brings up issues of generalizability of the results. Is cultural identity as stable in other host countries as it is in Germany? Are influences on identity similar across different countries? Could we see a more direct effect of identity on well-being in countries that place fewer restrictions on identities of their immigrants? Answers to these questions would shed light on the role that governmental policy plays in shaping identity and well-being of immigrants.

Summary and conclusions

The GSOEP is a unique dataset in that it provides a wealth of data about a large number of immigrants. The longitudinal nature of these data made it possible to address ideas about well-being and cultural identity of immigrants that have been proposed by previous theories but have not been adequately tested. Several important findings emerged. First, change in life satisfaction of immigrants over time mirrored that of general populations. Both trajectories and the extent to which stable and changing factors affect well-being were similar for immigrants and German nationals. Perhaps similar factors influence satisfaction with life of these two groups. It is an interesting question for future research whether life satisfaction of immigrants is improved after immigration (i.e., relative to what it was in their country of origin).

Second, immigrants became more strongly identified with Germany over time with most of identity change occurring in the first decade, suggesting that integration programs may be especially beneficial early on in the acculturation process. Additional support for this claim

comes from the finding that participants from Sample B who, for the most part, came to Germany as temporary workers, identified with Germany less at the beginning but also after they made Germany their permanent home. First years of immigration may be particularly important for identity development, as this is when roles, expectation, and social networks in the new culture are established.

Third, immigrants who reported most growth in identity also reported most positive change in well-being. However, the results of the bivariate STARTS model also suggest that these changes are driven by stable factors that commonly influence both variables. Indeed, contrary to existing theories that explain the link between identity and well-being, once the trait-level association between the two variables was taken into account, there was no additional prospective effect of either variable on the other. On the other hand, personality appears to have a role in the association between identity and well-being. Future research should explore whether personality affects the two variables through common or separate mechanisms, meditational relationships, or some combination of these factors.

Fourth, country of origin, gender, and age at immigration were notable moderators of acculturation. Turkish immigrants' well-being was consistently lower than that of other immigrant groups. I have suggested that this difference may reflect greater discrimination experienced by the more visible ethnic groups. However, other explanations are possible and the reason for this sizeable difference should be addressed in the future. The findings of gender differences in identity development are consistent with the previous theoretical work that has identified women as carries of the culture. Women's identity is slower to shift towards host culture, and it is more influenced by stable factors, which are likely related to the culture of origin. This points to the importance of taking gender into account when developing both

theories of acculturation and interventions designed to help immigrants integrate into new societies. Finally, older immigrants reported lower life satisfaction and identification with Germany, but both of these variables were relatively more influenced by stable factors compared to younger immigrants. Programs aimed at integration may need to develop different strategies for targeting younger and older immigrants.

Immigration affects a sizable proportion of the world's population. Understanding factors that promote adjustment during this period of change is an important goal of psychological research. The present study suggests that there are important moderators of acculturation, but that they affect development of identity and the course of well-being in different ways. It also suggests that there are important pre-immigration factors that affect both identity and well-being. Identifying these variables can provide insights for programs that are aimed at supporting immigrants through the acculturation process.

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