Uniquely Diverse: Ethnic Diversity and Interethnic Contact Predict Individualistic Values and Behaviour

By

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Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners.

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Abstract

Research on social change suggests that cultural values and behaviour have become increasingly individualistic over the past century. Prior researchers theorized that shifts in sociodemographic variables—e.g., changes in urbanization and socioeconomic status, are largely responsible for this cultural change. The research presented in this paper draws from social psychological research to introduce the idea that greater ethnic diversity is related to an increased endorsement of individualistic values and behaviour, and may contribute to the increasing rates of individualism. Across six studies, I investigate the association between the levels of ethnic diversity and individualism across multiple levels of analyses. In Study 1, I demonstrate that historical levels of ethnic diversity across the United States over the last century predict societal indicators of individualism. Study 2 presents evidence that increasing ethnic diversity predicts increasing individualism at the level of U.S. states over the span of 16 years, an effect that exists for both majority and minority group members. In Study 3, I offer evidence that people who perceive greater ethnic diversity in their communities report increased interactions with ethnically different others, and that increased interethnic interactions contribute to a greater endorsement of individualistic values. In Study 4, I present evidence that undergraduate student's perceptions of greater ethnic diversity in a classroom at the start of an academic term predicted a greater endorsement of individualism at the end of that academic term. In Study 5, I show that people who report greater ease of recalling ethnically diverse others in their interpersonal network endorse greater levels of individualism. In Study 6, I present experimental evidence that imagining interacting with ethnically different (vs. same) others increases one's endorsement of individualism. I conclude by discussing the implication of these findings for research on cultural change and intergroup relations.

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Introduction

In recent decades, both ethnic diversity and cultural values of individualism have seen rapid increases across many Western societies. Are these concurrent changes incidental or might these two trends be causally connected? This thesis aims to offer an overview of ethnic diversity's relation to the key cultural dimension of individualism, presenting a systematic and empirical assessment of the endorsement of individualistic cultural values and behaviour as a function of the levels of ethnic diversity within the United States (U.S.) and Canada. Recent population estimates from the U.S. census reveal that ethnic diversity is increasing at an exponential rate, with minority groups currently comprising nearly 40% of the country's population, an increase from 28% in 2010, and 25% in 2000 (U.S. Census Bureau, 2018). Canada has shown a similar pattern to the U.S., averaging roughly 235,000 new immigrants each year since the 1990s, a number resulting in a 21% foreign-born resident population, and 19.1% of the population currently identifying as visible minorities (Statistics Canada, 2018). Although ethnic diversity has been linked to numerous psychological outcomes (e.g., shifts in political ideology, Craig & Richeson, 2014; immigrant attitudes, Schlueter & Scheepers, 2010; community trust, Schmid, Ramiah, & Hewstone, 2014) little research if any, has aimed to understand its impact on sociocultural systems—i.e., the core principles, traditions, and ideals in a society (Heine, 2015). The present research assesses the association between the cultural dimension of individualism and ethnic diversity on multiple levels of analysis, including an examination of large scale historical trends, as well as country and individual levels of analyses.

Over the past century, the prevailing concept of study in cultural psychology has been the cultural dimension of *individualism*—a specific type of social orientation, which entails distinctive patterns of behaviour, motivations, and cognitions. This concept has received the

attention of countless cultural researchers throughout its history (e.g., Greenfield, Keller, Fuligni, & Maynard, 2003; Gelfand, Triandis, & Chan, 1996; Hofstede & Bond, 1984; Nisbett, Peng, Choi, & Norenzayan, 2001; Diener, Oishi, & Lucas, 2003) and has been discussed under several different nomenclatures (e.g., *Gesellschaft*, Tönnies, 1887/1957). One of the most commonly used definitions of individualism classifies the concept as a cultural syndrome (Triandis, 1996), describing it as the central theme of a culture from which interpersonal relations and psychological processes center themselves around. This paper adopts this classification, which portrays the concept of individualism as seeing oneself as an individual within a loosely linked social network of individuals, as opposed to seeing oneself as a collective with close others (e.g., family members)[1].

Notably, this representation of individualism closely aligns with what cultural psychologists refer to as an *independent* social orientation. That is, individuals within individualistic cultures are considered more likely to hold independent representations of the self, seeing themself as unique and separate from others (Markus & Kitayama, 1991; Triandis & Gelfand, 2012). Although conceptually distinct, independent social orientation and individualism are often discussed synonymously in research (Cross, Hardin, & Gercek-Swing, 2011). Due to the terms individualism and independent social orientation being subject to a great degree of overlap in the cultural psychological literature (see Brewer & Chen, 2007 for discussion), the

[1] The latter portion of the definition may be considered a reflection of a collectivistic form of cultural orientation. Although on the societal level, individualism and collectivism may represent opposing elements of the same dimension (e.g., Na et al., 2010), on the level of a person they are theoretically distinctive representations that can co-exist within the same individual (Gelfand et al., 1996; Coon & Kemmelmeier, 2001; Triandis, Leung, Villareal, & Clack, 1985). This dissertation focuses on the concept of individualism as separate from collectivism, acknowledging however, that both individualism and collectivism constitute related social patterns.

terms individualism and independent social orientation in this dissertation will both be used to refer to the overarching notion of individualism as a cultural syndrome.

In the cultural psychology research literature, individualism is often conceptualized by how one represents the self relative to others in their social network. Specifically, a high level of individualism is represented by individuals seeing their *self* as distinct from others, as well as maintaining a social network with relatively permeable ingroup/outgroup boundaries. What this latter notion entails is that in contexts of higher individualism, transitions between the ingroup and outgroup for those within an individual's social network are more readily possible (Markus & Kitayama, 1991). This individualistic representation of the self is known to predict a number of motivational, cognitive, and behavioural outcomes. Specifically, previous empirical work suggests that people in an individualistic (vs. collectivistic) cultural system are more likely to emphasize their own thoughts, feelings, and goals (Markus & Kitayama, 2010), seek out choice and uniqueness (e.g., Snibbe & Markus, 2005), and show a stronger positive correlation between personal achievement and happiness (Kitayama, Park, Sevincer, Karasawa, & Uskul, 2009). What these findings suggest is that individualism is represented by psychological tendencies and preferences to see oneself as being unique, increasing the importance of personal achievement for determining the value of one's self-identity (Oyserman, Coon, & Kemmelmeier, 2002). Provided that individualism entails a distinctive view of the self within a loosely linked social network, it is possible that experiences with others in one's social network can influence the ideals and principles people uphold (i.e., their cultural values), as well as how they come to represent their self-identity. Because the nature of ethnic diversity is tied to the social relationships people have, it is possible that ethnic diversity can shift cultural values toward or away from individualism, and consequently, the types of motivations and behavioural outcomes

that individualism tends to predict. This next section reviews research findings on the implications of ethnic diversity in social relationships, discussing how ethnic diversity can potentially impact individualism.

How Ethnic Diversity can Shape Individualism

Theoretical models on the consequences of ethnic diversity suggest that the presence, or lack of ethnic diversity in one's environment can shape the nature of what comprises individualistic values and behaviour—i.e., the structure of a person's interpersonal relations and their psychological processes. For instance, researchers find that greater exposure to ethnically different others is associated with one's level of interethnic anxiety and prejudicial attitudes, and has an impact on their social behaviour, such as their tendencies for involvement in their community (e.g., Putnam, 2007; Pettigrew & Tropp, 2008). In addition to shaping interpersonal relations through changes in individual attitudes and behaviour, exposure and interaction with ethnically different others is also likely to have an impact on one's self-identity. Ethnic diversity provides the opportunity for people to interact with others who are more likely to come from different types of social backgrounds, perspectives, and uphold different values. Consequently, exposure to ethnically diverse others opens up the opportunity for people to see themselves as distinctive from others in one's community, which may contribute to people developing or perhaps emphasizing a personalized and individuated self-identity.

In line with this idea, Oishi (2010) suggests that individuals who are more residentially mobile are more likely to expose themselves to different people and have looser social networks. Consequently, Oishi argues that the more people move in their lives, the more they tend to develop an individualistic self-representation. These claims stem from research suggesting that residentially mobile individuals have a greater tendency to form "duty-free" interpersonal

relationships (Oishi, Lun, & Sherman, 2007). Arguably, the social networks of residentially mobile people are more likely to be comprised of those with differing values, beliefs and opinions than oneself—a type of experience that is more common when interacting with ethnically different others. If that is the case, research findings on mobility suggest that on the individual-level, those with increased exposure to others with different experiences and backgrounds may be more likely to develop a greater individualistic self-representation.

Beyond the individual-level, research at the community level also suggests that higher levels of ethnic diversity may result in greater individualism. Research suggests that increased levels of ethnic diversity in a community can result in a greater competition for resources among different groups, triggering greater feelings of intergroup threat and anxiety (Stephan, Stephan, & Gudykunst, 1999). In the presence of such competition, scholars in sociology argue that greater ethnic diversity can contribute to greater rates of social isolation, citing evidence that areas of high ethnic diversity are associated with people having fewer close friends and confidants, spending more time at home watching television, and less involvement with their communities (Putnam, 2007). These findings suggest that at the broad community-level, ethnic diversity can have implications on community structures, such that highly diverse areas are more likely to have interpersonal structures in place that would reflect a more individualistic, independent lifestyle—e.g., higher rates of living alone and smaller family sizes (Grossmann & Varnum, 2015).

Together, these previously discussed research findings suggest that greater interethnic contact and exposure to ethnically diverse others can have meaningful ramifications for the types of attitudes people hold and the behaviours they enact. At an individual level, increased interethnic interaction exposes people to new ideas, connections, and friendships, providing

people with the means to situate themselves as unique individuals within a diverse social network. At the community-level, such exposure may result in people being more likely to withdraw from their environments, leading to individualistic interpersonal structures in the community. While these outcomes suggest that ethnic diversity may contribute to greater individualism, further insight from some of the key social psychological theories provide more specific mechanisms for how exposure to greater ethnic diversity can shape individualism.

***Interethnic Contact between Individuals*.** One of the most recognized social psychological theories related to interethnic relations is *contact theory* (Allport, 1954; Pettigrew, 1998). Much of the research on contact theory examines interethnic interactions between individuals, suggesting that increased contact with people from different groups results in lower prejudicial attitudes and lower interethnic anxiety toward those groups (Dovidio, Gaertner, & Kawakami, 2003; Pettigrew & Tropp, 2008). Theoretical models pertaining to contact theory suggest that one's experiences with others from different groups can shape one's self-identity. For example, the common ingroup identity model (Gaertner, Dovidio, Anastasio, Bachman, & Rust, 1993) suggests that one of the consequences of interethnic contact is *de-categorization*, where exposure to different groups can encourage people to represent themselves as separate individuals from others. The common ingroup identity model also proposes that one of the other consequences of interethnic contact may be *re-categorization*, encouraging people to revise their ingroup identity to include others. Notably, both of these outcomes of interethnic contact in this model is associated with greater individualism because lowered ingroup boundaries, as well as seeing oneself as separate from others are considered individualistic self-representations (Oyserman et al., 2002; Markus & Kitayama, 2010).

Additional theoretical models in the intergroup relations literature also suggest that

interethnic contact can lead to greater individualism. Specifically, because people are motivated to see themselves positively, researchers suggest that interethnic situations can trigger a consideration of one's social identity by providing a setting wherein people can situate their individual place and social standing relative to others (Tajfel & Turner, 1979). This suggests that interethnic interactions offer a social comparison context where people may be more motivated to distinguish themselves and focus on personal achievement to demonstrate their value relative to others—both of which are related facets of individualism. The tendency to individuate oneself from others in the presence of ethnic diversity is additionally supported in related theories that stem from contact theory. For example, according to the deprovincialization hypothesis (Verkuyten, 2004), interethnic contact encourages people to take a less provincial perspective on outgroup members—i.e., recognizing that their values, experiences, and beliefs may not align with those from different groups. As a result, people learn to individuate themselves from others during interethnic contact. Specifically, researchers investigating the deprovincial hypothesis found that students in classes with greater ethnic diversity tended to report lower identification with their particular ethnic ingroup (Verkuyten, Thijs, & Bekhuis, 2010). This finding provides further evidence that ethnic diversity can influence individualism by weakening the boundaries between the ingroup and outgroup—a critical feature of the independent social orientation (e.g., Heine, 2015). Overall, research findings pertaining to contact theory suggest that because ethnic diversity can contribute to greater interethnic contact, it creates an opportunity for people to recognize others' unique backgrounds, and position people to view themselves as unique individuals among an array of others from differing backgrounds and perspectives.

Interethnic Conflict in the Community. In a related, but differing perspective from contact theory, *conflict theory* posits that generally, ethnic diversity results in greater tension and

conflict over resources, which consequently tends to encourage greater social isolation and reduced social cohesion (Putnam, 2007). Much of this research is of large interest to sociologists, whose research moves from looking at ethnic diversity at the individual-level, toward a broader focus on its effects at the community level. Specifically, sociologists argue that high ethnic diversity in a community or neighbourhood tends to be associated with greater out-group distrust and lower generalized trust, triggering a tendency for people to "hunker down" and withdraw from their communities (Putnam, 2007, see also Putnam, 2001). To support these claims, Putnam (2007) cites evidence that neighbourhoods with high levels of ethnic diversity is associated with lower levels of altruism, smaller social networks, and less volunteering. Notably, the finding that ethnic diversity is associated with lower trust, lower social cohesion, and a tendency to isolate oneself is debated in the sociology literature (e.g., Lancee & Dronkers, 2008; Sturgis, Brunton-Smith, Kuha, & Jackson, 2014; Nai, Narayanan, Hernandez, & Savani, 2018). However, if ethnic diversity is indeed associated with withdrawal forms of behaviour as purported by conflict theory, greater levels of ethnic diversity is likely to be associated with societal behaviour that cultural psychologists consider reflections of individualism.

Within the cultural psychology literature, behavioural correlates of individualism are mirrored in interpersonal structures that involve social isolation, including measures such as the rate of adults living alone, smaller family sizes, and greater divorce rates (Grossmann & Varnum, 2015; Ogihara & Uchida, 2014). In line with conflict theory, other theoretical models such as *Integrated Threat Theory* (ITT; Stephan & Stephan, 2013) proposes that these individualistic-related measures are likely to arise in response to increased threat from ethnic diversity. According to ITT, the presence of ethnic diversity can bring threats to a majority group member's ingroup status (realistic threat) and threats to their morals, values, beliefs, and attitudes

(symbolic threat). These threats can result in prejudicial attitudes toward outgroups members, lower in-group identification, and suggest a greater likelihood of people distancing themselves from a community where ethnically different others are perceived to be prevalent (Stephan, Diaz-Loving, & Duran, 2000; Stephan & Stephan, 1985; but see Branscombe & Wann, 1994).

Researchers also recently investigated how perceptions of increasing diversity in the community may be perceived as threatening to majority group members. For example, researchers found that after White Americans were informed of an increasing ethnic minority population in the U.S., they tended to report greater explicit and implicit racial prejudice, relative to those not presented with this information (Craig & Richeson, 2014a, 2014b). This increase in prejudicial attitudes was statistically accounted for by increased perceptions of threat to White's social status. These researchers suggest that increasing racial divide generates a preference for greater isolation from outgroup members, and withdrawal from neighbourhoods (i.e., "White Flight", Zou & Cheryan, in prep; see also Craig, Rucker, & Richeson, 2017). Consequently, these findings suggest that conflict triggered by ethnic diversity can result in greater withdrawal behaviour, changing people's social networks and encouraging individual autonomy.

Whether at the intergroup or interpersonal level, conflict theory—along with contact theory—appears to suggest that ethnic diversity may promote greater individualism. Conflict theory, from which findings tend to come from the research at the broader community level, suggests that exposure to ethnic diversity may encourage people to hunker down and focus on their own personal livelihood. These outcomes may be captured in broader societal reflections of individualism, such as a society's interpersonal structure and livelihood (e.g., household size, Grossmann & Varnum, 2015). At an individual level however, ethnic diversity may be contributing to greater individualism through greater interethnic interactions, providing

opportunities for people to individuate themselves from others in their social network. Given the potential association between ethnic diversity levels and individualism, one might anticipate that the rising rates of ethnic diversity would correspond with rising rates of individualism in society. In the following section, I overview research in the cultural change literature suggesting that individualism has indeed been concurrently rising.

Cultural Change and Rising Individualism

Over the past decades, researchers in cultural psychology have been increasingly interested in how social change is shaping culture (Greenfield, 2016; Kashima et al., 2009; Oishi, Kesebir, & Diener, 2011). Theories thus far postulate that societal changes like the industrial revolution, as well as human developmental advances in technology, communication, formal education, and increased wealth are among several factors that are driving an increase in a cultural emphasis on personal goals and autonomy, and a preference for uniqueness—psychological manifestations of individualism (Greenfield, 2009). Researchers argue that as a result, societal pressures are shifting toward greater individual rights, fostering advances in affirmative movements such as gender equality (e.g., Norris & Inglehart 2009; Varnum & Grossmann, 2016), but also having consequences on vanity, such as increased levels of narcissism and the prioritization of fame (Cai, Kwan & Sedikides, 2012; Uhls & Greenfield, 2012).

Early research on this cultural change stems from attempts to understand the psychological consequences of modernization (Inkeles, 1975, 1983), with researchers showing that growing levels of modernization—for example, increased industrialization, urbanization, and bureaucratization, jumpstarted a series of changes that contributed to increasing levels of individualism. Scholars theorized that as developing countries participated in a more modern

economy, more factories were built in urban areas, causing a movement of workforces into urban sprawls. This movement triggered an increased affordance for individual autonomy, allowing people to manage their own personal income, live in their own spaces, have smaller households, and increase their means of autonomous decision making (Sachs, 2005; Newson, Postmes, Lea, & Webley, 2005). Although intuitively compelling as reasons for why individualism has been rising, scholars proposed several limitations to modernization alone as a predictor of increasing rates of individualistic behaviour. Namely, researchers called into question its directional causality, as well as its explanatory power with respect to highly developed East Asian countries with low rates of individualism (see Hamamura, 2012; Inglehart & Baker, 2000; Park, Twenge, & Greenfield, 2014). With uncertainty behind why individualism has been rising, researchers recently endeavoured to investigate whether individualism was in fact rising, and attempted to isolate the differential effects of sociodemographic variables in predicting rates of individualistic cultural practices and behaviour.

Numerous cultural researchers have now focused their work on identifying and understanding the increasing rates of individualism (Twenge, Campbell, Hoffman, & Lance, 2010; Twenge, Honeycutt, Prislin, & Sherman, 2016; see Varnum & Grossmann, 2017 for an overview) with a particular interest in uncovering the underlying societal factors responsible for this cultural change. Greenfield (2013) for example, capitalized on the recent availability of the Google Books Ngram database (Mishel, 2013) to investigate the publication of individualistic words in published books and its relation to shifts in urbanization across the U.S. and the United Kingdom. Greenfield utilized the data she observed to argue that movement from rural populations to urban populations from the years 1800-2000 aligned well with increasing individualistic words in published books (e.g., individual, self, unique), arguing that increasing

rates of urbanization are in part responsible for increasing rates of individualism over time. Following this work, Grossmann and Varnum (2015) traced individualistic trends in the U.S. across the 20th century as represented by published individualistic words, unique naming practices, and individualistic interpersonal structure (e.g., smaller family sizes, proportion of adults living alone). Grossmann and Varnum tested these trends in relation to shifts in five socio-ecological factors: prevalence of infectious diseases, disaster prevalence, urbanization, secularism rates, and socioeconomic status. The researchers determined that individualism across the U.S. has been increasing over time, concluding that from the five socio-ecological factors assessed, socioeconomic status emerged as the most robust predictor of the increasing rates of individualism.

Beyond a North American context, research on other cultures suggest that rising individualism is a relatively global phenomenon. For example, Hamamura (2012) found that the same individualistic interpersonal structures increasing in Western countries (e.g., increased divorce rates, smaller family sizes) have historically also been changing in the same direction in Japan. These changes in interpersonal structure in Japan was further supported in work by Ogihara (in press, see also Ogihara et al., 2015) who observed these changes from 1947-2015 and demonstrated in the same time frame, there has been an increase in the usage of individualistic words in Japanese newspapers, as well as an increase in the uniqueness of names for children and pets. In support of rising individualism as a global phenomenon, Santos, Varnum, and Grossmann (2017) recently examined 78 countries across the span of 51 years, finding that a majority of those countries demonstrated a substantial increase in individualistic practices (e.g., living alone) and individualistic values (e.g., the value of teaching independence to children, increased preference for self-expression). Santos and colleagues argued that changes

in socioeconomic development, assessed through white collar jobs, occupational prestige, educational attainment, and income, was the most robust predictor of these changes compared to other socioecological factors—e.g., disaster and pathogen prevalence.

Together, the past decade of research on cultural change demonstrates that individualism has indeed been on the rise. It is change that is occurring globally, and it manifests itself through multiple forms in terms of societal practices and cultural values. Less certain however, are the socioecological factors driving this change. Early capitalist and modernization theories suggested that individualistic forms of behaviour were rising due to increased levels of modernization (Inkeles, 1975; Sachs, 2005). Greenfield (2013, 2015) argued for the role of urbanization in predicting this cultural change, whereas others argued that socioeconomic status predicts greater individualism (Grossmann & Varnum, 2015; Kraus, Piff, Mendoza-Denton, Rheinschmidt, & Keltner, 2012; Piff, 2014; Santos et al., 2017). While there has been converging evidence for the historically rising rates of individualism across a wide range of researchers, there still remains a large interest in trying to understand why such values shifted the way they have. Given the corresponding historically rising ethnic diversity, and the theoretical reasons for why exposure to ethnic diversity may impact individualism, it is conceivable that shifts in ethnic diversity may be predicting these changes over time. The present research aims to investigate the validity of such a claim, assessing whether the historically concurrent rising rates of ethnic diversity and individualism are merely incidental, or meaningfully interrelated.

Present Research

The present studies test whether ethnic diversity is related to individualism at the country-level, as well as the individual level. Drawing from research in the social psychological and sociology literatures, I hypothesized that increased levels of ethnic diversity would be

associated with greater rates of individualistic interpersonal livelihood and individualistic cultural practices. Moreover, I hypothesized that reports of greater ethnic diversity in one's environment will be positively associated with the endorsement of individualism (e.g., independent self-construal), an effect that should be statistically accounted for by greater interethnic contact.

In six studies in this dissertation, I test my hypothesis that greater ethnic diversity is positively associated with individualistic cultural values and behaviour. The studies aimed to provide supporting evidence that ethnic diversity contributes to a greater endorsement of individualism, as well as discuss and offer preliminary evidence of the consequences of such a shift in values. In Study 1, I adopt previous methodology form researchers assessing cultural change, utilizing publicly available large datasets to collect data on trends in individualistic interpersonal structure and cultural practices over time in the U.S. (from 1950-2016). Using this information, I examine its relation to corresponding historical trends in the levels of ethnic diversity across the country. In Study 2, I move to a more fine-grained level of assessment, examining the association between ethnic diversity and individualistic behaviour within each U.S. State from 2000-2016, assessing its relationship separately for majority and minority group members. Following the assessment of ethnic diversity and individualism at the country-level, Study 3 moves to the assessment of the effects of ethnic diversity on individualism at the individual-level, utilizing correlational methods to provide evidence that subjective perceptions of ethnic diversity in one's environment is related to greater interethnic contact, which in turn is associated with an increased endorsement of individualism. Using two waves of data, Study 4 investigates whether greater perceptions of ethnic diversity in an undergraduate academic course at the start of an academic term predicts a greater endorsement of individualism at the end of the

academic term. Study 5 utilizes an experimental design to test whether the salience of ethnically different others in one's social network is associated with a greater endorsement of individualism, and Study 6 tests whether imagined contact with those from a different ethnic background, relative to those from the same ethnic background, results in a greater endorsement of individualism. Throughout the six studies, I test whether the effects of ethnic diversity on individualism may differ for majority and minority group members (Study 2; Study 3 vs. Studies 4-6), investigate the role of interethnic contact and interethnic anxiety (Studies 3-6), and present preliminary evidence for the consequences of increasing individualism on reports of subjective well-being (Study 4) and open-mindedness (Studies 5-6).

Study 1

In Study 1, I sought to explore the association between ethnic diversity and individualism at the country-level, assessing shifts in societal levels of ethnic diversity in relation to societal indices of individualistic behaviour from the years 1950-2016 in the United States. Study 1 adopts the framework developed by prior researchers to assess social change and the socioecological correlates of individualism (e.g., Varnum & Grossmann, 2017; Greenfield, 2016; Ogihara et al., 2015). Specifically, I examined how shifts in the rates of ethnic diversity across time are associated with shifts in the behavioural correlates of individualism used in prior research. In doing so, I aimed to test my hypothesis that the levels of ethnic diversity across the U.S. over the past half century have been positively associated with a greater likelihood of individualistic societal behaviour.

Method

Procedure. Study 1 traces the association between the levels of ethnic diversity and individualistic behaviour in the U.S. over the past half century. This methodology closely

follows that of previous research (Grossmann & Varnum, 2015), which assessed numerous sociodemographic predictors of cultural change over time. Due to limitations in survey design and availability of data on ethnic diversity, Study 1 focuses on analyzing data from the years 1950-2016[2]. Data collection for these years was obtained through large-scale publicly available databases and included indices of individualistic behaviour and levels of ethnic diversity.

Indices of Individualism. To assess country-level measures of individualism, I obtained measures that reflect two components of individualistic behavior: Individualistic interpersonal structure and cultural practices in naming children.

Individualistic Interpersonal Structure. Prior cultural researchers argue that interpersonal structure in society—e.g., the strength of family ties and social network structures, can reflect the society's level of individualistic cultural behaviour (Markus & Kitayama, 1991; Triandis, 1995; Hamamura, 2012). Thus, one of the indicators of country-level individualism was derived from the way people structure their interpersonal livelihood, such as the size of their family households and their marital choices. Drawing from publicly available datasets from 1950-2016, measurements were extracted for individual-level and household-level variables representing individualistic behaviour.

I obtained three individual-level variables through the data archive of the Integrated Public Use Microdata Series USA (IPUMS). The IPUMS collectively integrates U.S. census data from 1850-2000, and the American Community Surveys from the year 2000 onward (Ruggles et al., 2017). Data from the U.S. census were collected on a decennial basis—i.e., every 10 years,

[2] Population level demographics on ethnic groups were limited in the U.S. census prior to 1950, when the U.S. census first introduced an "other race" category option (Gibson & Jung, 2002). Due to ethnic group categories from the U.S. census being a primary method of assessing country-level ethnic diversity, only data from 1950 onward were analyzed for Study 1.

up until the year 2000 where data from the American Community Surveys were available for each year through 2016. IPUMS data are categorized as microdata—as opposed to aggregate data—with weighted samples that allow for the computation of representative population distributions of data across the United States. I utilized the weighted sample information to compute person-level variable data from 1950-2016. First, I computed a proportion measure of single-child to multi-child homes. Second, I computed a measure of the average family size. Third, I obtained a measure of the proportion of adults (18 years and older) living alone—i.e., living without other family members in the household. In addition to these variables, I also drew from data provided by the Center for Disease and Control Prevention ("Marriage and Divorce", 2018) and computed a proportion of the rates of divorce (including annulments) to marriage over the same time period. Single-child households, *smaller* family sizes, living alone, as well as higher divorce rates were all previously used as indicators of individualism (Grossmann & Varnum, 2015) and theoretically discussed as a reflection of individualistic interpersonal structure (Triandis, 1996; Hamamura, 2012).

At the household-level, I also utilized the IPUMS dataset to compute the proportion score of three-generation to single-generation households from 1950-2016. Multi-generation households are considered a representation of filial piety—i.e., respect for elders and ancestors, and is tied to lower individualistic behaviour (Triandis, 1995, 1996). Using all five obtained measures of individualistic interpersonal structure, I computed a composite measure of interpersonal structure by reverse coding the interpersonal structure measures that reflected lower individualistic behaviour (i.e., average family size and multi-to-single generation households). The resulting scores hung together well ($\alpha = .77$), and thus I standardized each measure and averaged their scores, such that higher scores reflect a greater individualistic

interpersonal structure (*Skew* = -2.14, *Kurtosis* = 3.37). Analyses reported in Study 1 include both a combined composite measure of individualistic interpersonal structure, as well as the individual measures within the averaged measure.

Cultural Practices. In addition to the manifestation of individualism in interpersonal structure, individualism can also be captured through cultural practices (Chiu & Hong, 2006; Morling, Kitayama, & Miyamoto, 2002). To assess individualism in this domain, I focus on one cultural practice previously used as a reflection of individualism: distinctive naming practices for babies[3]. Prior research argues that making unique choices is a key feature of independence and individualism (Kim & Markus, 1999; Hazel Rose Markus & Schwartz, 2010; Savani, Markus, & Conner, 2008). Thus, prior research conceptualized distinctive naming practices as a cultural marker of individualism, arguing that distinctive baby names reflect a preference for uniqueness in society (Varnum & Kitayama, 2011). Accordingly, as a measure of distinctive naming practices, I obtained data through the Social Security Administration which collected data on the frequency of baby names (with a minimum of five occurrences) throughout the U.S. since 1880 ("Beyond the Top 1000 Names", 2018). Following prior research (Grossmann & Varnum, 2015), which utilized the available data from the U.S. Social Security Administration on the top 20 most popular baby names, I operationalized the preference for distinctive baby names by computing the proportion of babies receiving the 20 most popular baby names for each gender from 1950-2016. For each gender, a distinctiveness index was computed by subtracting one from the

[3] Notably, ethnic diversity and distinct naming practices are likely to have high overlap due to ethnic groups increasing the presence of more unique names in the population. Although this limits the interpretation of unique naming practices as an indicator of individualism, it was retained for the purposes of consistency with prior researchers that labeled this as a valid measure of individualistic practices. For further discussion, see the limitations and future directions subsection in the general discussion of this dissertation.

proportion score, such that higher scores reflected a greater preference for distinctive baby names. Distinctive naming practices for both genders were nearly perfectly correlated (r = .98), and thus I standardized the measure for both genders and averaged them together (*Skew* = -1.59, *Kurtosis* = 1.50).

Ethnic Diversity. To compute a measure of ethnic diversity, I employed the ethnic fractionalization (EF) index (Alesina, Devleeschauwer, Easterly, & Kurlat, 2003; Montalvo & Reynal-querol, 2005). The measure of ethnic fractionalization utilizes the following formula to operationalize ethnic diversity:

$$\boldsymbol{EF} = \sum_{\boldsymbol{i=1}}^{\boldsymbol{N}} \boldsymbol{\pi_{\mathrm{i}}}\,(\mathbf{1} - \boldsymbol{\pi_{\mathrm{i}}})$$

Where π_{i} represents the proportion of people who belong to an ethnic group *i*, and *N* is the number of groups. The final computed score ranges from 0 to 1, and is interpreted as the probability that two randomly selected individuals within a sample population will *not* belong to the same ethnic group. Thus, higher scores are interpreted to reflect a greater degree of ethnic diversity.

This measure of ethnic diversity is used in the economic, psychological, and sociological literatures to understand numerous social science phenomena (e.g., changes in labour markets, Barr & Oduro, 2002; resource distribution; Hodler, 2006; social conflict; Esteban & Ray, 2011). Although there are numerous other ways to conceptualize ethnic diversity (e.g., linguistic distinctions, Easterly & Levine, 1997; ethnic polarization; Alesina, Michalopoulos, & Papaioannou, 2016), I focus on EF as an index of ethnic diversity because it offers a direct representation of the conceptualization of ethnic diversity in this paper. Namely, its measure reflects the degree to which a population is distributed into different ethnic groups, such that a

greater number of groups and more even distributions across different ethnic groups reflect greater ethnic diversity. Drawing from the U.S. census data available in the IPUMS, I gathered information on the overall proportions of ethnic group categories of the U.S. The categories available in the dataset were: i. White; ii. Black/African American; iii. American Indian; iv. Chinese; v. Japanese, vi. Other Asian or Pacific Islander; vii. Other race; viii. Two major races; ix. Three or more major races[4]. With this information, I applied the formula of computing EF to obtain a measure of ethnic diversity for each available year from 1950-2016 (*M* = .35; *SD* = .06; *Kurtosis* = .49; *Skew*: -1.30).

Study 1 Results

I performed analyses using both SPSS version 25.0, and the *R* language for statistical computing (R Development Core Team, 2014). Due to the nature of the data collected—i.e., time-series data—multiple approaches to assessing the association between predictors of cultural markers of individualism were employed. Research in the social sciences suggest multiple approaches to analyzing time-series data, without a clear consensus in terms of the best methods for assessing the relationships between variables over time (Box-Steffensmeier, Freeman, Hitt, & Pevehouse, 2014). Following recommendations for best practices in social psychology (Aronson, Ellsworth, Carlsmith, & Gonzales, 1990), my analytic approach involved multiple methods of assessing the association between ethnic diversity and markers of individualism, examining any convergence of findings across the multiple methods. Consequently, the presented results for Study 1 begin with information on zero-order correlations between ethnic diversity and markers of individualism, as well as their association when the collected data are detrended—i.e., removing the shared influence of time on variables. I used ordinal-level Kendall's τ, which is

[4]The latter two categories were only available beginning from the 2000 census data.

typically used for time-series analyses and is not influenced by possible skew in the data. Subsequently, I present results involving cross-correlations and lagged analyses. Finally, I follow these previous results with analytic approaches considering concerns of autocorrelation in the data—i.e., the association between a signal and itself at an earlier time point.

Associations between Ethnic Diversity and Individualism. Measures of interpersonal structure and distinctive naming practices were related in the expected direction. Table 1 presents the association between each measure of individualism within the interpersonal structure and cultural practice measures. As shown in the Table, neither the divorce-to-marriage ratio nor three-to-first generation household ratio were significantly related to any of the other individualism indicators |*r*s| = .06-.24.

Table 1
Zero-order correlations between cultural indicators (Study 1)

Cultural indicators	1	2	3	4	5	6	7
Interpersonal structure							
1. Divorce/marriage ratio	—	.14	.11	-.11	-24	.15	.17
2. Adults living alone		—	-.72***	.67***	.10	.71***	.67***
3. Average family size			—	-.67***	-.06	-.73***	-.71***
4. Single/multi-child families				—	-.26	.82***	.78***
5. 3rd/1st-gen households					—	.16	.15
Cultural practices							
6. Distinct naming: boys						—	.96***
7. Distinct naming: girls							—

Note. Correlation reported reflect the ordinal-level Kendall's τ coefficient. Higher scores on variables reflect greater individualism, with the exception of the average family size and 3rd/1st generation household variables, in which lower scores are considered reflections of greater individualism. All *n*s = 22.
*** $p<.001$

Detrending Analyses. To assess the association between ethnic diversity, SES, and markers of individualism, I first detrended (i.e., removed the long-term trend in time series data)

for each of the individual measures. Without detrending in time-series data, spurious correlations can emerge despite the lack of an underlying association (Koplenig & Müller-Spitzer, 2016). Thus, the process of detrending the data is often a recommended practice for analyzing time-series data (Jebb, Tay, Wang, & Huang, 2015) and is regularly the first step in time-series analyses (e.g., Tiokhin & Hruschka, 2017). There are several proposed methods used for detrending data (see Hynman & Athanasopoulos, 2014 for example), without a clear consensus on what methodology is preferred. For that reason, I elected to employ two methods that take different approaches to detrend data: first-order detrending and best-fit line detrending. First-order detrending involves removing first-order autocorrelations by computing the difference score between each year. This process entailed standardizing each measure, computing the absolute value of each score for each year, and computing a difference score between each time point and the previous time point (*Skew* = -1.50, *Kurtosis* = 2.09). Resulting analyses for the first-order detrending method is an analysis of the *change* in time between years within each variable. The second method I used was best-fit line detrending, which involved computing the least-squares fit of a linear trend in the data, and subtracting that resulting function from the data (*Skew* = .569, *Kurtosis* = 2.02). This process was completed using the 'pracma' R package, and the detrend function for each variable of interest. As depicted in Panel A of Figure 1, measures of ethnic diversity showed an increasing rate over time. Panels B and C show the resulting measure following the corresponding detrending procedures[5].

[5] The year 2000 was the first year that the U.S. census allowed individuals to identify with more than one race (Lee, 2001). This change resulted in the highest year of ethnic diversity in the data, and should be cautiously considered. Despite this idiosyncrasy, because the measure still reflects overall self-reported ethnic diversity of the population, this data point was retained in the primary analyses. The relationships between ethnic diversity and indices of individualism were similar with and without the year 2000 present in the data (First-order detrend: $\tau_{AvgInterpersonal}$ = .53, $\tau_{AvgUniqueNames}$ = .10; Best-fit line detrend: $\tau_{AvgInterpersonal}$ = .70, $\tau_{AvgUniqueNames}$ = .75)

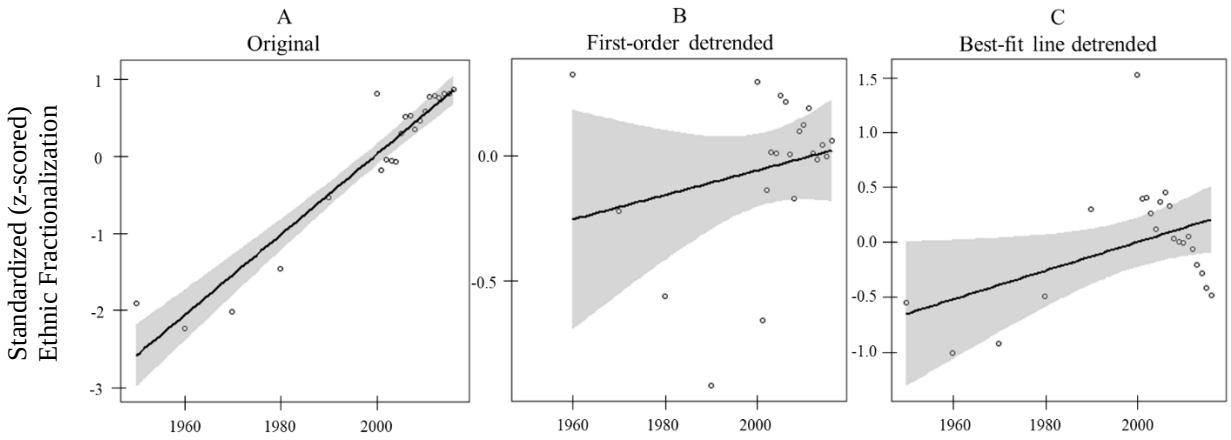

Figure 1. Scatterplots of the ethnic diversity in the U.S. (y-axis) as a function of years 1950-2016 (x-axis) when not detrended (Panel A), detrended by removing first-order differences (Panel B), and detrended by removing the least squares fit from the original data (Panel C).

The original ethnic diversity measure moderately related to the first-order detrend scores, r = .33, as well as the best-fit line detrend scores, r = .54. The two detrended scores did not show a relationship to one another, r = .05. Table 2 below presents the correlations between ethnic diversity and the markers of individualism for both the original non-detrended measure, as well as the detrended measures.

Table 2
Correlations between non-detrended and detrended measures of individualism and ethnic diversity

Cultural indicators	Non-detrended	First-order detrended	Best-fit line detrended
Interpersonal structure			
1. Divorce/marriage ratio	.18	.28	.56
2. Adults living alone	.60	.19	.48
3. Smaller family size	.70	.47	.78
4. Single/multi-child families	.64	.12	.64
5. 3rd/1st-gen households	.17	-.08	-.58
Averaged measure:	.58	.55	.71
Cultural practices			
6. Distinct naming: boys	.77	-.01	.79
7. Distinct naming: girls	.76	-.20	.72
Averaged measure:	.76	-.08	.78

Note. Correlations represent the Kendall's τ coefficient. Original and best-fit line detrended variable's n = 22; First-order detrended variable's n = 21.

As presented in Table 2, without detrending the data, greater levels of ethnic diversity over time was associated with a greater proportion of divorce, adults living alone, smaller family sizes, and a greater proportion of single-to-multiple child families—all indicators of greater individualism. Ethnic diversity however, was positively associated with the third-to-first generation households, which is theoretically linked to lower levels of individualism. Greater ethnic diversity was associated with a greater preference for distinctive names of both boys and girls. Overall, ethnic diversity was positively related to the averaged composite scores for both individualistic interpersonal structure, $\tau = .58$, and distinctive naming practices, $\tau = .76$,

When detrending the data through a first-order detrending method, ethnic diversity maintained its associations in the same directions as the non-detrended measure for each of the interpersonal structure measures. However, the relationship between ethnic diversity and three-to-one generation households became negative. The association between ethnic diversity and the averaged measure of individualistic interpersonal structure was similar to the association of the non-detrended measure, $\tau = .55$. With first-order detrending, ethnic diversity no longer was associated with a preference for distinctive baby names. Using the best-fit detrending method, results were consistent with the non-detrended associations in direction for all variables except the third-to-first generation households, which became negatively related. Overall, the best-fit detrended scores were positively related to the averaged individualistic interpersonal structure score, measure $\tau = .71$, as well as the averaged naming practices measure, $\tau = .78$. Overall, the general results across the detrended measures suggest that even when detrended, there was a meaningful association between ethnic diversity and individualistic interpersonal structure and practices.

Cross-Correlations and Lagged Analyses. In addition to assessing the stationary

associations between ethnic diversity and individualism indicators, one can also employ lagged and cross-correlation analyses to interpret time-series data. Cross-correlations assesses the association between two signals occurring in parallel, representing the association as a function of displacing one relative to the other. That is, they represent how past measures of a variable *x* are correlated with present and future levels of variable *y*. Following prior research on assessing cultural change (e.g., Grossmann & Varnum, 2015), I lagged measures of ethnic diversity in order to assess the association between past levels of ethnic diversity and future levels of individualism. Figure 2 presents the lagged ethnic diversity predictors, as a function of the composite measures of interpersonal structure and naming practices. The results pertain to the original variables—as opposed to detrended variables—because the model the data is being fit on is expected to be linear, for which information is lost in detrended variables.

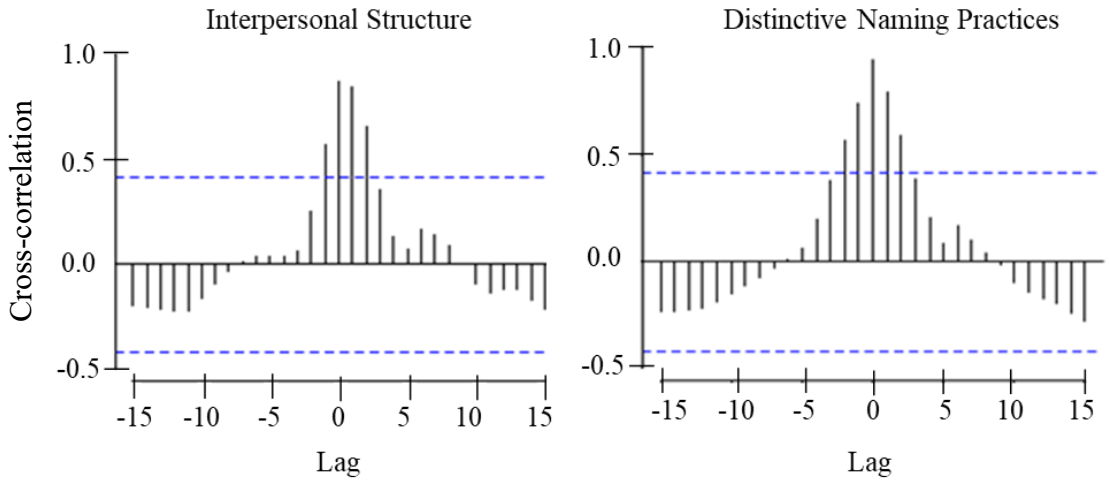

Figure 2. Cross-correlation functions depicting the relationship between year lags in ethnic diversity (x-axis), and its correlational strength to the standardized averaged measures of individualistic interpersonal structure (left) and distinct naming practices (right). Horizontal dotted lines reflect the level by which the correlations reach statistical significance.

Results from the cross-correlations are interpreted through the lag in years for the predictor variables. Negative lags represent the association between past time measures of the

variable *x* and future levels of the variable *y*. Positive lags represent the association between future time measures of variable x, with past measures of variable y. As depicted in Figure 2 above, the results appeared bidirectional for ethnic diversity, such that levels of ethnic diversity predicted individualistic interpersonal structure and naming practices with roughly 2-year lags in both directions. That is, shifts in ethnic diversity appear to both precede and follow changes in interpersonal structure and naming practices within a 2-year window.

While cross-correlations provide some insight into the temporal association between variables, results reflect offset correlations, and do not allow for any causal inferences. To follow up on these analyses, I utilized the Granger test for causality (Granger, 1969), a method used in various social science disciplines to test for causality between two trends measured together across time (e.g., economic levels and political policies, Chang, Chen, Gupta, & Nguyen, 2015). The Granger test offsets past measures of a time series variable *x* by certain number of lagged years, to predict future values of a different time series variable *y*. Results from this test yield an F-value statistic that indicates whether past values of variable *x* are a better predictor of future values of *y*, compared to past values of *y* predicting future values of *y*. Results from the Granger test for causality with 1, 2, and 3 year lags is presented in Table 3 below, demonstrating that the levels of ethnic diversity 1, 2, and 3 years into the past, marginally or significantly, predict current levels of distinct baby names. There was no significant association between lags in ethnic diversity to the averaged individualistic interpersonal structure measure.

Table 3
F Statistics from the Granger test of predictive causality with 1- 2- and 3-year lags

Averaged Individualism markers	1-yr	2-yr	3-yr
Interpersonal structure	< 1.00	3.14	1.75
Distinctive baby names	8.46^{**}	5.79^{*}	3.10†

Note. Numbers reflect *F*-value statistics. The degrees of freedom for each tests are (1, 19), (1, 17) and (1, 15) for 1-year, 2-year, and 3-year lags respectively.
†$p < .10$; $^{*}p<.05$; $^{**}p<.01$

Considering Autocorrelations through Bootstrapped Null Distributions. One concern with the interpretation of time-series data is the fact that time-series data are often highly correlated within itself, such that measures between elements in a series are highly correlated with other elements in the same series. One possible way of considering the role of autocorrelations is to contrast the association between the obtained correlations in the data, and the distribution of correlations one might expect to observe, given the observed levels of autocorrelation present in the data (see Tiokhin & Hruschka, 2017; Varnum, Krems, Morris & Grossmann, 2018). In this particular case, this method suggests that one can compare the correlational association between the observed values of ethnic diversity and individualism, with the range of correlations one might expect to see given the level of autocorrelation present in the ethnic diversity and individualism measures.

To test this, I first obtained the observed 1-year difference autocorrelation (ac) scores for the measure of ethnic fractionalization (ac = .789), the averaged individualistic interpersonal structure measure (ac = .716), and the averaged naming practice scores (ac = .758). I utilized the 'forecast' package in R, and the arima.sim to simulate 10,000 bootstrapped samples of expected correlational distributions. Figure 3 below depicts the expected null distribution of Pearson's *r* correlations between two variables with an ac measure of 0 (i.e., no autocorrelation; Panel A), a correlation between variables with ac scores .789 and .716 (i.e., the ac scores observed for ethnic diversity and individualistic interpersonal structure variables; Panel B), and ac scores of .789 and .758 (i.e., the ac scores for ethnic diversity and the averaged naming practices variables). The R syntax employed for this is available in Appendix A.

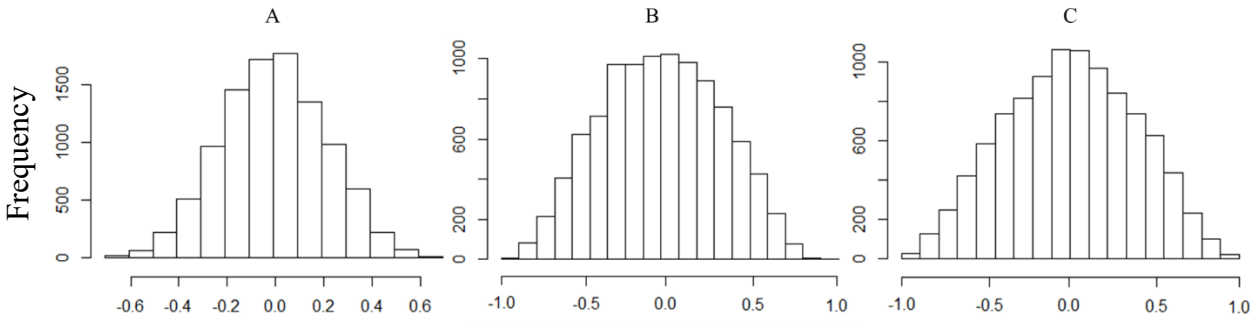

Figure 3. Frequency results of correlational distributions (x-axis) from a simulation of 10,000 bootstrapped samples, given the level of autocorrelations present between two variables. Panel A depicts the correlational distribution between two variables with 0 autocorrelations. Panel B reflects the distribution obtained with the autocorrelations observed for ethnic diversity and individualistic interpersonal structure, and Panel C depicts the distribution with autocorrelations observed for ethnic diversity and naming practices variable.

The critical values for each distribution was obtained by determining the upper and lower 2.5% of the simulated distributions. The association between ethnic diversity and measures of individualism were determined to be significant if they fell within these upper and lower range scores—that is, outside of the 95% bootstrapped confidence intervals (CI) of the distribution. The 95%CI range for the association between two variables with zero autocorrelations was represented by the range: [-.42, .42]. The 95%CI for the ethnic diversity and individualistic interpersonal structure was determined to be: [-.62, .62], while range for ethnic diversity and distinctive naming practices was: [-.65, .64]. For both of individualistic interpersonal structure and distinctive naming practices, the Pearson's correlation coefficient between ethnic diversity and the two measures of individualism were beyond the critical range of values measured, $r_{\text{interpersonal}} = .91$, $r_{\text{naming}} = .94$. This suggests that the association observed between these variables go beyond what would be expected between the association between two variables that were solely due to their levels of autocorrelation.

Study 1 Discussion

Results from historical trends suggest that levels of ethnic diversity over the past half

century predicted increasing rates of individualistic interpersonal structure and preferences for uniqueness in cultural practices. Across multiple methods of assessing these historical trends, ethnic diversity presented a consistent pattern of association with greater individualism. Results when detrending the variables suggested that ethnic diversity was positively related to measures of individualistic interpersonal structure, as well as distinctive naming practices when using the best-fit line detrending method, but not the first-order detrending method. An examination of the cross-correlations, as well as the Granger lagged analyses test suggests that changes in the levels of ethnic diversity precedes preferences for uniqueness in cultural practices. Finally, results from bootstrapped samples suggested that the association between ethnic diversity and individualism went beyond what would be expected for data that exhibited their levels of autocorrelation.

Overall, results from Study 1 demonstrate that ethnic diversity predicts the rising rates of individualistic cultural behaviour. While these results are promising, it is important to acknowledge that the ability to draw conclusions from them are limited by the type of data collected, as well as the availability of data. Time-series data presents challenges in terms of predictive causality because much of the association between two variables can often be explained by the fact that they co-occur together over time (Granger, 1969; Nelson & Schwert, 1982). Moreover, data collection of historical trends offer relatively small number of data points, suggesting that tests between the association of ethnic diversity and individualism may be statistically underpowered. Thus, while a large scale observation of historic data at the country-level is a good first step, it does not offer any nuanced perspective on what may be going on within the country—for example, whether the association between ethnic diversity and individualism may be operating differently for majority-minority group members.

Study 2

Results from Study 1 suggested that the rates of ethnic diversity in the US from 1950-2016 was a meaningful predictor of the rates of individualistic interpersonal livelihood and cultural practices. However, interpretation of the results was limited due to its time-series nature, sample size, and country-wide level of information. To address these concerns, Study 2 revised the level of assessment from the country-level to the state-level within the United States. Moreover, Study 2 capitalized on the availability of data from 2000-2016, assessing the overall levels of ethnic diversity in predicting individualism across each U.S states within this 17 year time period—resulting in 867 data points for levels of ethnic diversity and measures of individualism. In doing so, Study 2 follows up on Study 1 by drawing from a larger sample, offering greater statistical power, and accounts for the time-series data by analyzing years as a repeated measures variable—i.e., simultaneously assessing individual U.S. states and changes in the levels of ethnic diversity and individualism within those states over time. Provided that research suggests that Whites may be more threatened by minority group members moving into their neighbourhoods than vice-versa (Craig & Richeson, 2017a), it may be that individualism as a response to ethnic diversity may operate differently for majority and minority groups members. Thus, Study 2 also investigated the association between ethnic diversity levels and individualism within majority group members (those in the population identifying as White), and minority group members (any other ethnic group).

Method

Procedure. Study 2 adopted similar procedures to that of Study 1. Using large-scale public databases, I obtained measures within the 50 U.S. states, and the District of Columbia (henceforth included in reference to U.S states) from 2000-2016. This range of years was

selected because it offered the most current and consistent method of assessing ethnic distribution through the IPUMS. Following Study 1, I obtained measures of ethnic diversity and individualism as represented by interpersonal structures and distinct naming practices. For each of the following measures obtained through IPUMS, I obtained three categories of data for each U.S. state, within each year: i. Overall measures including all people in the state's population; ii. Measures for those in the state population identifying as White only; and iii. Measures for those in the state identifying as any ethnic category other than White.

Individualistic Interpersonal Structure. Following procedures from Study 1, I obtained five total markers of individualism through the IPUMS-USA data archive for each U.S. state. These measures included four individual-level variables: i. Divorce-to-marriage ratios; ii. The proportion of adults (18 years and older) living alone; iii. Average family size; and iv. Single-to-multichild families. I also computed one household-level variable: v. Third-to-single generation households. With the exception of divorce-to-marriage ratios, all variables were computed using identical procedures to Study 1. The divorce-to-marriage ratio was computed through IPUMS, as the method to obtain these rates in Study 1 were not available for each individual state. Specifically, within IPUMS, I computed the proportion of individuals reporting their marital status as divorced, relative to those who identified as married (including those with spouses present or absent from the household). Following Study 1, I computed a composite measure of each by standardizing the measures within each U.S. state, and averaging the five measures of individualism together. Analyses focus on both the individual measures of individualistic interpersonal structure, as well as the averaged standardized scores.

Cultural Practices. As with Study 1, I used data available from the Social Security Administration to collect data on naming practices within each U.S. state from 2000-2016.

Preference for the distinctive baby names was operationalized identically to Study 1. Specifically, a proportion score was computed for male and female babies receiving the 20 most popular names in a given U.S. state, in a given year, relative to the overall proportion of other baby names within that U.S. state and year. For each gender, a distinctiveness index was computed by subtracting one from the proportion score, such that higher scores reflected a greater preference for distinctive baby names. I averaged the standardized distinctive baby name indices for male and female babies within each state to obtain a composite index of distinctive baby naming practices. Analyses for Study 2 focus on both the separate scores for each gender, as well as the average standardized measures.

Ethnic Diversity. Using IPUMS, I obtained the ethnic distribution of the eight ethnic groups identified in Study 1 for each U.S. state from the years 2000-2016. For each U.S. state and year, I computed a measure of ethnic diversity using the ethnic fractionalization (EF) index (Alesina et al., 2003) described in Study 1.

Study 2 Results

Overall, there was wide degree of variability between each U.S. state in measures of ethnic diversity. The state with the highest rate of ethnic diversity from 2000-2016 was Hawaii (M = .80, SD = .005), whereas the state with the lowest was Vermont (M = .08, SD = .02). Appendix B presents the mean level ethnic fractionalization for each individual state.

To assess the association between ethnic diversity and measures of individualism, I utilized a multi-level modeling approach. Each U.S. state was treated at the individual-level, with years utilized as the repeated measures variable. Analyses were performed using a linear mixed model in SPSS, specifying an autoregressive moving average (ARMA(1,1)) covariance structure that is utilized for time-series analyses (e.g., Boone, 2005; Krone, Albers, & Timmerman, 2017).

For the analyses, all measures were standardized. Table 4 below presents the results for the whole population. Table 5 presents the results when separated by White and Non-White populations.

Table 4

Estimates of fixed effects from multi-level modeling ethnic diversity predicting individualism markers across the whole U.S. population (Study 2)

Individualism markers	Intercept	*B*(*SE*)
Interpersonal structure		
i. Divorce-to-marriage	-.03	.23(.03)***
ii. Adults living alone	-.05	.26(.03)***
iii. Smaller family size	-.01	.34(.04)***
iv. Single-to-multiple child households	.005	.27(.04)***
v. 3rd-1st gen. households	.03	.22(.04)***
Distinctive naming practices		
vi. Boys	.76	.003(.001)***
vii. Girls	.77	.003(.001)***

*** $p<.001$

Table 5

Estimates of fixed effects from multi-level modeling ethnic diversity predicting individualism markers split by majority-minority population indicators (Study 2)

	White population		Non-White population	
Individualism markers	Intercept	*B*(*SE*)	Intercept	*B*(*SE*)
Interpersonal structure				
i. Divorce-to-marriage	-.02	.25(.03)***	-.01	.28(.04)***
ii. Adults living alone	-.04	.33(.03)***	-.03	.30(.04)***
iii. Smaller family size	.01	.50(.03)***	-.01	.24(.04)***
iv. Single-to-multiple child households	.00	.33(.04)***	.001	.004(.07)†
v. 3rd-1st gen. households	.03	.13(.04)**	.001	.02(.04)

Note. Measures of distinctive naming practices within White and Non-White populations were not available and thus not analyzed for these sub-population groups.
†$p < .10$; ** $p<.01$; *** $p<.001$

Results presented in the table suggest that levels of ethnic diversity across the U.S., while accounting for each individual state, was significantly positively related to most measures of individualism during the 2000-2016 time period, with the only exception being the multi-to-single generation household measure. Levels of ethnic diversity predicted greater multi-to-single

generation households, which theoretically reflects lower levels of individualistic interpersonal structure. When assessing the effect of ethnic diversity levels on White and Non-White populations' interpersonal livelihood, the White population exhibited the same direction of results as found in the whole population. Results were similar for the Non-White population, except that ethnic diversity no longer predicted their rates of multi-to-single generation households, and marginally predicted their rates of single-to-multiple child households.

Study 2 Discussion

Results from Study 2 follow up and support results from Study 1, observing the same variables at a different level of analysis. Specifically, Study 1 demonstrated that greater levels of ethnic diversity predicted levels of individualistic interpersonal structure and distinctive naming practices across the United States, when observing and account for their association within each U.S. state from the years 2000-2016. Study 2 also offered insight into the association between ethnic diversity and individualism for different sub-populations within the U.S. With the exception of greater levels of third-to-first generational households, ethnic diversity was associated with greater individualistic interpersonal structure for both the White and Non-White population. Notably, these effects were stronger for Whites (vs. Non-Whites) for the measures of smaller family sizes and single child households. Greater ethnic diversity predicted greater levels of third-to-first generation households in the White population, but showed no association in the Non-White population. The finding that ethnic diversity predicts greater third-to-first generation households converges with findings from Study 1, which also demonstrated a similar pattern.

Study 3

Studies 1 and 2 demonstrated that at the macro-level, across the United States, greater ethnic diversity predicted greater individualistic behavior. Study 3 aimed to move to an

individual level of analysis, testing whether a person's perception and experiences with ethnic diversity is associated with individualism. Specifically, the goals of Study 3 were to assess whether greater ethnic diversity in one's community predicts individuals reporting s greater independent social orientations, a cultural pattern that reflects greater individualism (Varnum, Grossmann, Katunar, Nisbett, & Kitayama, 2008). These results reflect a different level of analysis from Studies 1-2, capturing cultural values and individualistic representations of the self for individuals. These tests would be meaningfully different because cultural psychologists have demonstrated that cultural values can manifest themselves differently at a group-level vs. individual-level of analyses (Na et al., 2010).

Following results from Studies 1-2, I hypothesized that participants who lived in areas of high ethnic diversity would be more likely to endorse an independent social orientation. Given the prior research suggesting the importance of interethnic contact in shaping representations of the self, I also predicted that individualism in response to ethnic diversity would be accounted for by the amount that a person interacts with the ethnic diversity in their environment. That is, I predicted that interethnic contact should mediate the effect of ethnic diversity on individualism. Study 3 assessed participant's report of ethnic diversity in their communities, experiences of interethnic contact and interethnic anxiety, and the consequences of these experiences on endorsing an independent social orientation.

Method

Participants. Due to the novel nature of this study, I utilized a G*power analysis to compute the total sample size needed to detect an effect of $r = .20$, which would roughly be considered a medium effect size (Cohen, 1992). The analysis suggested a total sample size of approximately 200 participants to achieve a statistical power of .80, a commonly recommended

level of power in psychological research (Bakker, Hartgerink, Wicherts, & van der Maas, 2016). Because this study was exploratory in nature, I aimed to recruit two times the recommended sample size, seeking to obtain roughly 400 participants to investigate the association between perceived ethnic diversity and individualism. I hypothesized that greater ethnic diversity may have the strongest effect for majority group members, which prior research suggests may experience the strongest effects of growing ethnic diversity (e.g., Craig & Richeson, 2014b). Thus, participants were required to identify as White to participate in this study. A total of 401 participants were recruited through Amazon's Mechanical Turk and compensated $0.75 USD for their participation. Following pre-registered exclusionary criteria, participants were excluded if they reported that they were more distracted than they were serious about the study, spent fewer than six minutes on the survey, or if they did not successfully complete the measures of individualistic cultural values. Twenty-nine participants were excluded leaving a final sample size of 372 participants. Full demographic information is presented in Table 6.

Table 6

Demographics for Studies 3-6.

	Study 3	Study 4	Study 5	Study 6
Final N	372	94	355	352
Median Age	34	19	35	34
Median Income	$51-$61k	--	$51-$61k	$51-$61k
Mean Social Class	2.62	3.21	2.72	2.66
Mean Political Ideology	4.49	--	4.44	4.40
Gender (f/m/other)	215/154/3	61/33	199/152/4	222/128/2
Ethnicity %				
White	100.0	51.2	74.1	81.8
Black	–	1.4	9.0	11.1
Latino/Hispanic	–	0.0	8.2	6.0
East Asian	–	39.7	7.0	2.0
South Asian	–	26.6	3.7	2.3
Pacific Islander	–	–	0.0	1.1
Aboriginal	–	5.4	–	–
Middle eastern	–	4.2	–	–
Native American	–	–	0.8	3.4
Other	–	0.0	1.7	1.1

Note. Final *N* = sample size subsequent to screening procedures as described in the recruitment sections of each study. Sample size and demographics in Study 4 reflect participants who completed both T1 and T2 surveys. Participants in all studies were allowed to report an identification with multiple ethnic backgrounds. Measures of social class reflects participants' self-identification on a scale from 1 (working class) – 3 (middle class) – 5 (upper class). Measures of income reflect participant's report of their immediate household income. Participants were allowed to select from 9 categories, ranging from Less than $11,000, to more than $80,999, with $10,000 increments for each category. Measures of political ideology was assessed on a scale ranging from 1 (very conservative) – 4 (moderate) – 7 (very liberal).

Procedure. Participants began the study by reporting their demographic characteristics, assessing their gender, age, and ethnic background. Following their demographics, participants were asked to reflect on the area/region/county they grew up in and where they currently resided if it was different from where they grew up. As outlined in the subsequent section below, participants then reported their estimate of the ethnic distribution in their communities, followed by measures aimed at assessing their individualism. Finally, participants completed a few additional demographic questions on their social class background and political ideology.

***Demographics*.** Participants were allowed to identify their gender as either male, female, or other. For measures of ethnic background, participants were provided eight ethnic background categories and asked to indicate which ethnic group they identified with (see Table 6). Participants reported their political ideology with the following question: "How would you describe your political leanings?" on a scale from 1 (very conservative) to 7 (very liberal), (M = 4.49, SD = 1.77). Participants reported their social class group with the following question: "With which social class group are you most identified with in terms of income and education?" Participants were offered five categories on the following scale: 1 (working class) – 2 (lower middle class) – 3 (middle class) – 4 (upper middle class) – 5 (upper class), (M = 2.52, SD = .93).

Ethnic Diversity. Participant's levels of ethnic diversity in their community were assessed both subjectively and objectively. Subjective perceptions of ethnic diversity were assessed through participant's estimation of the ethnic distribution in their communities. Participants first reported their estimation of the distribution of ethnic groups where they grew up and then their estimation for where they currently resided. Prior to reporting the ethnic distribution where they grew up, participants were prompted with: "We are interested in the demographic characteristics of where you grew up. Please think of the area/region/county where you were raised between the ages of 13-18. If there was more than one area, please pick one that felt the most meaningful for you. If this is the same region that you live in now, please answer the following questions as you felt the community was in the past." Prior to being asked to report their estimate of the ethnic distribution in their current community, participants were provided similar instructions: "For this next portion we are interested in the demographic characteristics of where you are now. Please think of the area/region/county where you live now. If this is the same region as you grew up in, please answer the following questions as you feel your

community is at this current time." For both past and present ethnic diversity measures, participants were provided the following instruction on a separate page:

> Please report what you think the distribution of the racial/ethnic population [was/is] like in your local community. The numbers can be thought of as percentage points of the total overall population in your [local community at the time / current local community]."

Based on the distribution of ethnic groups collected by the U.S. census, participants were presented with seven ethnic categories: i. White or European American; ii. Black or African American; iii. Hispanic, Latino, or Spanish Origin; iv. Chinese, Asian Indian or Other Asian; v. American Indian or Alaska Native; vi. Native Hawaiian or other Pacific Islander; vii. Other. Participants reported the percentage that they felt each ethnic group represented in their community, and were required to total their responses to 100. Utilizing participant's reports of ethnic distributions, an ethnic fractionalization (EF) score as described in Study 1 was computed for a measure of past and present subjective ethnic diversity (M_{past} = .40, SD = .23; $M_{present}$ = .53, SD = .19). As with Studies 1 and 2, EF scores reflect the likelihood that two randomly selected individuals in a population would be from different groups. Thus, higher EF scores reflect greater ethnic diversity.

To assess objective levels of ethnic diversity in their community, participants were asked to report the name of the city/region where they lived, and the zip code or postal code of their city. Utilizing this information, the ethnic distribution of groups in participants' reported cities and towns were obtained through publicly available data collected by the U.S. census bureau (https://www.census.gov/data.html). At the time of data collection, ethnic distributions by zip code was available for the years 2010 and/or 2014. The latest available year was always used. In the event that participant's zip code did not match a location, reported regional data was used to estimate where participants resided. Based on the availability of the data, the percentage of

ethnic categories for participant's reported zip code area were collected for the following seven groups: i. White (non-Hispanic or Latino); ii. Black or African American; iii. Hispanic or Latino; iv. Asian (alone); v. American Indian and Alaska Native; vi. Native Hawaiian and Other; vii. Two or more races. Because census data for particular areas are not always available and permits an individual to identify with multiple ethnic groups, the sum of the ethnic groups ranged from 62.00% to 129.20%, with a mean of 101.85% (*SD* = 5.41). One participant provided an unidentifiable city and zip code and their data was excluded from assessment of objective ethnic diversity. Using the distribution provided by the U.S. census, an EF score was computed as a measure of objective ethnic diversity. Objective ethnic diversity was only obtained for participant's reports of their current area of residence (*M* = .44, *SD* = .20).

Individualism Measures. To assess participant's individualism, two measures were included. First, participants completed a measures of individualistic self-construal using a 24-item self-construal measure (Singelis, 1994). Participants then completed an assessment of third- vs. first-person autobiographical memory (Cohen & Gunz, 2002). Participants completed the two measures in a randomized order.

The Singelis self-construal scale included 12 items assessing individualistic self-construal (e.g., "I enjoy being unique and different from others in many respects"), as well as 12-items assessing collectivistic self-construal (e.g., "I will sacrifice my self-interest for the benefit of the group I am in"). Items were presented in a randomized order and participants rated their agreement on with each item on a scale from 1 (strongly disagree) to 7 (strongly agree). Mean responses were computed separately for the individualistic items (*M* = 4.99, *SD* = .86; α. = .81) and collectivistic items (*M* = 4.51, *SD* = .86; α. = .83). In accordance with my proposed hypotheses, I will focus the report of my analyses on the averaged individualistic self-construal

items; however, similar analyses were also performed on the collectivism items.

Assessment of third-vs first-person autobiographical memory was designed to capture participant's individualism. Prior research suggest that those within an individualistic context are more likely to take a first-person perspective, as opposed to an outsider perspective, when it comes to the self (Cohen, Hoshino-Browne, & Leung, 2007). Adopting a similar paradigm to Cohen and Gunz (2002), participants were asked to separately recall four past experiences, a time when they: i. were in a group performance; ii. had a conversation with a friend; iii. were embarrassed; and iv. interacted with a family member. The four experiences were in a fixed order and for each, participants were asked to take a minute to describe the event. Participants were then asked to reflect on the memory and whether it was a first-person memory, described as "In your memory, you imagine the scene from your original point of view, *not* as an external observer would see it", or if their memory was a third-person memory, described as "In your memory, you imagine the scene as an observer might see it". Participants then rated their memory on a scale from 1 (entirely a first-person memory) to 7 (entirely a third-person memory). An overall average score for the four instances was obtained as a measure of first-person vs. third-person perspective (M = 2.35, SD = 1.27; α. = .69). This score was then reverse-coded such that higher scores indicated greater first-person perspectives, and thus greater individualism.

Interethnic Contact and Interethnic Anxiety. Interethnic contact (IEC) was assessed through a 4-item measure (e.g., I frequently have contact with people from another racial/ethnic background). Interethnic anxiety (IEA) was assessed through an 11-item measure that was adapted from prior research (Britt, Boniecki, Vescio, Biernat, & Brown, 1996; e.g., "I would feel nervous if I had to sit alone in a room with a person of another race and start a conversation"). Both scales were rated by participants on a scale from 1 (strongly disagree) to 7 (strongly agree).

An average score was computed for both interethnic contact (M = 4.41, SD = 1.55 α. = .90) and interethnic anxiety (M = 2.92, SD = 1.16, α. = .90). A full list of the items for both the interethnic contact and intergethnic anxiety scale is available in Appendix C.

Study 3 Results

To examine whether demographic variables influenced individualistic endorsement, I tested whether political ideology, social class, and gender predicted the measures of individualism. Political ideology did not significantly predict ratings of individualistic self-construal, ps > .374, though higher social class suggested a non-significant trend toward less individualistic self-construal, r = -.10, p = .059. Neither political ideology nor social class ratings were related to participant's expression of first person perspectives, ps > .621, and was also not related to collectivistic self-construal, |rs| = .04-.08. There were no gender differences in the endorsement of individualistic self-construal, ps > .163, but females reported greater first-person perspectives (M = 5.79, SD = 1.20) than males, (M = 5.44, SD = 1.34), F(1, 367) = 7.00, p = .008.

Ethnic Diversity and Individualistic Cultural Values

Participant's reporting high subjective ethnic fractionalization in their past environments, also reported greater ethnic fractionalization in their current environment, r = .44, p < .001. The objective ethnic diversity measure obtained through participant's zip code information was significantly related their subjective perceptions of ethnic diversity in their community, r = .42, p < .001. First-person perspectives and individualistic self-construal were positively related to each other, r = .15, p = .005.

To assess the association between ethnic diversity and individualism, I examined the association between participant's subjective ethnic fractionalization scores for their past and

present communities, and their objective ethnic fractionalization measure for their current communities, in relation to the measures of individualism. As shown in Table 7, there were no significant associations between each of the measures of ethnic diversity and each of the measures of individualism.

Table 7
Zero-order correlations between collected measures and individualism measures (Study 3)

Measures	Individualistic self-construal (Singelis)	First vs. third person perspective
1. Past subjective EF	.05	-.06
2. Present subjective EF	-.03	-.07
3. Objective EF	.07	-.07
5. IEC	.13*	.002
6. IEA	-.27***	-.14**

Note. All individualistic indicators are coded such that higher scores reflect greater individualism.
*p<.05; **p<.01; ***p<.001

Interethnic Contact and Interethnic Anxiety

Participants reporting less interethnic contact reported greater interethnic anxiety, r = -.48, p < .001. All measures of ethnic diversity were positively associated with greater interethnic contact, $r_{\text{objective}}$ = .31, $r_{\text{subjective past}}$ = .19, $r_{\text{subjective present}}$ = .30, ps < .001. However, none of the measures of ethnic diversity were significantly related to interethnic anxiety, |rs| = .007 - .04, ps > .396. As shown in Table 5, participants reporting greater interethnic contact also showed a small association toward greater endorsement of individualistic self-construal, but not first-person perspectives. Participants reporting greater interethnic anxiety were less likely to endorse an individualistic self-construal and less likely to report first-person perspectives.

Mediation of Interethnic contact and Interethnic anxiety. To assess whether ethnic diversity contributes to greater individualism through greater interethnic contact, I tested the mediation of interethnic contact on the relationship between the ethnic diversity measures and

the endorsement of an individualistic self-construal (see Figure 4). Utilizing Hayes PROCESS macro in SPSS, I performed a test of the indirect effect of ethnic diversity on individualistic self-construal through interethnic contact using 5000 bootstrapped samples. Indirect effects are considered significant if 0 does not fall between the 95% bootstrapped confidence intervals (Preacher & Hayes, 2004). The indirect effect of interethnic contact was significant for each measure of ethnic diversity: $95\%CI_{objective}$ [.005, .07], $95\%CI_{subjectivepast}$ [.005, .05], $95\%CI_{subjectivepresent}$ [.01, .08]. Interchanging ethnic diversity and interethnic contact in the pathway model was not significant for any measure of ethnic diversity.

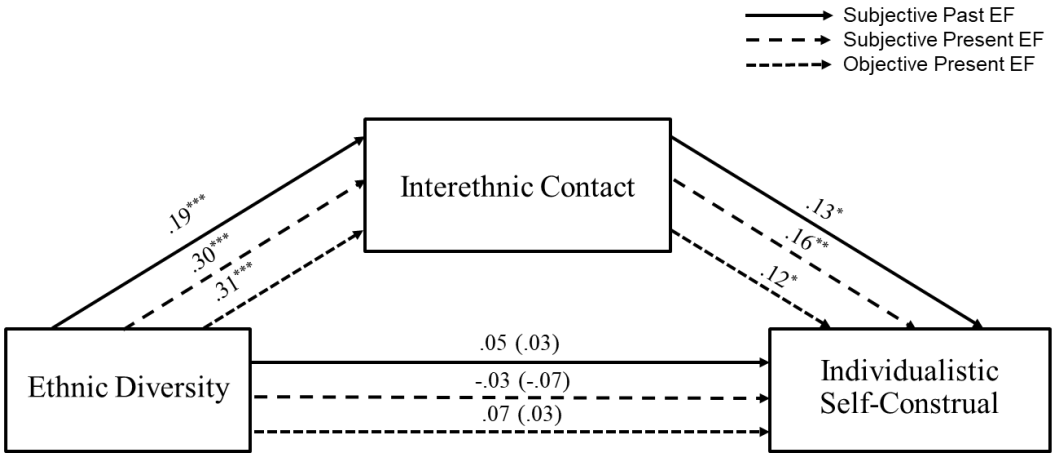

Figure 4. Tests of the indirect effect of interethnic contact on the relationship between measures of ethnic diversity and individualistic self-construal (Study 3). Tests of the three forms of ethnic diversity assessed was performed independently of others in the model. Numbers reflect standardized betas, and numbers in parentheses reflect the total effect.
$^{*}p<.05$; $^{**}p<.01$; $^{***}p<.001$

I also tested the indirect effect of interethnic anxiety on the relationship between ethnic diversity and individualistic self-construal. The results of this pathway model was not significant for any measure of ethnic diversity: $95\%CI_{objective}$ [-.02, .03], $95\%CI_{subjectivepast}$ [-.02, .03], $95\%CI_{subjective\ present}$ [-.01, .04]. Provided that participants reporting greater interethnic contact tended to report lower interethnic anxiety, I also tested the following serial pathway: Ethnic diversity ➔

Interethnic contact ➔ Interethnic anxiety ➔ Individualism, for each measure of ethnic diversity and individualism. This serial pathway (depicted in Appendix D) was significant for each measure of ethnic diversity on individualistic self-construal: $95\%CI_{objective}$ [.02, .06], $95\%CI_{subjective\ past}$ [.009, .04], $95\%CI_{subjective\ present}$ [.02, .06], as well as first-person perspectives: $95\%CI_{objective}$ [.01, .07], $95\%CI_{subjective\ past}$ [.005, .04], $95\%CI_{subjective\ present}$ [.01, .07]. In each case, greater ethnic diversity predicted greater interethnic contact, which predicted lower interethnic anxiety. Lower interethnic anxiety in turn was associated with greater individualism.

Study 3 Discussion

Study 3 provided the first correlational evidence that greater ethnic diversity is associated with greater interethnic contact, which in turn was associated with greater individualism. Results demonstrated that the association between ethnic diversity and individualism is in part statistically accounted for by greater interethnic contact. This pattern of results emerged both for objective and subjective measures of ethnic diversity, including the recollection of the ethnic diversity in one's past communities. Although interethnic anxiety did not mediate the association between ethnic diversity and individualism, it was negatively associated with both individualism measures—i.e., first person perspectives and individualistic self-construal, suggesting that those who reported having greater interethnic anxiety were less likely to endorse individualism. A serial pathway model tested whether interethnic contact may be associated with lowered interethnic anxiety, and thus greater individualistic self-construal. This pathway was significant, suggesting the possibility that ethnic diversity may shape individualism through increased interethnic contact and a subsequent reduction in interethnic anxiety. Notably, because the study employed a correlational design, it does not allow for causal claims in the relationship between ethnic diversity and individualism.

Study 4

Study 3 provided evidence of a relationship between ethnic diversity and individualism at an individual level, finding that those who reported greater ethnic diversity in their communities also reported greater interethnic contact, which in turn promoted their endorsement of individualism. Study 4 sought to replicate these findings and expand upon them in several ways. First, Study 4 utilized an undergraduate sample, which provided an opportunity to uniquely and concretely assess participants' perceptions of ethnic diversity in their environment (in their academic courses). Second, Study 4 involved a repeated measures research design, allowing the investigation of whether the endorsement of individualism may shift over time in response to one's degree of exposure to ethnically different others. Finally, Study 4 aimed to explore whether adopting individualistic values has downstream consequences for a person's well-being. Following the results of Study 3, I hypothesized that greater ethnic diversity in one's immediate environment should involve greater interethnic interactions, thus contributing to a greater endorsement of an individualistic self-construal. Moreover, I also hypothesized that greater ethnic diversity in one's environment should yield an increase in a greater endorsement of individualism over time.

Method

Participants. 176 University of Waterloo undergraduate participants were recruited throughout the 2016-2017 academic year for a larger study on academic performance of well-being. Participants were asked to complete an online survey during a 2-week window at the start (Time 1; T1) and end of the academic term (Time 2; T2). Those who completed both T1 and T2 measures were entered into a raffle for a $50 CAD cash prize. Of the 176 participants recruited for this study, 94 participants completed ratings at both T1 and T2. Unless otherwise noted,

presented results are only from the participants who completed both T1 and T2 measures. Participants reported which faculty they were enrolled into at the University of Waterloo (17 Arts, 3 Applied Health Sciences; 26 Engineering; 3 Mathematics; 43 Science). Further demographic information is presented in Table 6.

Procedure. Throughout the 2016-2017 academic year, course instructors were contacted during the first week of the term if their course syllabus listed group assignments as part of their course curriculum. Instructors throughout the University of Waterloo were asked to post a message on their course's online learning platform, or make announcements in their course to ask their students to participate in this study. Participants were provided until the end of the third week of the academic term to take part in the T1 survey. Participants who completed the T1 survey were contacted through their provided email address at the end of the academic term to participate in the T2 survey, which was required to be completed within the final 2 weeks of the academic term.

Time 1 Survey. Participants began the study by indicating which course they were completing this survey for and then completed demographic questions assessing their gender, age, ethnic background, and social class. These measures were identical to those described in Study 3. As this was part of a larger study, participants completed several scales in the survey that are unrelated to the study hypotheses. Relevant scales to the theoretical position in this paper are discussed in the subsequent sections below.

Ethnic Diversity. Participants reported their subjective ratings of ethnic diversity in their course through a modified question from Study 3. Specifically, participants were instructed: "To the best of your ability, please report how you feel the distribution of the racial/ethnic population is in [course name]." Similar to the method in Study 3, participants were provided ethnic

categories, modified to adjust for a Canadian based sample. There were eight racial/ethnic categories: i. White or European; ii. Black or African; iii. Hispanic, Latino, or Spanish origin; iv. Middle Eastern; v. Ease Asian; vi. South Asian; vii. Aboriginal; viii. Other. Using participant's reported distribution, a measure of subjective ethnic fractionalization (EF) as described in Study 1 was computed, with scores reflecting the probability that two randomly selected individuals would be from different ethnic groups (M = .67; SD = .19).

Well-being. To assess participant's well-being, participants reported on their feeling of belongingness to the University and their satisfaction with life (SWL). To measure belongingness, participants rated their agreement on a scale from 1 (strongly disagree) to 7 (strongly agree) to the following three statements: i. "I feel that I belong (i.e., feel accepted by others) in this course"; ii. "I worry about whether I belong in this course" (reversed); and iii. "I feel that I belong at the University of Waterloo" (M = 5.32; SD = 1.16, α = .60). Participants also completed the 5-item satisfaction with life scale (e.g., I am satisfied with my life; Diener et al., 2003; Diener, Emmons, Larsen, & Griffin, 1985) on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*) (M = 4.56; SD = 1.36, α = .87).

Individualism-Collectivism. Participants completed a subset of the Singelis' self-construal scale described in Study 3. The modified version included 10-items, with five statements reflecting individualistic self-construal (M = 4.91 SD = .81, α = .55[6]) and five statements reflecting collectivistic self-construal (M = 4.97; SD = .92, α = .61). Individualistic self-construal

[6] Different scholars have offered different rules of thumb for what are considered a reliable α to capture internal consistency in a scale. For example, Hinton, McMurray, Brownslow, & Cozens (2004) suggest that a α ≥ .70 suggests good internal consistency, but that a measure > .50 is also acceptable. In the cross-cultural literature, researchers suggest that Singelis' self-construal scale tends to yield low reliability measures (Levine et al., 2003). For this reason, future studies utilize a revised measure of individualism.

and collectivistic construal measures were not significantly correlated, $r = .03$, $p = .764$. Thus, both measures are analyzed as separate constructs. I focus on the individualistic self-construal measure in subsequent analyses.

Time 2 Survey. Participants began the study by entering their student information (e.g., student identification number, e-mail address) in order to connect their survey with their T1 measures. Similar to the T1 survey, participants then completed several other measures.

Ethnic Diversity. Ethnic diversity was assessed and computed using the same method in the T1 survey. Using participants reported distribution of ethnic groups in their course, I computed a measure of subjective EF ($M = .61$, $SD = .26$).

Well-being. As described with T1 variables, measures of belongingness ($M = 5.25$; $SD = 1.23$, $\alpha = .68$) and SWL ($M = 4.47$; $SD = 1.34$, $\alpha = .89$) were collected using the same questions and methodology.

Individualism-Collectivism. Individualism and collectivism were measured using the same method in the T1 survey. The individualism ($M = 4.97$, $SD = .92$, $\alpha = .69$) and collectivism ($M = 4.92$; SD = .69; $\alpha = .48$) scores were not significantly correlated, $r = -.11$, $p = .278$.

Interethnic Contact and Interethnic Anxiety. Measures of interethnic contact (IEC) and interethnic anxiety (IEA) were added in the T2 survey and were the last measures collected in the T2 survey. Both measures were assessed using identical scales described in Study 3. IEC was assessed using the 4-item scale ($M = 5.30$, $SD = 1.46$, $\alpha = .86$) and IEA was assessed using the 11-item scale ($M = 2.64$, $SD = .98$, $\alpha = .84$).

Study 4 Results

The average amount of time between data collection at Time 1 and Time 2 was 59 days ($SD = 9$, $Mdn = 56$), with a range of 47 to 83 days. T1 measures were all significantly positively

correlated with their corresponding T2 measures: $r_{\text{subjectiveEF}} = .45$, $r_{individualism} = .50$, $r_{collectivism} = .54$, $r_{\text{belongingness}} = .63$, $r_{\text{swl}} = .78$; all *p*s < .001. Table 8 presents the zero-order correlations between variables collected during T1 and T2.

Table 8
Zero-order correlations between scales assessed (Study 4)

Measures	1	2	3	4	5	6	7
1. Subjective EF	[.45***]	.05	-.12	-.12	-.09	--	--
2. Individualism	.09	[.50***]	.01	.12	.21*	--	--
3. Collectivism	-.16	-.07	[.54***]	-.01	.06	--	--
4. Belongingness	.34**	.28**	-.09	[.63***]	.39***	--	--
5. SWL	.03	.28*	.005	.43***	[.78***]	--	--
6. IEC	.22*	.30**	.07	.30**	.10	[--]	--
7. IEA	-.20†	-.19†	.11	-.34**	.007	-.46***	[--]

Note. The diagonal, represented by correlations in brackets, reflects the relationship between each measure across the two time points. Time 1 correlations are above the diagonal and include all participants who completed Time 1 measures. Time 2 correlations are below the diagonal.
†$p < .10$; $^{*}p<.05$; $^{**}p<.01$; $^{***}p<.001$

As presented in Table 8, the association between T1 ethnic fractionalization was not significantly related to participant's endorsement of individualism at T1, $r = .06$, $p = .586$. In the interest of testing whether perceptions of ethnic diversity in the classroom predicted greater individualism through interethnic contact and interethnic anxiety, I focused on Time 2 measures because interethnic contact and interethnic anxiety were only assessed at Time 2. Following procedures described for testing mediation in Study 3, I assessed the mediation of interethnic contact on the association between T2 ethnic fractionalization and T2 individualism. The test of this mediation pathway was significant, 95% CI[.03, .62], suggesting that greater perceptions of ethnic diversity predicted greater interethnic contact, which in turn was associated with a greater endorsement of individualism. The mediation test replacing interethnic contact with interethnic anxiety was not significant, 95% CI[-.02, .47].

To address whether greater individualism in response to ethnic diversity can contribute to

greater well-being, I also tested the following serial pathway model: T2 Ethnic fractionalization ➔ Interethnic contact ➔ T2 Individualism ➔ T2 Well-being measures. For well-being measures, I tested participant's reports of belongingess and SWL. The pathway model involving measures of belongingness was not significant, 95% CI[-.0001, .32], but the model with SWL was, 95%CI [.005, .38]. Interchanging SWL and individualism in the path model was not significant, 95%CI [-.006, .11] suggesting that greater individualism contributed to greater SWL.

Temporal Analyses. To test whether greater ethnic diversity at the start of the academic term predicted greater individualism at the end of the term, I first created a difference score between participants' endorsement of individualism at T2 and endorsement of individualism at T1, taking the resulting measure as an indicator of change in individualism over time. T1 and T2 measures of individualism did not significantly differ from each other, with a mean difference of .04 between the two time points, $t(93) < 1.00$, $p = .617$. Ethnic fractionalization at T1 was marginally positively related to the T2 vs. T1 difference score in individualism, $r = .19$, $p = .066$, suggesting a small effect size for correlation coefficients (Cohen, 1992). This association suggests that greater ethnic diversity at T1 tended to predict an increased endorsement of individualism at T2, relative to participant's endorsement of individualism at T1.

To explore the causal direction of this association, I performed a cross-lagged panel analysis (Selig & Little, 2012) testing the association between T1 ethnic fractionalization and T2 individualism, controlling for each variable at its opposing time point. This cross temporal analyses allows for greater confidence in the causal direction of the association between two or more measurements collected at different time points (see Orth, Robins, & Roberts, 2008, for an example). T1 and T2 individualism were measured as latent constructs of the five individualistic self-construal items. Figure 5 represents the structural equation model used for this test. The

pathway model showed good fit, RMSEA = .036, PCLOSE = .649, CFI = .970. Although guidelines for what is considered a reasonable indicator for good model fit varies, an RMSEA score < .08, PCLOSE > .05 and CFI > .95 are generally considered markers of good fit (Meyers, Gamst, & Guarino, 2006).

Results from the cross-lagged panel analysis revealed that greater perceptions of ethnic diversity at the start of the academic term significantly predicted greater individualism at the end of the term, $B = 1.19$, $SE = .54$, $p = .027$, whereas the reverse case of individualism at T1 predicting ethnic diversity at T2 was not significant, $B = .201$, $SE = .14$, $p = .152$.

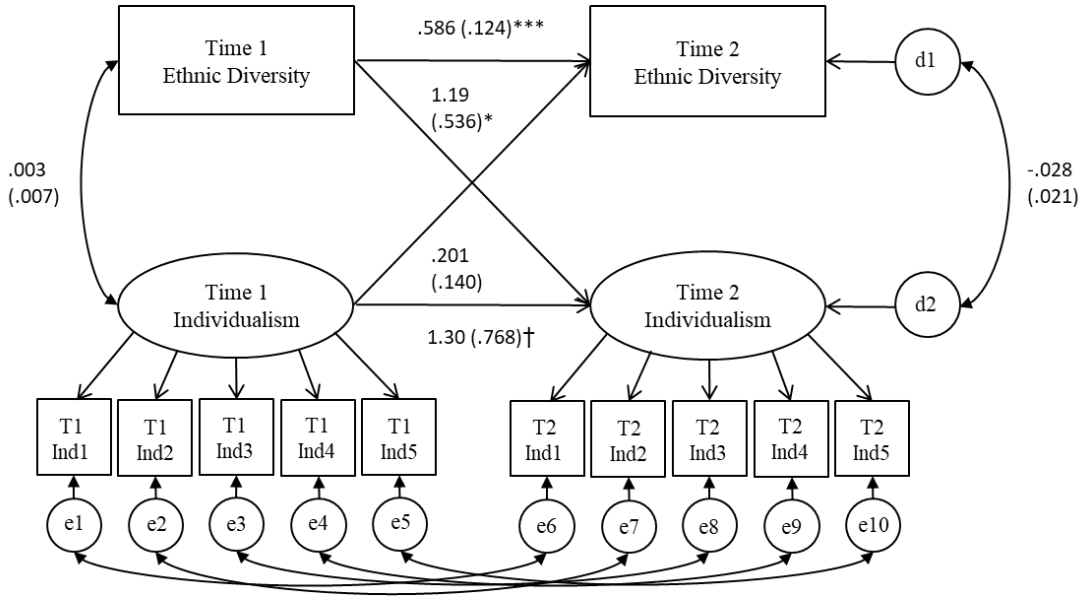

Figure 5. Path model of ethnic fractionalization and individualism across two different time points (Study 4). Individualism measures were classified as a latent variable from the Singelis' self-construal scale items at both time points. Numbers reflect the unstandardized estimates, with standard error in parentheses. Straight arrows represent regression paths and the curved arrows represent correlations.
† $p < .10$, *$p < .01$, ***$p < .001$.

Study 4 Discussion

Converging with results obtained in Study 3, Study 4 results provide further evidence that perceptions of greater ethnic diversity in one's environment is indicative of one's tendency to endorse individualism. As with Study 3, Study 4 supports the notion that the association between ethnic diversity and individualism is in part statistically accounted for by greater interethnic contact, but not interethnic anxiety. Overall, Study 4 demonstrates that the association between ethnic diversity and individualism persists within an ethnically diverse student population at a major Canadian university. Moreover, the temporal nature of Study 4 allowed for a test of whether ethnic diversity predicts changes in individualism over time. Based on results across two different time points, perceptions of greater ethnic diversity at the start of an academic term resulted in a greater individualistic endorsement at the end of the academic term. It is worth noting that limitations in the study design caution against the strength of the conclusions in these findings. The relatively low sample size, unique sample, and limitations to only two waves of data collection suggests that conclusions about the strength, generalizability, and longitudinal effects should be carefully considered. With that caveat, the findings from Study 4 however offer preliminary support for the directional shift of greater individualism in environments perceived to be more ethnically diverse. Moreover, Study 4 also offers preliminary insight into the potential consequences of ethnic diversity's relation to individualism. Namely, that participants' endorsement of individualism in response to ethnic diversity contributes to participants' reports of greater satisfaction with life. This finding aligns with prior research which suggests that universities in Western cultures are built around individualistic norms, and that those with greater individualistic self-concepts may perform better academically in a University context (Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012). These results suggest that the

development of an individualistic self-concept in response to ethnic diversity may be one way to minimize struggles in universities for some students, and holds potential for increasing their well-being.

Study 5

Studies 3 and 4 demonstrated that the perception of greater ethnic diversity in one's environment predicts a greater likelihood of endorsing an individualistic self-construal, an effect that was statistically accounted for by greater interethnic contact. In both of these studies, these findings were driven by participants' report of greater interethnic contact. Moreover, Study 4 results suggested that participating in a classroom perceived to be greater in subjective ethnic diversity at the start of an academic term, contributed to a greater endorsement of individualism at the end of the term.

The primary goal of Study 5 was to extend these findings through an experimental design, manipulating participant's perceptions of the ethnic diversity in their social environments. This manipulation was attempted by varying the number of ethnically different others that a participant would recall in their social networks, and assessing how difficult it was for participants to recall diverse others in their social networks. Prior research on the availability heuristic suggests that difficulty in recalling instances of expressing behaviours (e.g., aggression) can contribute to lower ratings of that behaviour in oneself (e.g., Schwarz et al., 1991; see also Winkielman, Schwarz, & Belli, 1998). Building on these prior findings, I hypothesized that participants who are asked to recall more ethnically different others would have greater difficulty doing so, and thus lower the perceptions of ethnic diversity in their environment. This difficulty and perception of lower ethnic diversity around them should in turn contribute to a greater endorsement of individualism. Additionally, Study 5 sought to extend on previous studies by

including a measure of individualism that extends beyond self-construal, and was designed to assess the different component of individualism. Study 5 also included exploratory measures of open-mindedness in order to test the association between individualism and open-minded thinking.

Method

Participants. Based on effect sizes from previous studies, a G*power analysis suggested a total sample size of approximately 350 participants to achieve a statistical power of .80. I aimed to obtain 400 participants to account for exclusions. A total of 403 participants from Amazon's Mechanical Turk were recruited and compensated $1 USD for their participation. Following pre-registered exclusionary criteria, participants were excluded from analysis if their computer's IP address suggested they were not in the U.S., and when participants reported being more distracted than attentive to the study. The final sample size following exclusionary criteria was 355 participants. Full demographic information is presented in Table 6.

Procedure. Following similar procedures to that in Studies 3-4, participants began the study by reporting their demographic characteristics. Following report of their demographics, participants were informed that they would be asked to reflect on their social relationships and local community. Adapting a measure from Schwarz et al., (1991), participants were randomly assigned to try to recall up to 3 ethnically different others in the social network (low-recall; n = 178) or up to 12 ethnically different others (high-recall; n = 177)[7]. Participants were instructed

[7] The decision to choose 3 and 12 as the recall categories was determined through a pilot test at the end of unrelated study. In the pilot study, 351 MTurk participants were asked to recall up to 3, 6, or 12 ethnically diverse others in their social network. Participants recalled on average: 2.98 (*SD* = .14), 5.48 (*SD* = 1.24) and 8.49 (*SD* = 3.94), respectively. Upon completing the list, participants answered the question "How difficult was it for you to recall others whose ethnic background is different from your own?" on a scale from 1 (not at all difficult) to 7 (extremely difficult). From lowest recall condition to highest, participants reported an average of 2.22 (*SD* =

that they should "Think about your own personal social relationship—that is, the specific people in your community with whom you have direct personal connections, such as your friends, acquaintances, neighbors, and coworkers." Participants were then prompted with the following:

> Try to recall as many people among those social relationships whose ethnic background is different from your own. If you personally identify with multiple ethnic backgrounds, please think of people whose background is most different from yours. Please list up to [3 / 12] different people, providing the first name or initials of each person below.

Participants in the low-recall condition were then presented with 3 lines to list others, and participants in the high-recall condition were presented with 12 lines. On average, participants in the low-recall condition listed 2.94 others (*SD* = .28), and those in the high-recall condition listed 8.41 others (*SD* = 3.87). To encourage participants to reflect on their personal contact with ethnically different others, all participants were asked on the next page of the survey to "think about the last interaction you had with one of the people you listed". Participants were then instructed to spend a moment writing: "Reflecting on this interaction, please write down a few sentences about who this person is (e.g., their relationship to you), what you talked about, and any topic(s) you may have discussed." To assess recall difficulty, participants were asked upon completing their written responses, to rate "How difficult was it to recall others whose ethnic background is different than your own?" on a scale from 1 (not at all difficult) to 7 (extremely difficult). Participants then completed a series of measures in the order of the subsequent sections discussed below.

Demographics. As described in Study 3, participants completed demographic measures of their gender, political ideology, and social class at the start and end of the survey. Participants reported their political ideology in response to the question: "How would you describe your

1.63), 2.56 (*SD* = 1.67), and 3.39 (*SD* = 2.22). Three and 12 were decided upon to maximize the discrepancy in difficulty of recalling diverse others that participants would experience.

political leanings?" (M = 4.44, SD = 1.68). Participants also reported their social class group in response to the question: "With which social class group are you most identified with in terms of income and education?" (M = 2.72, SD = .87). The anchors and questions for social class and political ideology were identical to those in Study 3. Participant's median age was 35 years old. 199 participants identified as female, 152 identified as male, and four selected other as their gender. Participant's median social class identification was the middle class category, and their median political ideology was moderate.

Ethnic Diversity. Using identical procedures to that in Study 3 and 4, participants reported their perception of the proportion of different ethnic groups in their local community where they currently reside. Participants also provided the zip code of where they currently resided. Measures of objective and subjective ethnic diversity were computed through a computation of their ethnic fractionalization (EF) scores ($M_{objective}$ = .42, SD = .20; $M_{subjective}$ = .54, SD = .19). As described in Study 3, higher EF scores reflect greater ethnic diversity Objective and subjective EF were significantly positively correlated, r = .47, p < .001.

Individualism-Collectivism. Individualism and Collectivism was assessed through a 36-item scale (Oyserman, 1993; Oyserman et al., 2002). The scale was designed to assess three subcomponents of individualism: valuing personal uniqueness, valuing personal freedom/happiness, and valuing personal achievement. The list of items used to measure each subcomponent of individualism is available in Appendix E. The scale also included three subcomponents of collectivism: sense of common in-group fate, familialism, and interrelatedness. Participants rated each item on a scale from 1 (strongly disagree) to 7 (strongly agree). Overall, each of the six subcomponents of the scale hung together well: Valuing personal uniqueness (M = 5.54; SD = .99; α = .87); Valuing freedom/happiness (M = 5.38; SD = .88; α =

.71); Valuing personal achievement (M = 5.21; SD = 1.02; α = .81); Sense of common in-group fate (M = 3.98; SD = 1.43; α = .88); Familialism (M = 5.23; SD = 1.25; α = .90); Interrelatedness (M = 4.39; SD = 1.16; α = .80).

An overall composite of all of the individualism items was also computed (M = 5.37; SD = .85; α = .91), as well as a composite for all of the collectivism items (M = 4.57; SD = 1.06; α = .92). The individualism and collectivism composite measures were significantly correlated with each other, r = .21, p < .001. Because the two constructs are theoretically considered orthogonal to one another (Gelfand et al., 1996; Coon & Kemmelmeier, 2001; or unipolar Komarraju & Cokley, 2008), the significant positive correlation suggested potential common-method variance (e.g., acquiescence bias). To control for common-method variance, I regressed the individualism composite measure on the collectivism composite, β = .243, t(353) = 3.94, p < .001, saving the unstandardized residuals as a measure of Individualism. I also regressed the collectivism composite measure on the individualism composite, saving the unstandardized residuals as a measure of collectivism. The same process was repeated to compute residual scores for each of the six subcomponents, regressing each subcomponent on the opposing construct's overall composite measure (e.g., the valuing uniqueness subcomponent on the overall composite measure of collectivism). In accordance with my hypotheses, the primary focus of analyses will be on the residualized measure of individualism and its corresponding subcomponents.

Open-mindedness. Participants were assessed on three forms of open-mindedness. First, participants completed a 4-item measure of their openness to diverse values (OTDV; e.g., "I enjoy having discussions with people whose ideas and values are different from my own"; adopted from Barkley, Boone, & Holloway, 2005). Participants then completed a 15-item measure of active open-minded thinking (AOT; e.g., "People should search actively for reasons

why their beliefs might be wrong;" adapted from Stanovich & West, 1999). Participants rated their agreement with each item on a scale from 1 (strongly disagree) to 7 (strongly agree), Appendix F lists all the items from these measures. Items from both scales hung together well, thus an average score was computed for each scale (OTDV: $M = 5.34$, $SD = 1.16$, $\alpha = .88$; AOT: $M = 4.82$, $SD = .80$, $\alpha = .81$).

The third measure of open-mindedness involved an assessment of wise reasoning (WR; Grossmann, 2017) as a means of capturing the manifestation of open-mindedness in response to social situations[8]. The procedure for assessing WR was adapted from Brienza, Kung, Santos, Bobocel, & Grossmann (2017). Participants were first instructed to think about a difficult situation that has happened to them with another person. They were then asked to write down who the relationship was with, and to describe the kinds of problems and difficulties they were having with this person. On a subsequent page, participants were prompted with the following: "Recall the extent to which you engaged in the following thoughts and behaviors -- what you actually did as the situation unfolded. None of the statements listed below are supposed to be good or bad. We are simply interested in how people approach difficult situations." Participants were presented with 21 thought and behavior statements aimed at assessing how they reasoned over the situation they recalled. For each of the statements, participants rated on a scale from 1 (not at all) to 5 (very much), the degree to which they engaged in that thought or behavior (see Brienza et al., 2017 for a full list of items). The scale was designed to assess 5 subcomponents of WR: i. Taking others' perspective ($M = 3.34$, $SD = 1.02$, $\alpha = .87$); ii. Consideration of change ($M = 3.54$, $SD = .96$, $\alpha = .85$); iii. Intellectual humility ($M = 3.23$, $SD = 1.02$, $\alpha = .81$); iv. Search for

[8] Recent psychological perspectives on wisdom consider open-mindedness to be a central component of the wise reasoning construct (e.g., intellectual humility, openness to diverse perspectives; see Grossmann, 2017).

compromise (*M* = 3.64, *SD* = .92, α = .85); and v. Acknowledging outsider perspectives (*M* = 3.19, *SD* = 1.22, α = .92). To focus specifically on the components of open-mindedness, analyses will focus on the three subcomponents related to open-mindedness: taking others' perspective, intellectual humility, and acknowledging outsider perspectives. A composite score for open-minded WR was also computed by averaging the three open-minded subcomponents together (*M* = 3.25, *SD* = .91, α = .78)

Interethnic contact and Interethnic anxiety. Interethnic contact and interethnic anxiety were assessed with identical procedures to that described in Study 3. Both scales hung together well: Interethnic contact (*M* = 4.74, *SD* = 1.59, α = .90); Interethnic anxiety (*M* = 2.70, *SD* = 1.17, α = .89).

Study 5 Results

Participant's gender and self-identified social class were not significantly associated with their endorsement of individualism, *p*s > .758. However, political liberalism was marginally associated with greater individualism, β = -.09, *t*(353) = 1.75, *p* = .081. There were no gender differences in the endorsement of collectivism items, *F*(1, 353) = 12.18, *p* = .140. Participants with higher levels of self-reported social class were marginally more likely to endorse collectivist values, β = .10, *t*(353) = 1.90, *p* = .058. Political liberalism was associated with a greater endorsement of collectivism, such that those who identified as more conservative expressed a greater endorsement of collectivism, β = -.17, *t*(353) = -3.15, *p* = .002. The association between political ideology and cultural values is consistent with prior research on the relationship between political liberalism and reasoning tendencies, suggesting that political liberals are less likely to endorse collectivistic values (see Talhelm et al., 2015). Because my hypotheses chiefly concern individualism, and I did not have apriori hypotheses related to these

effects, I did not probe these results further. Condition did not significantly predict how much participants had written about their last interaction with an ethnically different other, $F(1, 353) < 1.00$, $p = .701$. On average, participants wrote 37.71 words ($SD = 21.97$). As predicted, participants in the high-recall condition reported significantly greater difficulty recalling ethnically different others ($M = 3.24$, $SD = 2.00$) than those in the low-recall condition ($M = 2.68$, $SD = 1.82$), $F(1, 353) = 7.68$, $p = .006$.

Individualism-Collectivism. Condition did not significantly predict individualism, $F(1, 353) = 1.51$, $p = .220$. $\eta_p^2 = .004$. However, difficulty of recalling ethnically diverse others significantly predicted the endorsement of the individualism measure, $\beta = -.17$, $t(353) = -3.17$, $p = .002$, such that the less difficulty participants had recalling ethnically different others, the more they endorsed individualism. Condition did not significantly interact with recall difficulty to predict individualism, $F < 1.00$, $p = .710$, however, condition became marginally significant when recall difficulty was included in the model, $F(1, 353) = 2.97$, $p = .086$, $\eta_p^2 = .008$, revealing that participants in the high-recall condition, reported a marginally greater endorsement of individualism ($M = .08$, $SE = .06$), compared to those in the low-recall condition ($M = -.07$, $SE = .06$). These results demonstrate that when controlling for participant's individual difficulty in recalling ethnically different others, the act of recalling a greater number of ethnically different others increased one's tendency to endorse individualism. Research on the availability heuristic suggests that recall difficulty and the content being recalled offer two distinctive pieces of information (Schwarz & Vaughn, 2002) and may under different contexts, create conflicting results (e.g., Wanke, Schwarz, & Bless, 1995). For example, recalling a large number of ethnically different others may be difficult for some people, making people feel that their networks are less diverse. However, recalling a large number of ethnically different others also

brings up a larger number of diverse others in one's social network, which may make people feel a greater sense of ethnic diversity in their social network. As these results suggest, controlling for difficulty of recall demonstrates that the *content* being recalled—i.e., a greater number of diverse others in the high-recall condition, contributed to participant's endorsing marginally greater levels of individualism. Difficulty of recall retained its significance when controlling for condition, $F(1, 353) = 11.20$, $p = .001$, $\eta_p^2 = .031$.

Testing my hypothesis that recalling a larger number of ethnically different others in one's social network would be associated with more recall difficulty (thus increasing the perception that one's social network may not be as ethnically diverse), and result in a lower endorsement of individualistic self-construal, I tested a mediation model specified in Figure 6. The mediation pathway was significant, 95% CI [-.10, -.01] because 0 did not fall between the 5000 bootstrapped sample confidence intervals (Preacher & Hayes, 2004). As depicted in Figure 6, participants in the high-recall condition reported greater difficulty in recall, and greater difficulty of recall of ethnically different others was negatively associated with an increase in the endorsement of individualistic self-construal.

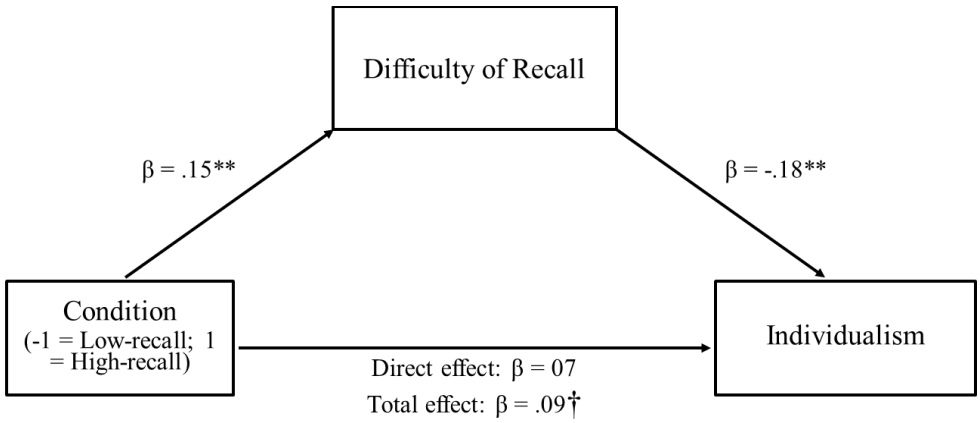

Figure 6. Mediation of difficulty of recalling ethnically different others on the relationship between participant's condition and individualism (Study 5). High-recall indicates participants asked to recall up to 12 ethnically different others, and low-recall indicates participants asked to recall up to 3 ethnically different others.
†$p < .10$; $^{**}p<.01$;

Condition marginally predicted the valuing freedom/happiness subcomponent of individualism, such that participants in the high-recall condition reported marginally greater endorsement of valuing freedom/happiness ($M = .09$, $SE = .07$), compared to those in the low-recall condition ($M = -.09$, $SE = .07$), $F(1, 353) = 3.52$, $p = .061$, $\eta_p^2 = .010$.When controlling for difficulty of recall, condition significantly predicted the valuing freedom/happiness subcomponent, $F(1, 353) = 5.76$, $p = .017$, $\eta_p^2 = .016$. Greater difficulty of recall was significantly negatively related to all the subcomponents with and without condition in the model, ps $< .011$. Condition did not significantly predict collectivism, nor any of its subcomponents, Fs < 1.00, ps $> .728$. Difficulty of recall also did not predict collectivism, with or without condition in the model, ps $> .231$. The descriptives and zero-order correlations between the individualism and other measurements in Study 5 are presented in Table 9.

Table 9

Zero-Order Correlations between scales assessed in Studies 5-6

Measures	1	2	3	4	5
1. Individualism	–	-.21***	.33***	.20***	.13*
2. Collectivism	-.32***	–	.09†	-.28***	.23***
3. Openness to diverse values	.28***	.08	–	.38***	.32***
4. Actively open minded thinking	.14*	-.40***	.28***	–	.11*
5. Wise reasoning	.14**	.12*	.25***	.12*	–

Note. Study 5 correlations are above the diagonal. Study 6 correlations are below the diagonal. Individualism and collectivism reflect the saved unstandardized residuals when regressing each on the other measure. Wise reasoning reflects the average score across the three open-mindedness subcomponents.
†$p < .10$; $^{*}p<.05$; $^{**}p<.01$; $^{***}p<.001$

Ethnic Diversity. Condition did not significantly predict participant's perceptions of

ethnic diversity in their community (i.e., their subjective ethnic fractionalization measure), $F(1, 353) < 1.00$, $p = .843$. However, participants reporting greater subjective EF in their communities reported less difficulty recalling ethnically different others in their interpersonal networks, $\beta = -.13$, $t(353) = -2.41$, $p = .017$. Similarly, participants objective ethnic diversity (i.e., their objective EF computed through their zip codes) significantly predicted participant's report of recall difficulty, $\beta = -.12$, $t(353) = -2.31$, $p = .022$, such that participants with greater objective EF scores reported less difficulty recalling ethnically different others. Participant's subjective and objective ethnic diversity indicators were not significantly related to their endorsement of individualism, rs = .07-.09, $p > .11$, or collectivism, $|r|$s = .02-.04, ps > .401. As presented in Table 10, the association between EF measures and individualism were significant for the valuing personal achievement subcomponent.

Table 10

Zero-order correlations between subjective and objective EF measures on subcomponents of Individualism-Collectivism (Studies 5-6)

	Study 5		Study 6	
Individualism-collectivism subcomponents	Subjective EF	Objective EF	Subjective EF	Objective EF
Valuing personal uniqueness(I)	.05	.03	.02	-.006
Valuing freedom/happiness(I)	.04	.04	.03	.003
Valuing personal achievement(I)	.13*	.11*	.14**	.02
Sense of common in-group fate(C)	.09†	-.006	.04	.09†
Familialism(C)	-.01	-.04	.009	-.12*
Interrelatedness(C)	.04	.006	-.001	.008

Note. EF = Ethnic fractionalization index. (I) = Individualism-related subcomponent. (C) = Collectivism-related subcomponent. Subcomponent measures reflect the residualized scores when regressing each subcomponent on the composite measure of the opposing construct.
†$p < .10$; *$p<.05$; **$p<.01$

Interethnic contact and Interethnic anxiety. Interethnic contact and interethnic anxiety were significantly negatively correlated, $r = -.47$, $p < .001$. Participants with greater subjective EF scores were significantly more likely to report greater interethnic contact, $r = .31$, $p < .001$, but not interethnic anxiety, $r = -.04$, $p = .449$. Similarly, objective EF was significantly positively

related to interethnic contact, $r = .25$, $p < .001$, but not interethnic anxiety, $r = -.08$, $p = .145$. Those who reported greater interethnic contact were significantly more likely to endorse individualism, $r = .21$, $p < .001$, but not collectivism, $r = .04$, $p = .455$. The association between interethnic contact and the three individualism subcomponents was consistent in direction and significance with the overall composite measure, *r*'s range = .13-.22, *ps* < .011.

Participants reporting greater interethnic anxiety were significantly less likely to endorse individualism, $r = -.32$, $p < .001$, and significantly more likely to endorse collectivism, $r = .19$, $p < .001$. The association between interethnic anxiety and individualism was significant for all subcomponents, |*r*s| range = .23-.35, *p*s < .001. The association between interethnic anxiety and collectivism was significantly positively related to the in-group fate subcomponent, $r = .24$, $p < .001$, and interrelatedness subcomponent, $r = .25$, $p < .001$, but not the familialism subcomponent, $r = -.001$, $p = .979$.

Following procedures outlined in Study 3, I assessed whether interethnic contact significantly mediated the association between ethnic diversity and the endorsement of individualism. The mediation was significant for subjective EF, 95%CI [.13, .49], suggesting that greater reports of subjective EF predicted greater interethnic contact, which in turn predicted the greater endorsement of individualism. This path was also significant when interchanging subjective EF with objective EF, 95%CI [.09, .36]. Interchanging interethnic contact with interethnic anxiety was not significant for either subjective EF, 95%CI [-.09, .23] or objective EF, 95%CI [-.04, .25].

As with Study 3, I also tested the serial pathway of interethnic contact and interethnic anxiety using the path model: Subjective EF ➔ Interethnic contact ➔ Interethnic anxiety ➔ Individualism). This pathway as depicted in Appendix D, was significant, 95%CI [.12, .33].

Interchanging subjective EF with objective EF in the pathway model was also significant, 95%CI [.08, .24] whereas the serial pathway interchanging interethnic contact and interethnic anxiety was not significant, $95\%CI_{subjective}$ [-.006, .04], $95\%CI_{objective}$ [-.004, .05].

Open-mindedness. All three measures of open-mindedness, openness to diverse values, actively open-minded thinking, and wise reasoning, were significantly positively related to each other, *r*s = .32-.38, *p*s < .001. Condition did predict any of the open-mindedness measures, *F*s < 1.09, *p*s > .297. As presented in Table 11, participants with greater subjective EF scores were more likely to endorse openness to diverse values, and wise reasoning. Those reporting greater interethnic contact were also more likely to endorse all three open-mindedness measures.

Table 11
Zero-order correlations between open-mindedness and variables assessed (Studies 5-6)

	Study 5			Study 6		
Measures	OTDV	AOT	WR	OTDV	AOT	WR
Subjective EF	.09†	-.07	.12*	.11*	.04	.006
Objective EF	.12*	.07	.001	-.004	.01	-.03
Interethnic contact	.36***	.12*	.23***	.34***	.18**	.17**
Interethnic anxiety	-.29***	-.37***	-.04	-.27***	-.36***	-.09

Note. EF = ethnic fractionalization; OTDV = Openness to Diverse values; AOT = Actively Open-minded Thinking; WR = Wise reasoning.
†$p < .10$; $^{*}p<.05$; $^{**}p<.01$; $^{***}p<.001$

As shown previously in Table 9, participants endorsing greater individualism were significantly more likely to endorse the three measures of open-mindedness, $r_{ind\text{-}OTDV} = .33$, $p < .001$; $r_{ind\text{-}AOT}$, = .20, $p < .001$; $r_{ind\text{-}WR} = .13$, $p = .017$. To assess whether greater individualism has downstream consequences on open-mindedness, I assess the following serial path model: Subjective EF➔ Interethnic contact ➔ Individualism ➔ Open-mindedness. I tested this path for the three measures of open-mindedness. The indirect effects of Subjective EF on OTDV and AOT were significant, $95\%CI_{OTDV}$ [.05, .21], $95\%CI_{AOT}$ [.02, .11], but WR was not, 95%CI [-.008, .07]. Although these results support that open-mindedness may be an outcome of

individualism, interchanging OTDV and AOT with individualism in the model also lead to statistically significant pathways, 95%CI_{OTDV} [.08, .27], 95%CI_{AOT} [.01, .09], suggesting that individualism could be an outcome of open-mindedness. Consideration of these different interpretations is discussed in the future directions portion of the general discussion.

Study 5 Discussion

Results from Study 5 replicated the pattern of results from Studies 3 and 4, demonstrating that participant's subjective perceptions of the ethnic diversity contributed to a greater endorsement of individualism. Converging with results from Studies 3 and 4, the association between ethnic diversity and individualism was statistically mediated by reports of interethnic contact, but not interethnic anxiety when tested separately. Test of the serial path models with interethnic contact and interethnic anxiety in succession also replicated in Study 5. Utilizing a different measure of self-construal, Study 5 results offer insight into what subcomponents of individualism may be most influenced by ethnic diversity. Through assessment of the subcomponents of individualism, valuing personal achievement—i.e., greater valuation of one's personal goals, accomplishments, and hard work—emerged as the driving force behind the association between increased perceptions of ethnic diversity in one's environment and greater individualism.

As hypothesized, participants in the high-recall condition expressed greater difficulty in trying to recall ethnically different others, which in turn reduced their endorsement of individualism. An alternative framing is that those in the low-recall condition who recalled a fewer number of ethnically different others, reported less difficulty doing so. This ease, arguably making their social networks feel more diverse, was positively associated with the endorsement of individualism. Notably however, the condition manipulation and difficulty of recall did not

predict participant's actual reports of subjective ethnic diversity in their environments. Study 5 also introduced exploratory measures of open-mindedness as a potential downstream consequence of individualism. A path model testing indirect effects of subjective perception of ethnic diversity in the community on open-mindedness via individualism supports the notion that open-mindedness may be an outcome of individualism. This indirect effect appeared bidirectional, such that open-mindedness may also promote greater individualism.

Overall, Study 5 offers further support for the association between ethnic diversity and individualism. Results from analyses of the subcomponents of individualism suggest that ethnic diversity may lead to people placing a greater emphasis on personal achievement as one of the ways in which it can promote greater individualism. Moreover, the manipulation of recall used in Study 5 suggests that perceptions of ethnic diversity in one's environments may be able to impact one's endorsement of individualism. Although condition and difficulty of recall did not predict participant's subjective EF scores, it is possible that manipulating recall was able to shift participants' perceptions of diversity in their social networks, but not their broader perceptions of diversity in their local community. Unfortunately, this possibility was not assessed. In addition to supporting prior findings, Study 5 also highlights that open-mindedness may play a role in the association between ethnic diversity and individualism. However, further research is needed to directly test a causal association between these variables.

Study 6

Study 5 demonstrated that greater ease of recalling diverse others in one's interpersonal network can contribute to a greater endorsement of individualism. In Study 6, I follow this up by attempting to manipulate participant's exposure to ethnic diversity at the interpersonal level, asking participants to imagine interacting with someone who is ethnically different from them or

not. To test the replicability of previous findings, Study 6 included the measures of individualism-collectivism and open-mindedness measures used in Study 5.

Method

Participants. Based on effect sizes from previous studies, a G*power analysis suggested a total sample size of approximately 350 participants to achieve a statistical power of .80. We aimed to obtain as 400 participants to account for exclusions. Four hundred and eight participants from Amazon's Mechanical Turk were recruited and compensated $1 USD for their participation. Following pre-registered exclusionary criteria and procedures outlined in Studies 3-5, participants were excluded from analysis if their IP location suggested they were not in the U.S. and if they reported being more distracted than attentive to the study. The final sample size following exclusionary criteria was 352 participants. Full demographic information is presented in Table 1.

Procedure. Following similar procedures to that in Studies 3-5, participants began the study by reporting their demographic characteristics. Following their demographics, participants were informed that they would be asked to imagine themselves interacting with a person in their community. Participants were then presented with the prompt adapted from Turner, Crisp, and Lambert (2007) involving imagining interethnic contact. Participants were randomly assigned to imagine interacting with a gender-matched other who was from the same (n = 182) or different (n = 170) ethnic background than their own. Specifically, participants were told that they should "take a minute to imagine yourself meeting a person for the first time. The following is a description of the individual:"

> This person lives in your local community, and is a [male/female] who is roughly the same age as you. This person is from [the same/ a different] ethnic background than your own.

Participants were then asked to "take a moment to imagine this person. Think about their appearance, a conversation you might have, and the setting for where you might be. To encourage participants to immerse themselves in the imagined interaction, participants were asked to "Describe in a few sentences the scene that you imagined yourself in. Where were you? What type of conversation did you have?" Upon completing their written response, participants completed measures of their cultural values, perceived ethnic diversity, reasoning tendencies, followed by final demographics identical to that in Studies 3-5.

Demographics. Following procedures from Studies 3 and 5, participants completed demographic measures at the start and end of the survey. Questions and anchors were identical to those in Studies 3 and 5. Participant's median age was 34 years old. Two hundred and twenty-two participants identified as female, 128 identified as male, and two selected other as their gender. Participant's median social class identification was the middle class category (M = 2.66, SD = .97) and moderate on their political leanings measure (M = 4.40, SD = 1.81).

Individualism-Collectivism . Individualism and Collectivism was assessed through the identical scale utilized in Study 5, see Appendix D. Overall, the six subcomponents of the scale hung together well: Valuing personal uniqueness (M = 5.56; SD = .96; α = .84); Valuing freedom/happiness (M = 5.39; SD = .92; α = .73); Valuing personal achievement (M = 5.22; SD = 1.04; α = .82); Sense of common in-group fate (M = 3.78; SD = 1.57; α = .90); Familialism (M = 5.32; SD = 1.27; α = .90); Interrelatedness (M = 4.42; SD = 1.14; α = .78). Following Study 5, an overall composite of the individualism items was also computed (M = 5.39; SD = .82; α = .90), as well as a composite for the collectivism items (M = 4.55; SD = 1.11; α = .92). The individualism and collectivism composite measures were significantly correlated, r = .32, p < .001.

Following procedures outlined in Study 5, individualism was assessed by regressing the individualism composite on the collectivism composite, saving the unstandardized residuals as a measure of individualism. Collectivism was assessed by saving the unstandardized residuals when regressing the collectivism composite on the individualism composite measure. As detailed in Study 5, the same procedure was conducted for each of the three subcomponents within individualism and collectivism. The primary focus of my analyses will be on the residualized measure of individualism.

Measures of Ethnic Diversity. Measurements of ethnic diversity were identical to procedures outlined in Studies 3-5. Measurements of both objective and subjective ethnic diversity was computed using measures of ethnic fractionalization ($M_{objective}$ = .41, *SD* = .20; $M_{subjective}$ = .49, *SD* = .23). Objective and subjective ethnic diversity were significantly positively correlated, $r = .46$, $p < .001$.

Open-mindedness. Participants were assessed on the three forms of open-mindedness that were assessed in Study 5: Openness to diverse values (*M* = 5.47, *SD* = 1.14, α = .86) actively open-minded thinking (*M* = 4.91, *SD* = .81, α = .80), and open-minded wise reasoning. As described in Study 5, wise reasoning consisted of three open-minded subcomponents: i. taking others' perspective (*M* = 3.52, *SD* = 1.03, α = .86); ii. intellectual humility (*M* = 3.34, *SD* = 1.04, α = .83) and iii. taking outsider viewpoints into consideration (*M* = 3.30, *SD* = 1.22, α = .91). An average score of the three subcomponents was computed as a measure of open-minded wise reasoning (*M* = 3.38, *SD* = .89, α = .73).

Interethnic Contact and Interethnic Anxiety. Measurements of interethnic contact and interethnic anxiety were collected using the measures outlined in Studies 3-5. A mean score was computed for interethnic contact (*M* = 4.65, *SD* = 1.58, α = .87) and interethnic anxiety (*M* =

2.70, *SD* = 1.14, α = .87). Interethnic contact and interethnic anxiety were significantly negatively correlated, $r = -.42$, $p < .001$.

Study 6 Results

Participant's gender and self-identified social class did not significantly relate to their endorsement of individualism, *p*s > .168. Political ideology however, was marginally positively related to individualism, β = .09, $t(350) = 1.76$, $p = .080$, suggesting that those who identified as liberal tended to endorse greater individualism. Gender, political ideology, and social class each predicted the endorsement of collectivism. Females (*M* = .16, *SD* = .07) were more likely to endorse collectivism than males (*M* = -.24, *SD* = .09), $F(1, 348) = 12.03$, $p = .001$,$\eta_p^2 = .033$. Those who identified as more conservative were more likely to endorse collectivism items, β = -.35, $t(350) = -7.01$, $p < .001$, and those who identified as higher in social class reported a greater endorsement of collectivism, β = .18, $t(350) = 3.37$, $p = .001$. Condition significantly predicted the amount of words written, with participants in the non-diverse condition writing more words describing their interaction (*M* = 48.54, *SD* = 32.02) than those in the diverse condition (*M* = 42.36, *SD* = 24.32), $F(1, 350) = 4.12$, $p = .043$, $\eta_p^2 = .012$. However, word count did not predict any of the cultural value measures, |*r*s| = .010-.09, *p*s > .091, or open-mindedness measures, |*r*s| = .001-.08, *p*s > .157.

Individualism-Collectivism. There was a significant main effect of condition on individualism, $F(1, 350) = 4.73$, $p = .030$, $\eta_p^2 = .013$, revealing that participants imagining interacting with a person from a different ethnic background tended to endorse greater individualism (*M* = .09, *SE* = .06) compared to those imagining interacting with someone from the same ethnic background (*M* = -.09, *SE* = .06). Condition did not significantly predict participant's endorsement of collectivism, $F(1, 350) < 1.00$, $p = .525$. Figure 7 depicts the means

of the three individualism subcomponents as a function of condition. Of the three subcomponents, there was a significant effect of condition on valuing uniqueness, $F(1, 350) = 4.56$, $p = .033$, $\eta_p^2 = .013$, a marginal effect condition on valuing freedom/happiness, $F(1, 350) = 3.70$, $p = .055$, $\eta_p^2 = .010$ and no effect of condition on personal achievement, $F(1, 350) = 1.93$, $p = .165$. In both the valuing uniqueness and valuing freedom and happiness subcomponents, participants in the different ethnic background condition reported a greater endorsement of individualism.

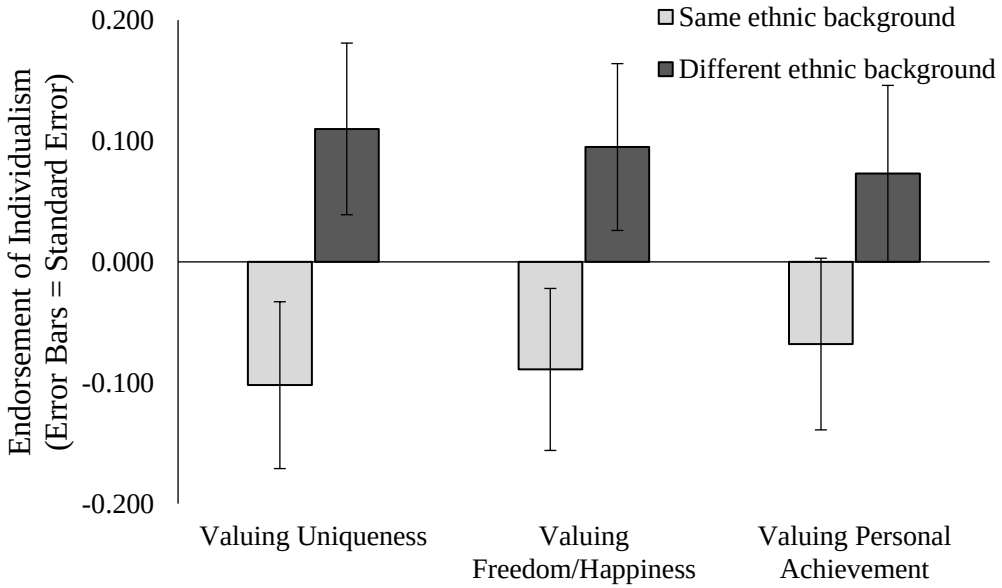

Figure 7. Mean endorsement of individualism subcomponent measures as a function of condition (Study 6). Error bars represent standard error. Scores reflect the unstandardized residuals of each subcomponent when residualizing out the mean value of the collectivism composite measure.

Ethnic Diversity. Participant's perceptions of ethnic diversity—i.e., their subjective EF measure, was not significantly associated with their endorsement of individualism, $r = .08$, $p = .137$. Perceptions of ethnic diversity also did not predict collectivism, $r = .02$, $p = .683$. As shown in Table 10, subjective perceptions of diversity were positively related to greater valuation of personal achievement, $r = .14$, $p = .008$, but neither of the other subcomponents of

individualism. Objective EF scores were not significantly correlated with either individualism or collectivism, *p*s > .885.

Interethnic contact and Interethnic anxiety. Condition did not predict participant's reports of interethnic contact, $F(1, 350) < 1.00$, $p = .552$, or interethnic anxiety, $F(1, 350) < 1.00$, $p = .884$. Participants reporting greater perceptions of ethnic diversity in their environment reported greater interethnic contact, $r = .24$, $p < .001$, but not interethnic anxiety, $r = -.09$, $p = .104$. Similarly, participants with greater objective EF scores were more likely to report greater interethnic contact, $r = .30$, $p < .001$, but not interethnic anxiety, $r = -.02$, $p = .700$. Participants reporting greater interethnic contact were more likely to endorse individualism, $r = .28$, $p < .001$. This association was consistent across the three individualism subcomponents, *r*'s range = .20-.28, *ps* < .001. Interethnic contact was marginally related to collectivism, $r = -.10$, $p = .056$. Participants reporting greater interethnic anxiety were less likely to endorse individualism, $r = -.21$, $p < .001$, and more likely to endorse collectivism, $r = .26$, $p < .001$. The negative association between interethnic anxiety and individualism was consistent in direction for all subcomponents of individualism, |*r*s| = .10-.22.

Following procedures from Study 3-5, I assessed whether interethnic contact and interethnic anxiety mediated the association between ethnic diversity and individualism. A test of the mediation of interethnic contact on the association between subjective EF and individualism was significant, 95%CI [.11, 37]. It was also significant for objective EF, 95%CI [.19, .55]. Replacing interethnic contact with interethnic anxiety in the pathway was not significant for either subjective EF, 95%CI [-.005, .16] or objective EF 95%CI [-.07, .11]. These patterns replicate findings from Studies 3-5, suggesting that greater ethnic diversity contributes to reports of greater interethnic contact, which in turn promotes individualism. In line with Studies 3-5, I

also tested the serial pathway model of interethnic contact and interethnic anxiety on the association between subjective EF and the individualism composite measure. This pathway, depicted in Appendix C, was significant for subjective EF, 95%CI [.001, .09], but not objective EF, 95%CI [-.002, .13].

Open-mindedness. All measures of open-mindedness, openness to diverse values, actively open-minded thinking, and wise reasoning were significantly positively related to each other, $|rs| = .12\text{-}.28$, $ps < .027$. Condition did not predict any of the open-mindedness measures, $ps > .304$. Consistent with Study 5, participants reporting greater subjective EF reported greater OTDV, $r = .11$, $p = .038$, but not AOT, $r = .04$, $p = .496$. Unlike Study 5 however, subjective ethnic diversity was not related to WR, $r = .006$, $p = .910$.

The more participants endorsed individualism, the more they agreed with OTDV statements, $r = .28$, $p < .001$, AOT, $r = .14$, $p = .011$, and WR, $r = .14$, $p = .007$. As presented in Table 11, participants reporting greater interethnic contact scored higher on all open-mindedness measures, $|rs| = .17\text{-}.34$, $ps < .001$. Participants reporting greater interethnic anxiety scored lower on the OTDV, $r = -.27$, $p < .001$, and AOT, $r = -.36$, $p < .001$, measures, and revealed a similar but non-significant association with WR, $r = -.09$, $p = .113$.

To assess whether the effect of condition on individualism predicted effects on open-mindedness, I tested the mediation pathway of Condition ➔ Individualism ➔ Open-mindedness, for all three measures of open-mindedness. This pathway model was significant for all measures of open-mindedness: $95\%CI_{OTDV}$ [.005, .09], $95\%CI_{AOT}$ [.001, .04], $95\%CI_{WR}$ [.008, .04]. Interchanging individualism and open-mindedness in the pathway model was not significant for any of the measures of open-mindedness: $95\%CI_{OTDV}$ [-.008, .04], $95\%CI_{AOT}$ [-.02, .006], $95\%CI_{WR}$ [-.02, .005].

I also tested the following serial pathways tested in Study 5: Subjective EF ➔ Interethnic contact ➔ Individualism ➔ Open-mindedness, for all three measures of open mindedness. The results from these tests were significant for openness to diverse values, 95% CI [.02, .15] and open-minded wise reasoning, 95%CI [.0009, .07], but not active open-minded thinking, 95%CI [-.002, .06]. Interchanging individualism and the open-minded measures in the pathway was also significant for openness to diverse values, 95%CI [.01, .13] and open-minded wise reasoning, 95%CI [.0003, .02], leaving ambiguity in whether individualism or open-mindedness precedes the other.

Study 6 Discussion

Results from Study 6 suggests that one may be able to shift the endorsement of individualism through a manipulation of interethnic contact, finding that participants imagining interacting with an ethnically different person endorsed greater individualism, compared to those imagining interacting with someone from their own ethnic background. This effect was largest in the valuation of uniqueness subcomponent of individualism, suggesting that the process of interacting with ethnically diverse others may be affecting individualism through the recognition and valuation of uniqueness in oneself. Converging with results from Study 5, perceptions of ethnic diversity in the community was associated with a greater endorsement of individualism, and had its largest effect on the personal achievement subcomponent of individualism. The differential impact of the manipulation and subjective perception of ethnic diversity on different subcomponents of individualism suggest that ethnic diversity can influence individualism in multiple different ways. The findings suggest that everyday interethnic contact may shape one's individualistic values of uniqueness, while broader level perceptions of greater ethnic diversity in our environment can promote individualism by shifting one's focus toward their own goals and

achievements.

Results from Study 6 continued to demonstrate the pattern of results observed in Studies 3-5. Dovetailing with results from Studies 3-5, the association between subjective perceptions of ethnic diversity and individualism was in part statistically accounted for by greater interethnic contact, but not interethnic anxiety. Study 6 also offers further evidence for the role of open-mindedness as a potential consequence of greater individualism. Specifically, Study 6 replicated results from Study 5 suggesting that openness to diverse values is associated with a greater endorsement of individualism, an outcome from both the manipulation of interethnic contact on individualism, and the effect of subjective perceptions of ethnic diversity on individualism.

General Discussion

Across six studies, the present research suggests that greater levels of ethnic diversity in one's environment predicts greater individualistic cultural values and behaviour. In Studies 1-2, levels of ethnic diversity over the past decades across the U.S. and within each U.S. state predicted greater individualistic interpersonal structure and cultural practices. Specifically, results suggested that the levels of ethnic diversity present in society over the past half century were positively associated with the level of individualistic interpersonal structure (e.g., rates of living alone, smaller family sizes), and the practice of distinctive baby naming. At the individual-level, Studies 3-6 demonstrated that greater perceptions of ethnic diversity in one's environment were associated with an increased endorsement of individualistic values (e.g., an independent self-construal, valuing uniqueness), an effect that was accounted for by greater interethnic contact. Reports of interethnic anxiety in Studies 3-6 were negatively associated with the endorsement of individualism. Study 4 results suggested the higher perceptions of ethnic diversity in one's environment was associated with an increased endorsement of individualistic

self-construal a few months later. Study 5 suggested that the easier it was for participants to recall ethnically different others, the more they endorsed individualism. Study 6 demonstrated that imagining interacting with ethnically different (vs. same) others increased one's endorsement of individualism. In addition to all of these reported findings, Studies 4-6 also offered insight into the affective and cognitive processes accompanying the ethnic diversity and individualism link, showing that the increased individualism in response to greater ethnic diversity was associated with increased reports of subjective well-being and increased reports of open-mindedness.

Together, the studies presented in this dissertation offer a first look at the cultural consequences of increasing ethnic diversity in our environments. Cultural development theorists have long purported that societal cultural orientations develop as an ongoing interaction between the elements within ecological systems (e.g., institutions and individuals within them; Markus & Kitayama, 2010; Varnum & Grossmann, 2017). With ethnic diversity increasing at an exponential rate over the past decades, these results support these prior cultural development theorists, revealing that as ethnic diversity—an evolving element within our socio-ecological system—changes, so do the cultural systems that constitute the system.

Given the breadth of information in cultural psychology on the implications of individualism (Li, 2002; Hofstede, 1985; Markus & Kitayama, 1991, 2010; Triandis, Bontempo, Villareal, Asai & Lucca, 1988; Triandis, 1995), the present research provides a means for academics, policy makers, and organizations to anticipate how people will respond to the projected increasing rates of ethnic diversity. The information obtained through these studies suggest that increases in ethnic diversity are going to be accompanied by an increasing societal emphasis on constructs promoted by individualism—such as individual autonomy, greater

preference for uniqueness, and greater voicing of individual rights (Oyserman et al., 2002; Triandis & Gelfand, 2012). In addition to offering these broad implications, the findings obtained from this dissertation also offer several theoretical and practical implications for the research literatures from which these findings were derived.

Implications for the Intergroup Relations Literature

The findings that ethnic diversity can shape cultural social orientation offers unique insight into the vast and well-studied area of intergroup relations. Namely, it provides a cultural perspective on the implications of intergroup interactions, demonstrating how these interactions may shape one's own cultural values and self-construal. Previous theoretical frameworks on the consequences of ethnic diversity in the intergroup relations literature have predominately focused on the perceptions of threat and impact on prejudicial attitudes (see Craig & Richeson, 2014a for example), and less so on how changes in one's cultural orientation may feedback into the system to shape those outcomes. The work presented in this dissertation focuses on this missing component and paves the way for future research to focus in on integrating these components, offering a more comprehensive framework for understanding the consequences of intergroup relations.

In addition to providing a differing approach to understanding the consequences of ethnic diversity, the present research also provides supporting evidence for the predictions made by social psychological theories such as *contact theory* and *conflict theory*. Contact theory for example, posits that interethnic contact should be associated with lower rates of interethnic anxiety, so long as the contact is positive (Pettigrew, 1998). Results from Studies 3-6 in this dissertation support these findings, finding a consistent association between reports of greater interethnic contact and lower ratings of interethnic anxiety. In contrast, conflict theory suggests

that increased ethnic diversity can be threatening, contributing to greater prejudicial attitudes and biases from majority group members toward minority groups (Craig & Richeson, 2017a). For instance, research on White's perceptions of increasing ethnic diversity suggest that it increased their ratings of threat to their group's status, resulting in greater explicit and implicit biases toward ethnic minority members (Craig & Richeson, 2017a, 2017b; see also Zou & Cheryan, 2017). Research that stems from these findings suggest a tendency for majority group members to prefer withdrawing from their communities (e.g. "White Flight", Zou & Cheryan, in prep). Findings from Studies 1-2 dovetail with these prior claims, finding evidence that those living in more ethnically diverse areas results in behaviour that suggests potentially greater withdrawal from the community, such as greater rates of living alone. Moreover, Studies 1-2 provide behavioural response measures, as opposed to self-report measures, through measurements of societal interpersonal structure. In the intergroup relations domain, self-reported values may not always correspond with enacted behaviour in intergroup contexts because social desirability and perceptions of social costs may be high (e.g., Shelton, Richeson, Salvatore, & Hill, 2006; Dodd, Giuliano, Boutell, & Moran, 2001). The research findings from Studies 1-2 offers an objective assessment that bypasses some of these concerns, reporting on findings of actual behaviour as a function of the levels of ethnic diversity in one's environment.

Overall, the studies in this dissertation offer insight into the intergroup relations literature in a few different ways. By adopting a cultural perspective, the present studies move from the social psychological approach of focusing on how intergroup relations can shape outward attitudes and biases, and investigates how interethnic contact may be shaping perceptions of the *self*. These studies also contribute to theories of interethnic contact and intergroup conflict, presenting evidence for how areas of high ethnic diversity affect reports of interethnic anxiety,

and changes in interpersonal structure and practices in communities.

Implications for the Cultural Change Literature

The research presented in this dissertation is the first to systematically investigate the influence of ethnic diversity on cultural change. Prior research suggests that large-scale sociodemographic shifts have resulted in a cultural change toward increasing rates of individualism, with many seeking to understand the underlying causes behind such changes (e.g., Hamamura, 2012; Grossmann & Varnum, 2015). Although the levels of ethnic diversity may be considered one sociodemographic variable that has shifted dramatically over time, its investigation as a predictor of cultural processes had yet to be explored. The findings in these studies suggests that the increasing levels of ethnic diversity that coincided with rising individualism were not coincidental, but rather an interrelated process that affected cultural change.

With ethnic diversity emerging as a predictor of rising individualism, it joins several other sociodemographic predictors of cultural change (e.g., urbanization, commercialization, Greenfield, 2016; socioeconomic status; Grossmann & Varnum, 2015; pathogen prevalence; Varnum & Grossmann, 2017). The present research suggests that ethnic diversity may be an important cog in understanding the process of cultural change. Future research seeking to understand cultural change should consider other large-scale factors—e.g., the rates of inequality present in society—to help further understand the ongoing puzzle.

Understanding the role of ethnic diversity also helps provide information for *why* cultures are changing, a relatively unaddressed question in the cultural change literature. While much of the research on the topic of cultural change thus far has focused on *how* cultures are changing, Varnum and Grossmann (2017) argue that the question of *why* cultures are changing is going to

provide the field with increasing value to help understand the bigger picture of cultural change and the consequences of such a change. With an understanding of why cultural change is happening, researchers can start to understand why recent societal developments have unfolded the way they have. However, the possibility of rising individualism accounting for any particular societal changes requires further investigation.

An additional implication these studies have for the cultural change literature is that they provide a preliminary investigation into how increased individualism may be having consequences on people's reports of well-being and open-mindedness. While prior researchers have focused on how cultures are changing, it may very well be that why cultures are changing is because it is adaptive and beneficial for communities and individuals to do so. Evidence from Studies 4-6 in this dissertation suggest that individualism can promote greater open-mindedness, and reports of greater well-being. In contexts of higher education for example, higher rates of individualism have been associated with better adaptation to, and performance in, higher education academic contexts (e.g., Stephens et al., 2012). Moreover, greater open-mindedness may be helpful for people to make sense of the increase in the diversity of perspectives and values that come to light from interacting with ethnically different others. These results suggest that rising individualism has consequences on psychological processes, and suggest it may be occurring because it is helping people adapt to their environments. Future research however, would need to be done to better understand and support these positions. For instance, although individualism may be considered adaptive in higher educational contexts, ethnic diversity may be affecting other processes such as belongingness, which may influence the adaptive function of individualism.

Limitations and Future Directions

There are a few limitations in the present research that should be acknowledged. As with many psychological studies, the interpretation of the results is limited by the study designs and the methodology undertaken to assess the underlying constructs. For instance, the measure of ethnic diversity in each study was operationalized through the use of ethnic fractionalization. As acknowledged in the methods of Study 1, there was theoretical motivation behind such a decision, which was that ethnic fractionalization was used because it captures the direct distribution of ethnic diversity intended to be assessed in this research. However, it is worth noting that ethnic diversity may be conceptualized in several other ways, including ethnolinguistic diversity—which considers language differences within groups, and ethnic polarization—which considers how polarized a distribution of ethnic groups are (Alesina et al., 2003). There is evidence that these different ways of conceptualizing ethnic diversity capture different constructs and predict different outcomes (e.g., Montalvo & Reynal-Querol, 2010). As a result, it is possible that although the associations observed in these studies show that ethnic fractionalization predicts individualism, it may be the case that different operationalization of ethnic diversity can differentially impact cultural values of individualism. For instance, areas with high ethnic polarization may result in greater individualistic behaviour because the greater likelihood of tension between ethnic groups.

In line with limitations for the usage of ethnic fractionalization as an index of ethnic diversity, it is also worth noting that the measure itself relies on the availability of ethnic categories to compute the level of ethnic diversity. The decision to choose ethnic groups in Studies 1-2 was based on ethnic group data availability in the U.S. census, influencing the usage of ethnic groups in subsequent studies to maintain consistency. Nevertheless, limitations in the

ethnic categories used throughout the studies should be considered. For example, the meaning of ethnic groups may change over time, resulting in different ways individuals may choose to report their ethnic background, impacting the accuracy of the measure of ethnic diversity captured each year. Relatedly, the decision to group ethnic categories into an "other" category in each of the studies limited how refined the computation of ethnic diversity ended up being. Notably however, researchers argue that categorizing ethnic groups in such a way might be necessary. For example, Fearon (2003) suggests that there is not really a clear end in categorization of ethnic groups, such that grouping ethnic groups when measuring indices of fractionalization in the social sciences can be an effective methodological approach. Thus, although there exists some concern over the level of refinement, there does not appear to be guidelines for what is considered an ideal number of ethnic categories for assessing levels of fractionalization in a population.

It should also be noted that the indices of individualism assessed in Studies 1 and 2 were based on previously purported correlates of individualism. Measures such as multi-generational households and distinctive naming practices are considered behavioural correlates of individualism (e.g., Grossmann & Varnum, 2015). However, there is reason to suspect that using the prevalence of ethnic diversity in a population as a predictor of these measures may affect their validity as indicators of individualism. For example, the levels of ethnic diversity in a population may affect the proportion of traditional Anglo-Saxon names provided to newborns. Ethnic diversity may also influence the presence of multigenerational households in a population—for example, prior research suggests that ethnic diversity is associated with lower income areas (Alesina & La Ferrara, 2005), which suggest that economic affordances in highly diverse areas may influence the need for multi-generational households. Although this suggests

there may be overlap between measures of ethnic diversity and the measures of individualism used in Studies 1 and 2, it is possible that greater ethnic diversity may still be uniquely contributing to greater rates of individualism. For instance, greater exposure to ethnic diversity is likely to increase exposure to unique names, providing parents with the exposure and knowledge for their expressions of individualism. Thus, ethnic diversity may be contributing to distinctive naming practices beyond the presence of greater unique names from different ethnic groups in a population. Nevertheless, because such effects within the designs in the present research are not possible to differentiate, these possibilities remain speculative.

Future Directions. Despite the limitations in study designs and measures from the present studies, the collective results from the presented in this dissertation offer a coherent picture of the association between ethnic diversity and individualism. As a result, these findings open up several avenues of lines of research. One potential line of inquiry involves understanding the directionality of such an association. Does ethnic diversity increase individualism, or might individualism drive people toward more ethnically diverse environments? Although the theoretical models presented in this dissertation focus on the possibility of the former, it is plausible that the relationship may be in the opposing direction, or bidirectional (e.g., see research on residential mobility; Oishi, 2010). Further research would be needed to assess the directionality of the relationship. A second potential line of inquiry involves the assessment of the effects of ethnic diversity on cultural values as a function of the level and length of exposure to ethnic diversity over time. That is, future research can help investigate whether there is a critical level of ethnic diversity needed to initiate a transition toward individualism. Future research could also assess the importance of the length of time spent exposed to different levels of ethnic diversity when it comes to affecting individualistic values

and behaviour. These types of questions are those that directly follow up on theoretical debates in the economic and political science literatures. For instance, Putnam (2007) proposed that ethnic diversity will challenge social solidarity and inhibit social capital "in the short to medium run", but that societies will collectively be able to integrate and minimize this effect in the "medium to long run" (pp 138-139). As an ongoing discussion in the literature, there is debate over what exactly a *short, medium,* and *long,* amount of time means. This debate has been used to argue for why there are inconsistencies in the literature regarding the theoretical predictions Putnam made, suggesting that ethnic diversity may result in different effects on social solidarity and social capital in different countries and communities because of the length of time these areas have been exposed to diversity (e.g., Lancee & Dronkers, 2008).

Following this previous notion, the present results suggest that ethnic diversity within the U.S. appear to shape the interpersonal structure and practices that people adopt within the span of 66 years (1950-2016). It may be of interest to future researchers to capitalize on this timeframe, examining other timeframes and differing levels of ethnic diversity on social trust and interpersonal behaviour. Notably, the level of exposure to ethnic diversity and the rates of ethnic diversity in other countries and areas are likely to differ markedly from the U.S.'s progression over the past half century. Thus, future research would benefit greatly by expanding the findings in this dissertation to examine ethnic diversity and cultural change outside of the U.S., which would provide an investigation of these findings in different contexts and tests the replicability of these findings, as well as the claims made by prior researchers on the consequences of ethnic diversity.

Another potential avenue of future research would be to investigate results obtained on the relationship between social class and cultural values, which in Studies 5 and 6 suggested that

upper class individuals tended to express a greater endorsement of collectivism, relative to lower class individuals. These results are in opposition to findings in the psychological literature, which suggest that upper class individuals tend to report lower collectivism (e.g., Kraus et al., 2012). Further research into why these results were found could be worth pursuing, such as assessing the methods of measuring social class and the implications of these methods on social class' relation to cultural values could be a fruitful future avenue of research. An additional avenue of potential future research involves testing the relationship that levels of ethnic diversity might play on other dimensions of cultural orientations. Over the past century, cultural researchers have classified and discussed numerous different cultural dimensions—including power distance, uncertainty avoidance, masculinity and femininity (e.g., Hofstede, 1984, 2011). Although cultural psychology research has predominately focused on the individualism and collectivism dimensions, it is possible that other meaningful cultural dimensions will be impacted by the levels of ethnic diversity in society. Cultural dimensions such as uncertainty avoidance (Hofstede, 1985) and tightness-looseness (Gelfand et al., 2011; Uz, 2015) are just a few other cultural dimensions that may reasonably be impacted by the degree of ethnic diversity prevalent in an environment. Tightness-looseness for example—a reflection of the strength of norms and tolerance of norm violations, may be heavily influenced by the presence of different norms upheld by ethnically different others in our environments. It is possible that cultures may become "tighter", such that the presence of uncertainty and unfamiliarity can result in greater clinging toward one's values (e.g., McGregor, Nash, Mann, & Phills, 2010). However, given the relationship observed in Studies 5-6 between individualism and open-mindedness, it may be the case that ethnic diversity may encourage a culture to become "looser", because the exposure to different values, practices, and expectations may encourage people to loosen one's perceptions

and desire to uphold the norms they follow. These opposing perspectives suggest a lack of clarity in terms of whether individualism may encourage open-mindedness, or if open-mindedness may promote greater individualism. Building on the association between open-mindedness and individualism in Studies 5 and 6, future researchers should investigate the causal direction between individualism and open-mindedness, as well as explore the implications that ethnic diversity may have on different cultural dimensions.

The past decades have seen increasing levels of ethnic diversity and cultural values of individualism across the globe. The present research is the first to empirically investigate the association between ethnic diversity and individualism, showing their interrelation over time, as well as the association between perceptions of ethnic diversity in one's environment and their endorsement of individualistic cultural values. These findings suggest that ethnic diversity is encouraging greater individualism, offering a path for researchers to investigate novel predictors of cultural change, and contributes to an ongoing discussion that helps understand social change. From the insight gained in this research, organizations, policy makers, educators, and researchers can equip themselves with the tools to better face the changing tides coming to our society.

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Appendix A

R Syntax Code (Study 1)

```
#Simulating 10,000 bootstrapped samples between two variables with 0 autocorrelation.
simnum<-10000
simul <- matrix(nrow=simnum, ncol=1, 0)
for (i in 1:simnum){
  ar.sim<-arima.sim(model=list(ar=c(0)),n=22)
  ar.sim2<-arima.sim(model=list(ar=c(0)),n=22)
  simul[i] <- cor(ar.sim,ar.sim2)
}
hist(simul)
quantile(simul,c(0.025,0.975))
```

#Simulating 10,000 bootstrapped samples with first-year autocorrelations observed for ethnic fractionalization and individualistic interpersonal structure.

```
simnum<-10000
simul <- matrix(nrow=simnum, ncol=1, 0)
for (i in 1:simnum){
  ar.sim<-arima.sim(model=list(ar=c(.789)),n=22)
  ar.sim2<-arima.sim(model=list(ar=c(.716)),n=22)
  simul[i] <- cor(ar.sim,ar.sim2)
}
hist(simul)
quantile(simul,c(0.025,0.975))
```

#Simulating 10,000 bootstrapped samples with first-year autocorrelations observed for ethnic fractionalization and unique naming practices.

```
simnum<-10000
simul <- matrix(nrow=simnum, ncol=1, 0)
for (i in 1:simnum){
  ar.sim<-arima.sim(model=list(ar=c(.789)),n=22)
  ar.sim2<-arima.sim(model=list(ar=c(.758)),n=22)
  simul[i] <- cor(ar.sim,ar.sim2)
}
hist(simul)
quantile(simul,c(0.025,0.975))
```

Appendix B

Mean-level ethnic fractionalization for each U.S. State across the years 2000-2016 (Study 2)

U.S. State/District	*Mean*(SD)	U.S. State/District	*Mean*(SD)
Alabama	.44(.01)	Montana	.19(.01)
Alaska	.51(.02)	Nebraska	.21(.01)
Arizona	.38(.02)	Nevada	.44(.06)
Arkansas	.35(.02)	New Hampshire	.10(.02)
California	.57(.02)	New Jersey	.48(.03)
Colorado	.29(.01)	New Mexico	.47(.03)
Connecticut	.35(.04)	New York	.52(.02)
Delaware	.44(.03)	North Carolina	.45(.02)
District of Columbia	.57(.02)	North Dakota	.18(.03)
Florida	.38(.01)	Ohio	.28(.02)
Georgia	.52(.02)	Oklahoma	.43(.02)
Hawaii	.80(.005)	Oregon	.25(.03)
Idaho	.15(.02)	Pennsylvania	.29(.03)
Illinois	.44(.02)	Rhode Island	.31(.03)
Indiana	.26(.02)	South Carolina	.47(.01)
Iowa	.14(.02)	South Dakota	.21(.07)
Kansas	.26(.02)	Tennessee	.35(.02)
Kentucky	.20(.02)	Texas	.44(.02)
Louisiana	.49(.01)	Utah	.20(.03)
Maine	.08(.02)	Vermont	.08(.02)
Maryland	.55(.03)	Virginia	.46(.02)
Massachusetts	.32(.04)	Washington	.36(.03)
Michigan	.35(.01)	West Virginia	.11(.01)
Minnesota	.24(.03)	Wisconsin	.23(.02)
Mississippi	.50(.01)	Wyoming	.16(.01)
Missouri	.28(.02)		

Appendix C

Interethnic Contact and Interethnic Anxiety Measures (Studies 3-6)

Interethnic Contact

1. I frequently have contact with people from another racial/ethnic background.
2. I do not know many people that are from a different racial/ethnic background than my own. (R)
3. Many of the people I socialize with are from a different racial/ethnic background than my own.
4. In my immediate social network, many of the people I know are from another racial/ethnic background.

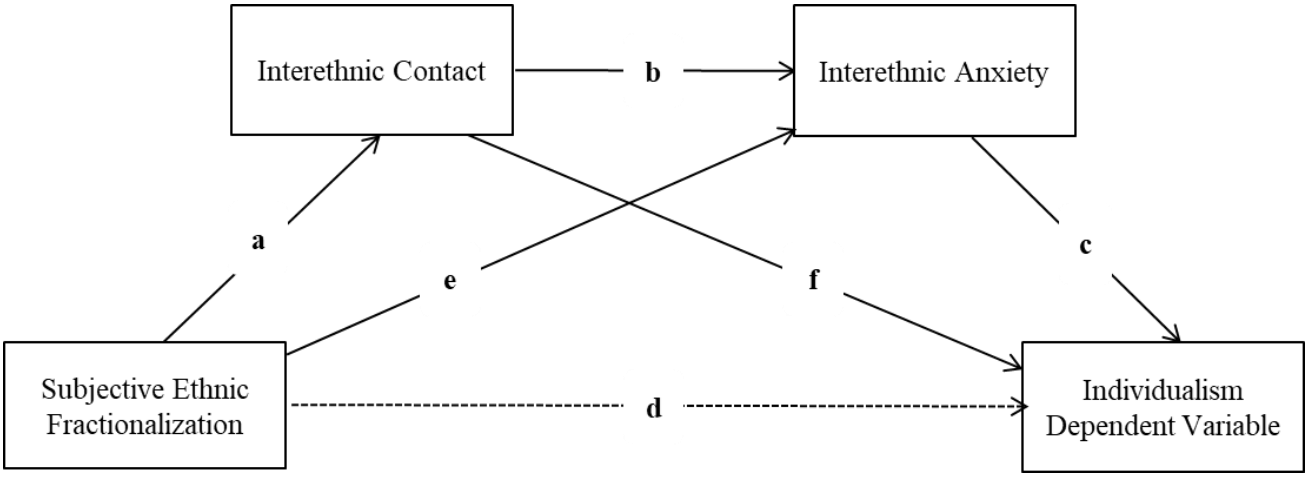
Interethnic Anxiety (adapted from Britt et al., 1996)

1. I experience little anxiety when I talk to those from another race. (R)
2. I just do not know what to expect from people of another race than my own.
3. I can interact with people of another race without experiencing much anxiety. (R)
4. I worry about coming across as a racist when I talk with those of another race.
5. It makes me uncomfortable to bring up the topic of racism around people of another race.
6. The cultural differences between me and others of a different race makes interactions awkward.
7. I would experience some anxiety if I were the only person in a room full of those from another race.
8. If I were at a party, I would have no problem with starting a conversation with a person of another race. (R)
9. My lack of knowledge about other races prevents me from feeling completely comfortable around them.
10. I would feel nervous if I had to sit alone in a room with a person of another race and start a conversation
11. Although I do not consider myself a racist, I do not know how to present myself around those from another race.

Note. Participants completed their agreement with these items on a scale from 1 (Strongly disagree) to 7 (Strongly agree). (R) = reverse scored items.

Appendix D

Serial Mediation Pathway Model Tested in Studies 3-6



			Model Paths (standardized betas)					
		Serial Mediation						d
Study	DV	95% CI	a	b	c	e	f	direct (total)
3	Singelis	[.09; .29]	.30***	-.51***	-.26***	.11*	.16**	-.03 (-.05)
4	Singelis	[-.05, .15]	.22*	-.44***	-.06	-.10	.33**	.08 (.01)
5	Oyserman	[.12, .34]	.31***	-.51***	-.30***	.12*	.20***	.09 (.06)
6	Oyserman	[.001, .10]	.24***	-.43***	-.11*	.01	.28***	.08 (.02)

Note. Singelis' Individualism = Serial mediation model for subjective ethnic fractionalization predicting individualism measures across Studies 3-6. Serial mediation results represent the 95% confidence intervals of 5000 bootstrapped samples using Hayes Process Macro. The serial mediation is considered significant if zero does not fall between the 95% bootstrapped confidence intervals (Preacher & Hayes, 2004). Subjective ethnic fractionalization for the Study 3 pathway reflects participant's ratings of their present community's ethnic diversity. Subjective ethnic fractionalization for the Study 4 pathway reflects measures collected during Time 2 only. Singelis = Averaged individualistic self-construal items used in Studies 3-4 (Singelis, 1994). Oyserman = Residualized individualism composite measure used in Studies 5-6 (Oyserman et al., 2002).

*p<.05; **p<.01; ***p<.001

Appendix E

Individualism Measure used in Studies 5-6 (Oyserman et al., 2002)

Individualism Subscales

1. *Valuing Personal Uniqueness*
   a. It is important for me to be myself.
   b. I am different from everyone else, unique.
   c. I prefer being able to be different from others.
   d. It is important for me to develop my own personal style.
   e. I enjoy being unique and different from others in many respects.
   f. Though I may have some things in common with others, my personal attributes are what make me who I am.

2. *Valuing Personal Freedom/Happiness*
   a. I often have personal preferences.
   b. My personal happiness is more important to me than anything else.
   c. If I make my own choices I will be happier than if I listen to others.
   d. Individual happiness and the freedom to attain it are central to who I am.
   e. It is better for me to follow my own ideas than to follow those of anyone else.

3. *Valuing Personal Achievement*
   a. A person of character focuses on achieving his/her own goals.
   b. It is important for me to remember that my personal goals have top priority.
   c. For me, hard work and personal determination are the keys to success in life.
   d. My personal achievements and accomplishments are very important to who I am.
   e. I enjoy looking back on my personal achievements and setting new goals for myself.
   f. To know who I really am, you must examine my achievements and accomplishments.

Note. The items used in our study were adapted from prior research on individualism (Oyserman et al., 2002). Participants completed their agreement with these items on a scale from 1 (strongly disagree) to 7 (strongly agree).

Appendix F

Openness to Diversity and Actively Open-minded Thinking Measures (Studies 5-6)

Openness to Diversity

1. The real value of learning lies in being introduced to different values.
2. Learning about people from different backgrounds is an important part of my life.
3. I enjoy having discussions with people whose ideas and values are different from my own.
4. I enjoy talking to people who have values different from mine because it helps me understand myself and my values better.

Actively Open-minded Thinking

1. Changing your mind is a sign of weakness. (R)
2. Intuition is the best guide in making decisions. (R)
3. I don't like to hear things that challenge my beliefs. (R)
4. The information I find tends to support my initial hunches. (R)
5. I can recite the arguments for both sides of issues I care about.
6. I find myself thinking about arguments against things I care about.
7. One should disregard evidence that conflicts with one's established beliefs. (R)
8. People should search actively for reasons why their beliefs might be wrong.
9. People should take into consideration evidence that goes against their beliefs.
10. People should revise their beliefs in response to new information or evidence.
11. Good thinkers look hardest for reasons to support their beliefs, not to challenge them. (R)
12. Allowing oneself to be convinced by an opposing argument is a sign of good character.
13. I care more about reaching the right answer eventually than being able to say "I told you so”
14. It is important to persevere in your beliefs even when evidence is brought to bear against them. (R)
15. It is more useful to pay attention to those who disagree with us than to pay attention to those who agree.

Note. Participants completed their agreement with these items on a scale from 1 (strongly disagree) to 7 (strongly agree). (R) = reverse scored items.