

Unraveling Perceived Ethnic Density Effects and Recontextualizing Acculturation: The cases of  
Student and Russian-Speaking Immigrants to Montreal

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## Abstract

Unraveling Perceived Ethnic Density Effects and Recontextualizing Acculturation: The cases of Student and Russian-Speaking Immigrants to Montreal

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Social context has often been neglected in recent social and culturally focused psychology research (Oishi, Keisibir, & Snyder, 2009; Van de Vijver & Leung, 2000). The immigrant acculturation literature is no exception. Research linking acculturation to adjustment has been permeated with inconsistent results, partly due to differences in methodologies, settings, and samples between studies (see Trickett Persky & Espino, 2009). A potential avenue towards resolving these inconsistencies is to study acculturation in ecological context. Ethnic Density (ED), the concentration of immigrants of the same ethnicity residing in an area, is one such ecological variable. ED has generally been associated with better mental health, but again there are paradoxical findings and the mechanisms of the ED effect are rarely addressed (Shaw et al., 2012). Since ED and acculturation phenomena are seldom combined in research (cf. Kwag, Jang, & Chiriboga, 2012) an attempt was made to remedy this situation in the current investigations.

Two studies attempted to unpack the mediating mechanisms of the perceived local area ED effect and contextualize acculturation-adjustment relations in Montreal. The first, utilizing a heterogeneous group of student immigrants ( $N=146$ ), found that ED protected participants against depression via reduced discrimination. Furthermore, ED moderated the relation between heritage acculturation and depression, suggesting a person-environment match: immigrants tended to benefit from heritage acculturation living in a high but not low ED context. The

second, a community study of Russian-speaking immigrants from the former Soviet Union ( $N=269$ ), aimed to replicate and extend these findings. A multi-item measure of perceived ED was developed and validated against an objective indicator. Again, an indirect effect of ED was found, but this time for general distress through acquiring social support. Moreover, heritage acculturation was double moderated by perceived ED and length of neighbourhood residence. This interaction indicated an ethnic density-heritage acculturation match but for more recent neighbourhood residents. A different relation emerged for established neighbourhood residents, where low ED was associated with more symptoms, especially for those low on heritage culture affiliation. In neither study did mainstream acculturation interact with ED to predict adjustment. The findings support studying acculturation in ecological context, and suggest that heritage acculturation is relevant to adjustment in Montreal, a unique city with more than one dominant culture. Future research directions as well as clinical and prevention implications are discussed.

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## Contribution of Authors

Tomas Jurcik decided on the general content of the research studies and samples, selected the measures and developed relevant items, reviewed the literature, analyzed the results and wrote the manuscripts and dissertation. He also directed the research team. Esther Yakobov and Rana Ahmed were involved in recruitment, maintaining and managing the online surveys, data cleaning, participated in data analyses and made general comments on both of the study manuscripts. Liza Solopieieva-Jurcikova completed the translation of the survey into Russian, assisted with data cleaning and conceptualizing analyses for both studies, and liaised with the Montreal Russian-speaking community. Momoka Watanabe assisted on the second study with preparation of tables and figures, helped with organizing data entry, and provided feedback on the second manuscript. Andrew Ryder provided guidance on the contents of the survey and method, and provided feedback and commentary on both the manuscripts and dissertation. An abridged version of the first study was published in *Journal of Community Psychology* while the second study has been submitted for peer review.

## General Introduction

### **Decontextualization in contemporary social, cultural, and clinical psychology**

“Without understanding social structures, personal troubles cannot be solved”

-Oishi, Kesibir, and Snyder (2009, p. 336).

“Most psychologists are so preoccupied with the salient features of the individual’s mental life that they forget it is the ground of the social group that gives to the individual his figured character. Just as the bed of a stream shapes the direction and shape of water so does the group shape the current of an individual’s life.”

-Allport (1948, p. vii).

Social psychologists have in recent decades become increasingly focused on individual level phenomenon at the expense of sociological analysis (e.g., Oishi et al., 2009), a tendency mirrored by psychologists conducting cultural research, who often neglect to consider contextual factors (van de Vijver & Leung, 2000). There have been numerous attempts to partner with biology, evolutionary psychology, and neuroscience (e.g., Chiao, Cheon, Pornpattananangkul, Mrasek, & Blizinsky, 2013; Ryder, Ban, & Chentsova-Dutton, 2011). Indeed, neuroscience has gained increasing credibility and has enjoyed extensive funding; hence it is arguable that some natural pressures have emerged for “softer” subdisciplines within psychology to ally themselves with neural level approaches. Furthermore, integration has the prospect to be mutually informative; for instance, neuroscience can effectively inform phenomena described by cultural psychologists, and vice versa, such as the neural underpinnings of analytic versus holistic thinking (e.g., see Chiao et al., 2013). While there are considerable merits to such *sine qua non* mergers, further decontextualization of the human experience from its social environs may have been inadvertently facilitated in recent years. For instance, with the

increase in neural correlates available for mental disorders, clinical psychologists have been grappling with criticisms related to “neurological reductionism” (Herlihy & Grandy, 2002, p. 248). Applied psychologists recognize that there are different levels of explanation and are increasingly becoming resistant to Cartesian body-mind dualism, citing how medical conditions such as heart disease can have psychological level explanations (see Herlihy & Grandy, 2002). Thus, mind and body are mutually constituted (i.e., interdependent) and offer different levels of description or explanation, just as cultural psychologists have recognized that mind, society and culture are interwoven (Markus & Hamedani, 2007; Schweder, 1990).

A focus on social structure at the beginning and middle part of the last century has been replaced by a pragmatic and predominantly individualistic and atomized stance on psychological phenomena (see Oishi et al., 2009). Hence, what is rarely emphasized in clinical psychology is the issue that the mind-brain entities operate within complex and overlapping levels of social systems, from family units, to neighbourhoods to sociopolitical environments, and so on (see Bronfenbrenner, 1994). Analogously, the recent tendency of cultural psychology specifically, and social psychology more broadly, to neglect situational factors has not gone unnoticed in some of the critical literature (e.g., Oishi et al., 2009; Markus & Hamedani, 2007; van de Vijver & Leung, 2000; but see J.G. Miller, 1999, critique of the limitations of earlier research which reduced culture to ecology). Social psychology could be critiqued for having committed Ross’s (1977) fundamental attribution error (FAE) in recent decades by detaching itself from sociology – that is, overemphasizing dispositional factors at the expense of external, situational ones (see Oishi et al., 2009). For instance, social psychologists frequently engage in laboratory research on individual phenomena related to self-concepts, such as failure experiences on self-esteem and motivation; attitudes, such as stereotype activation in implicit association tests or terror

management of existential threats, and effective persuasion in the mass media (e.g., Kunda, 2000). While the findings provide an important contribution to understanding individual motives and attitudes, considerably less emphasis has been on how naturalistic interactions with broader day-to-day social contexts situate and shape particular individual views and vice versa. Earlier research which focused on social contexts such as the bystander effect, conformity and obedience to authority, was especially popular following the Second World War (see Gergen, 1973) although an increase in laboratory research and a decreased interest in group level phenomena became apparent by the 1960s (see Oishi et al., 2009). Contemporary cultural psychology arguably deserves greater environmental or *sociocultural* attention as well, in terms of better specifying how situations and the environment are mutually constituted (i.e., closely interwoven) with the psychological (Markus & Hamedani, 2007). For instance, some have argued that earlier research on collectivist/interdependent ‘Easterners’ and individualist/independent ‘Westerners’ represented a type of inadvertent cultural stereotyping, implying that particular traits were involved, rather than contextualized and complex person-environment interactions, which is the more recent view (see Markus & Hamedani, 2007). Thus, so-called ‘collectivists’ may be cooperative in some settings (e.g., with ingroups members), and more competitive in others (i.e., with the outgroup; Triandis, 1995). However, many psychologists examining culture have neglected to sufficiently analyze social contexts (van de Vijver & Leung, 2000).

The FAE as a phenomenon is notably more common in ‘Western,’ individualistic cultural groups, and less so in collectivistic ones (J.G. Miller, 1984). By extension, given that psychology researchers are primarily based at North American institutions (see Heinrich, Heine, & Norenzayan, 2010), and the act of exploring personal dispositions and behaviours is especially

an individualistic tendency, the culture of psychology as a discipline is perhaps even more prone to be infused by this bias than other fields of science. Therefore, social, (cross-) cultural and clinical psychology will continue to face limitations in generating contextually meaningful findings unless these subdisciplines embrace a stance that acknowledges macro- and microlevel environmental phenomena. This is not a novel idea – early and mid 20<sup>th</sup> century North American pioneers in psychology had acknowledged the importance of the interrelationship between psychology and sociology (e.g., Tolman, 1938).

A more recent approach that attempts to reconcile the cultural-contextual with the mental and soma, is the emerging discipline of cultural-clinical psychology. The tenet of this approach posits that the mutual constitution of mind and culture (Shweder, 1990) should also include the brain (Ryder et al., 2011). A culture-mind-brain theory (Ryder et al., 2011) will remind researchers that culture is indispensable and inseparable from biology, but such an approach could also benefit from further expansion by elaborating on how social ecological contexts might shape cultural adaptations. After all, culture encompasses meanings (cognitions) and practices (behaviours) that are consensually understood within a group (Bruner, 1990). These practices and cognitions are to some extent framed by environmental demands and intersubjective realities and thus vary from one group to another (e.g., Chiu, Gelfand, Yamagishi, Shteynberg, & Wan, 2010). Hence, the term “sociocultural” as an alternative to “culture” or “cultural” has recently gained greater appeal to some theorists (Markus & Hamedani, 2007).

While there is a move towards integration of contextual variables in social, cultural and clinical psychology, much of the research related to the intersection between psychological and contextual factors has been seemingly delegated to a subdiscipline, community psychology. Community psychology concerns itself with *second order change* by focusing on system and

institution level issues, as opposed to *first order change* of the individual which has been the traditional focus of clinical psychology (see Watzlawick, Weakland, & Fisch, 1974). As will be implied in this dissertation, both approaches are important and deserve integration, rather than compartmentalization. Community psychology has generated ecologically relevant research (see below) but has been under-cited and thus arguably not sufficiently integrated into the mainstream literature (e.g., although there are limitations to comparing impact factors [IF] across subdisciplines, the IF for the *American Journal of Community Psychology* is less than one half of *Neuropsychology* at the time of this writing, both APA flagship journals). Indeed the very subdiscipline has traditionally been marginalized in academia and beyond. Nelson, Lavoie and Mitchell (2007) write that community psychology represents “a minority or [is] altogether absent in Canadian psychology departments that have been dominated by experimental and clinical psychology... [and] the lack of visibility extends beyond the walls of university settings” (p. 28). The decontextualization and compartmentalization of subdisciplines may lend itself relatively well to analytical and non-holistic thinking styles more common in ‘Western’ culture (see Nisbett, Peng, Choi, & Norenzayan, 2001) that likely permeates academia itself.

Despite its marginalized position, community psychology has been contributing from the margins pioneering ecologically relevant research in addition to advocating the importance of person-environment “fit” relationships (Angelique & Cully, 2007, p. 52). That is, it posits that well-being is promoted when the environment matches with the style of the individual. For instance, neighbourhood residential satisfaction may be a product of a good fit or match between environments (e.g., facilities, aesthetics, proximity to locations) and personal needs and preferences (e.g., E. Kahana, Lovegreen, B. Kahana, & M. Kahana, 2003). As will be implied

throughout this research programme, community psychology's *modus operandi* may help fill the contextual gaps in cultural, clinical and social psychology.

### **The case of decontextualized acculturation**

Decontextualized research permeates social, (cross-) cultural and clinical psychology. One such example is the acculturation and immigrant mental health phenomenon, the focus of the current dissertation (see also Trickett, Persky, & Espino, 2009). The following section provides some background on acculturation-adjustment research and introduces ethnic density, an ecological contextualizing variable that may assist in resolving certain inconsistencies in the empirical literature on acculturation. This will be followed by outlining the aims of the current research programme, and a pair of studies with different immigrant populations that were conducted. After the presentation of the two studies, the dissertation will conclude with a general discussion regarding the importance of contextualizing acculturation research in social ecology specifically, which extends to social psychology research more broadly.

With striking levels of globalization since World War Two, the trajectories of diverse ethnocultural groups have been intersecting more often than at any other time in recorded history (see Bakker, van Oudenhoven, & van der Zee, 2004). The inevitable cultural change that occurs when two or more groups come into first-hand contact with each other is a process referred to as acculturation (Redfield, Linton, & Herskovits, 1936), a topic that has sustained considerable research attention for many decades. Although there are various working definitions available, psychological acculturation is generally defined as the changing beliefs, values, and behaviours that occur when migrants come into contact with a new society (Ryder, Alden, & Paulhus, 2000). It is undeniable that acculturation takes place within a particular environmental context, yet much acculturation research has focused on individual-level experiences and how they relate to

immigrant adjustment despite recent efforts at sociological analysis (e.g., Berry, 2006a; Sam & Berry, 2006; Bourhis, Moise, Perrault, & Senecal, 1997).

There are various definitions of acculturation, with numerous methods in existence to measure this concept, along with inconsistent outcomes related to various instruments. The existence of multiple and often psychometrically problematic methods has led to considerable contention in the literature (e.g., Rudmin, 2003, 2006, 2009; Trickett et al., 2009). Early researchers developed unidimensional models which implied that immigrants shed their heritage culture in favour of a mainstream one (e.g., Gordon, 1964). Although such models continue to be used (e.g., Kwag, Jang, & Chirboga, 2012), bidimensional models that measure heritage and mainstream acculturation separately have been shown to be more valid than unidimensional models (e.g., Schwartz et al., 2010). The two dimensions may be relatively orthogonal statistically and have differential utility in measuring various constructs, including personality and adjustment outcomes (Ryder et al., 2000). For example, while heritage and mainstream acculturation have both negatively predicted neuroticism in a bidimensional model, a unidimensional model may fail to do so, presumably because the effect of both (unmeasured) dimensions cancel each other out (Ryder et al., 2000). Moreover, given the increase in human cultural diversification, acculturation methodologies that use multiple (i.e., three or more) dimensions are beginning to receive some attention, but less research is available on such approaches (e.g., Birman, Persky, & Chan, 2010; Downie, Koestner, ElGeledi, & Cree, 2004). For instance, some immigrants from the Former Soviet Union settling in the United States may affiliate with the American mainstream, but may choose to maintain a Russian, as well as Ukrainian or Jewish heritage cultural identity (Birman et al., 2010). Similarly, in Montreal, the context of the present study, immigrants may choose to identify with both French and English

mainstream cultural groups along with their respective heritage culture affiliation (Downie et al., 2004). The current research programme recognizes such complexity (e.g., in study 2, we measured a heritage dimension and two mainstream dimensions but selected the highest score for each mainstream item); however, for pragmatic purposes we utilized a bidimensional approach to measuring acculturation. The acculturation process is extremely complex and most measurement approaches will have limitations to capturing it accurately (see e.g., Trickett et al., 2009).

Acculturation psychologists have acknowledged that various systems external or interactive with the individual (e.g., sociopolitical, neighbourhoods) likely shape acculturation processes and outcomes (e.g., Berry, 2006a; Schwartz et al., 2010). Despite this assumption, much acculturation research continues to rely on individualist terminology such as acculturation ‘strategies’ (Berry, 2006b). This term may imply a voluntary approach that immigrants decide on (Schwartz et al., 2010): they choose to either *integrate* (high on both mainstream and heritage), *separate* (low on mainstream, high on heritage), *assimilate* (low on heritage, high on mainstream) or become *marginalized* (i.e., low on both affiliations). Early bidimensional models, such as Berry’s (1997) were fruitful in generating considerable research. Berry and his colleagues (for review see Berry, 2006b) discovered that as immigrants encounter acculturative stress, integration is considered to be a strategy that is most beneficial to mental health, and marginalization the most detrimental. Separation and assimilation fall between the extremes on well-being.

These are important findings, but the emphasis on personal strategies may minimize, if not negate, social ecological pressures that may influence the use of particular ‘strategies’ over others. For instance, separation may be more adaptive than integration or assimilation for

devalued immigrant groups who are targets of intensive discrimination from mainstream members (see Schwartz et al., 2010). Others who due to social pressures report being ‘marginalized’ (an ironic sounding ‘strategy’) may instead be effectively affiliated with a sub-culture or third cultural group. Indeed, Berry’s approach has been criticized for confusing marginalization with maladjustment (Rudmin, 2006). Moreover, measurement problems arise with this categorization approach since instead of using independent items to assess heritage and mainstream acculturation, it uses potentially confusing double-barreled questions, creates artificial boundaries by obfuscating the natural variability within and between each of the four uneven groups, and thereby confounds dimensional with categorical concepts (Rudmin, 2006; Schwartz et al., 2010).

As an alternative to categorizing individuals into one of four quadrants, positing heritage and mainstream acculturation as independent and continuous dimensions may be a more sensitive measurement approach (e.g., Costigan & Su, 2004; Ryder et al., 2000; Schwartz et al., 2010) and is the one used in the current studies. Nevertheless, even use of consistent measurement tools has led to predictive incoherencies across settings and samples. For example, Ryder et al. (2000) found that mainstream acculturation was predictive of well-being in a group of individuals of Chinese ancestry in Vancouver, which was also replicated in a Chinese sample in Germany (Zhang, Mandl, & Wang, 2010). However, a recent study found that heritage acculturation protected certain Muslim immigrants in Canada from depressive symptoms while mainstream acculturation placed them at risk (Asvat & Malcarne, 2008; for a contrasting study showing heritage acculturation to be positively related to suicidality in a different sample and context, see Kennedy, Parhar, Samra, & Gorzalka, 2005). The accumulation of empirical research has been largely inconsistent arousing considerable criticism in practically oriented

disciplines. A distinguished author in community psychology considered the research to be “confusing, contradictory and non-cumulative” (Trickett et al., 2011, p. 268). Similarly but less flatteringly, others have considered the evidence base to be “incoherent and unintelligible” and “largely useless to health psychology” (Landrine & Klonoff, 2004, p. 530). The discontent is generally echoed by Rudmin (2009, p. 108) who bluntly stated that “[t]he standard research paradigms have not been successful and need to be changed.”

Several steps can be taken to begin remediating the state of acculturation science, and increasing its utility. First of all, valid and consistent measurement tools need to be used that avoid previous psychometric pitfalls, such as ‘double-barreled’ questions (Rudmin, 2006). Second, clearly defined samples and recognizing limitations to extrapolation are important. For instance, university students are frequently studied, begging questions about generalizability to less affluent and more recent economic migrants that are likely undergoing different challenges (see Heinrich et al., 2010). Likewise, generational status may be confounded in some studies (see Ryder et al., 2000). It is unlikely that first and second generation migrants relate to the mainstream and heritage cultural affiliations in the same manner. Third, acculturation is a process and thus would benefit from longitudinal examination, or at least cross-sectionally at different stages for similar groups (see Ryder & Dere, 2010). Finally, and most relevant to the current thesis, more contextual research is needed on exploring how certain approaches to acculturation may interact with social ecological settings (e.g., sociopolitical, neighbourhood, family environments).

Indeed, differences in inter-group relations and social ecology may lead to disparate acculturation-adjustment patterns (see Bourhis et al., 1997). For instance, it has been shown that certain types of settings are more ethnically and linguistically segregated than others (e.g.,

Montreal vs. Vancouver or Toronto; see Bakhasarian et al., 2005). Thus, while mainstream acculturation may be more relevant and protective against distress in Vancouver (Ryder et al., 2000), heritage acculturation has been found to be a more useful predictor of adjustment in Montreal (Ahmed, Jurcik, & Ryder, 2011). Although speculative, such differences might imply that in more segregated environments and ethnically concentrated contexts, heritage acculturation becomes more critical to well-being than in cities where there is greater ethnic dispersion. Perhaps in the latter setting the predominant mainstream culture is more pronounced in its contribution to adjustment. In other words, the link between acculturation and well-being may not be as straightforward as was initially proposed (see Rudmin, 2006; Schwartz et al., 2010). The contradictions in the empirical literature to date have suggested that the very search for straightforward acculturation findings may be misguided; that acculturation should predict some outcome in general is probably little more than elusive in the absence of contextual factors.

In short, acculturation does not take place in a vacuum and needs to be recontextualized (Trickett et al., 2009). Situational factors including sociopolitical climates, local area ethnic composition, neighbourhood disorder, or family environments, have been largely absent from the empirical acculturation literature. It will be argued that incorporating ecological variables may help resolve discrepancies in acculturation research (see Trickett et al., 2009), such that social ecology may represent a missing contextual link in rendering the findings in this area more consistent and meaningful (e.g., Birman et al., 2005; A.M. Miller, Birman, Zenk, Wang, Sorokin, & Connors, 2009). A focus on decontextualized individual acculturation strategies to date has hampered efforts in generating coherent first order change implications as researchers have largely overlooked person-environment fit phenomena.

### **Recontextualizing acculturation: The example of neighbourhood ethnic density**

There are arguably many approaches to contextualizing acculturation research – at the level of the microsystem, such as family environments (e.g., Asvat & Malcarne, 2008), and at the exosystem level such as neighbourhood ecology (e.g., A.M. Miller et al., 2009) to larger abstract macro levels such as nation states that represent unique sociopolitical climates (e.g., Berry, 2006a; see Broffenbrenner, 1994, for a discussion on ecological models). Since sociopolitical climates are forms of abstraction that are perhaps more difficult to gauge and would likely exert smaller effects, it appears that psychological studies would benefit from lower levels of abstraction such as family and local environments. Only recently has acculturation research taken a renewed interest in neighbourhood factors, such as ethnic density: the ethnic<sup>1</sup> concentration of residents within a given local area (Birman et al., 2005; Juan & Alvarez, 2011; Kwag, Chang, & Chiriboga, 2012; Jurcik, Ahmed, Yakobov, Solopieieva-Jurcikova, & Ryder, 2013a; A.M. Miller et al., 2009; Syed & Juan, 2012). How such a variable interacts with individual variables, such as psychological acculturation, is still unclear. According to person-environment fit theories discussed in community psychology, one might speculate that migrants would respond differently to residing in ethnically dense neighbourhoods depending on how much they value their cultural affiliation with their ethnic group, or perhaps their involvement with the mainstream culture.

Several research groups have recently attempted to contextualize acculturation experiences with social ecology. In one community study, high heritage acculturation was related to greater alienation in Russian women migrants in Chicago; however, living in high immigrant

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<sup>1</sup> Ethnicity is related to culture but is stable over a life-time (i.e., as opposed to acculturation phenomena), and generally refers to a common language, ancestry, history and identity shared by a group (e.g., see B.D. Miller, 1999).

concentrated neighbourhoods weakened this relation (A.M. Miller et al., 2009). In another study in Sacramento, low mainstream (unidimensional) acculturation was associated with more depressive symptoms in Hispanic older adults, such that symptoms were aggravated further when living in neighbourhoods perceived to be low in ethnic density (Kwag et al., 2012). In Toronto, Asvat and Malcarne (2008) showed that a match between perceived family and individual heritage acculturation predicted better adjustment than a mismatch in Muslim students. In other words, people who had low heritage acculturation but perceived their family to be more acculturated reported more depression. It is possible that such a match operates by minimizing dissonance between individual values or expectations and those of the environment, but this remains speculative (see also General Discussion). Regardless of the mechanism, it now appears that the inconsistent relations between acculturation and outcomes in earlier studies may have been at least partly obfuscated by unmeasured or confounding variables, such as ethnic density (see Trickett et al., 2009).

What recent studies are beginning to demonstrate is that effects related to acculturation may be moderated by ecology (or perceptions of ecology), and thus acculturation may show a different relation with outcome variables depending on setting. There is therefore promise in contextualizing acculturation in ecological context, especially ethnic density. Utilization of this contextual variable as well as others (e.g., family environments) may help clarify inconsistencies in acculturation-adjustment research by highlighting person-environment fit, or more specifically, acculturation-ecology match, phenomena.

### **Unpacking ethnic density effects**

Research on ethnic density has had a parallel history with acculturation, and the two literatures have rarely intersected until relatively recently as discussed above. The *ethnic density*

*effect* relates to the benefits conferred on individuals who live in areas of greater ethnic concentration. Although little known to psychologists, this effect has been studied extensively by epidemiologists and social psychiatrists since the 1930s (Faris & Dunham, 1939), and has been shown to be protective against hospital admissions, psychiatric disorders and symptoms, including psychosis, common mental disorders such as depression, as well as physical disabilities and morbid health behaviours, such as smoking (for recent reviews, see Bécaries et al., 2012; Shaw et al., 2012).

Research however has not advanced much in identifying mediating mechanisms, although authors in the field have been beginning to investigate discrimination and social support as mediators with mixed success (e.g., Das-Munshi et al., 2010, 2012; Shaw et al., 2012). A qualitative interview study in London suggested that immigrants may find a kind of “psychic shelter” in such environments, perhaps through increased social networks, access to resources and cultural facilities, and less exposure to racism and discrimination (Whitley et al., 2006). In addition to the limited empirical data, it is also unclear whether these effects are assumed to be universal or group-specific. Moreover, the effect has mostly been studied at the objective (i.e., census) level but recent studies have been obtaining significant findings at the subjective level (e.g., Kwag et al., 2012; Stafford et al., 2009). Both objective and subjective indicators are moderately correlated (Stafford et al., 2009); there is a possibility that the latter may be more sensitive, which could be especially useful when faced with limitations in power (see Juan & Alvarez, 2011; cf. Bécaries et al., 2012).

Finally, just as with acculturation research, notable inconsistencies arise in the ethnic density literature. That is, null effects are not uncommon, and occasionally reverse effects are found (Shaw et al., 2012; Stafford et al., 2009). For example, in one study, Pakistani participants

in the UK were found to experience increased risk for psychosis compared to their Bangladeshi and Indian counterparts with increasing ethnic density (Bécares et al., 2009), and several studies in the US and Canada have shown a positive relation between ethnic density and mental disorders in adolescents from various visible minority groups (reviewed in Shaw et al., 2012).

Only recently has epidemiological research begun to focus on psychosocial phenomena associated with ethnic density, including perceived discrimination and quality of social support (e.g., Bécares, 2009; Das-Munshi, 2010, 2012). Moreover, acculturation has been unmeasured in large scale epidemiological studies. As was alluded to in the section above, a reverse ethnic density effect could very well be due to a mismatch between ethnic density and acculturation. For example, it has been shown that young immigrants are likely to be lower on heritage acculturation than their parents (Asvat & Malcarne, 2008). This might shed light on why ethnic density might be problematic for particular groups of adolescents (see Shaw et al., 2012). In other words, these youth may have found that their environments were at odds with their personal beliefs, values, and behaviours, thereby generating sufficient dissonance over time to manifest as elevated psychological distress. The implications associated with acculturation-ecology match or mismatch on adjustment deserve further research (Asvat & Malcarne, 2008).

In sum, research on the ethnic density effect warrants greater attention in unpacking its mechanisms. Analogous to problems associated with decontextualizing psychological variables, inconsistencies in ethnic density effects could possibly be explained by the fact that acculturation was unmeasured. A closer integration of both social ecology and psychological acculturation phenomena would be consistent with person-environment fit theory espoused by community psychology, and may be especially fruitful in resolving empirical inconsistencies and generating more meaningful and clinically useful research (see Trickett et al., 2009).

## **Rationale, aims and outline of the dissertation**

The current research programme attempts to address some of the pitfalls associated with acculturation research discussed above. Our aim is to situate acculturation in an ecological context while unpacking the mechanisms of the perceived ethnic density effect. Two studies were conducted toward this purpose: the first is a pilot study with a diverse group of immigrant students (predominantly of visible minority backgrounds), the second is a study extending and replicating the first, with a more homogeneous group of Russian-speaking migrants from the Former Soviet Union to Montreal. Despite the demographic and cultural differences, both groups comprise first generation immigrants only. There is a considerable overlap in measurement tools for both our studies, including a psychometrically reliable and valid bidimensional measure of acculturation (Ryder et al., 2000), rendering the pattern of findings broadly comparable. Although a longitudinal paradigm was not undertaken, we did account for length of neighbourhood residence in our second sample, providing us with a glimpse with how this variable might further moderate local area ethnic density and acculturation interactions.

Both studies are aimed at resolving some of the empirical inconsistencies in acculturation as well as ethnic density research outlined above, while making a theoretical and practical contribution towards both of these fields through their integration. The two studies are presented in the subsequent sections following a rationale of the sample selection and general hypotheses.

**Sample selection.** The initial heterogeneous pilot sample of first-generation immigrant students was mostly selected for convenience, and was designed as a platform for the second study, guiding subsequent extensions and serving as a comparison for interpretations. For the second study, a Russian-speaking community sample was chosen given that immigrants from the Former Soviet Union (FSU) have increased dramatically in number and proportion in Western

countries (e.g., Jurcik, Chentsova-Dutton, Jurcikova, & Ryder, 2013b; Mirsky, 2009). In Montreal, the Russian-speaking population has increased considerably in proportion to the general population between the 2006 and 2011 Censuses (Statistics Canada, 2006; 2011). Despite these changes, this group of immigrants has received surprisingly little research attention to date (Hundley & Lambie, 2007; Leipzig, 2006; Jurcik et al., 2013b). Relatively little is known about the mechanisms of ethnic density in this group although some recent studies, as discussed above, have pointed to the possibility that it may moderate acculturation effects in Russians in the US (Birman et al., 2005; Miller et al., 2009). Possibly relevant to ethnic concentration mechanisms is that Russian-speakers tend to value receiving and giving directive instrumental social support – considered to be “in your face” by some – especially when experiencing difficulties (see study 2 for details; Chentsova-Dutton & Vaughn, 2012; for a review see also Jurcik et al., 2013b). Managing to replicate an effect in two divergent samples – one a general immigrant student sample and another a more homogenous community sample of Russian-speaking migrants raises the possibility of universal mechanisms, while any differences obtained could highlight interesting cultural specifics (see Heinrich et al., 2010; Norenzayan & Heine, 2005).

**General hypotheses.** Given previous preliminary research conducted in our laboratory (Ahmed et al., 2011) and a review of the literature, the overarching hypotheses are that heritage acculturation would be protective against psychological distress in contexts of greater (but not low) ethnic density. This is consistent with a person-environment fit theory, or more specifically in this case, ecology-acculturation match. Furthermore, the ED effect would be mediated by increased social support and decreased perceived discrimination. ED was examined at the subjective level (i.e., perceived) in both studies and also at the objective level (i.e., census) for

comparison purposes in the second study. The second study will also extend the first by developing and validating a multi-item measure of subjective ED, and exploring how length of neighbourhood residency, an often overlooked variable, may further moderate ethnic density and acculturation. The research findings will help clarify the role of acculturation within an ecological context, and hopefully set the stage for more ambitious research programmes, explored in the general discussion of the dissertation.

Study 1: Understanding the Role of the Ethnic Density Effect: Issues of Acculturation,  
Discrimination and Social Support

Tomas Jurcik, Rana Ahmed, Esther Yakobov, Liza Solopieieva-Jurcikova, & Andrew G. Ryder

## Synopsis

Ecological factors in psychological acculturation research are often neglected, although recent work suggests that context and acculturation may interact in predicting adaptation outcomes. The ethnic density effect – the protective effect related to a greater proportion of people from the same ethnic group living in a particular neighbourhood – might be one such ecological candidate. The current study integrates these constructs by unpacking the perceived ethnic density effect and examining how it is related to acculturation in a diverse sample ( $N=146$ ) of immigrant students in Montréal, Canada. It was found that the negative relation between perceived ethnic density and depression was mediated by discrimination but not by social support. Furthermore, a cross-over interaction indicated that heritage acculturation was protective against depression for those residing in ethnically concentrated neighbourhoods but not for those living in ethnically sparse neighbourhoods. This strongly supports an ecology-acculturation fit, highlighting the need to contextualize acculturation research.

*Keywords:* Ethnic density, acculturation, discrimination, social support, depression, immigrants

## Understanding the Role of the Ethnic Density Effect: Issues of Acculturation, Discrimination and Social Support

Most psychologists would agree with the statement that immigrants acculturate and function within a sociocultural context. While this may seem like an empty truism, relatively little continues to be known about the interplay between ecological and cultural level phenomena in the clinical manifestations of disorder. Ecological factors such the ethnic composition of neighbourhoods may confer protection as well as risk, and differentially favour certain acculturation styles over others. The purpose of the current study is to further integrate the findings related to neighbourhood ecology, more specifically – perceived ethnic density, with findings obtained in the cultural psychological literatures related to acculturation, discrimination, and social support in immigrants.

### **Unanswered questions in acculturation research**

Numerous researchers have attempted to understand how people experience cultural and psychological change through their interaction with other cultural groups, commonly known as *acculturation*, and how such processes may be related to mental health in immigrants (e.g., Sam, 2006). However, controversial conceptual and operational issues continue to plague acculturation research (Rudmin, 2003, 2009). This is not surprising, given that there is no consistent definition of culture, and researchers continue to grapple with measuring multiple aspects related to acculturation: a sending/heritage culture, a receiving/mainstream one, and possibly even a new or complex emergent identities (Ryder & Dere, 2010). Thus, some researchers view acculturation along one dimension - known as the unidimensional model (e.g., Gordon, 1964; Suinn, Abona & Khoo, 1992), others view it along two orthogonal dimensions (e.g., Costigan & Su, 2004; Ryder, Alden & Paulhus, 2000), and more complex models exist measuring acculturation along three or more dimensions (Flannery, Reise & Yu, 2001). While less research exists on the latter approach,

bidimensional acculturation models have shown greater utility than unidimensional ones. In other words, examining heritage and mainstream dimensions independently yields greater predictive validity than pitting heritage versus mainstream acculturation as polar opposites on a continuum (Ryder et al., 2000). Mounting evidence has accumulated to date showing the superiority of bidimensional models over unidimensional ones, despite some limitations (Schwartz, Unger, Zambaonga & Szapocznik, 2010).

Operationally speaking, *bidimensional acculturation* is the degree to which a bicultural person (e.g., immigrant) identifies with the behaviour, beliefs, and values of the heritage *and/or* the predominant mainstream cultural groups (Ryder et al., 2000). Although these two dimensions are considered to be statistically independent (e.g., Costigan & Su, 2004; Ryder, Alden & Paulhus, 2000), people may identify with both cultural groups simultaneously (Berry, 2006a,b). Immigrants are presumed to select or navigate between cultural identities, often referred to as *acculturation strategies* (Berry, 2006a,b). Those who more closely endorse a mainstream cultural identity (Ryder et al., 2000; Zhang, Mandl, & Wang, 2010), or both heritage and mainstream cultural identities (Berry, 2006b), show better psychological adjustment outcomes. However, the pattern of findings has not been consistent empirically across cultural and demographic groups. For example, it is conceivable that older adult migrants could differ from younger people in what acculturation strategies are most adaptive to their well-being (Schwartz, et al., 2010).

Concurrently, the attitude of minority cultural group members towards the larger society, and that society's policies and attitudes towards migration, may all influence acculturation strategies (Berry, 1997; Berry, 2006a). For example, a pluralistic policy of multiculturalism may encourage identification with both mainstream and heritage cultures while a segregationist approach might foster or even demand maintenance of a heritage cultural identity (see Berry,

2006a). Inconsistent findings between level of acculturation and adjustment outcomes among different ethnic/immigrant groups and settings have also raised questions about how community level contextual factors – such as neighbourhood ethnic composition – might interact with acculturation (e.g., Birman, Trickett & Buchanan, 2005; Schwartz et al., 2010). Thus, the relation between acculturation and adjustment outcomes are far from simple according to the theoretical and empirical literature: some groups may benefit using strategies that may be irrelevant or even problematic to others. The term ‘acculturation strategies’ implies voluntary control, but they at least partly depend on the sociopolitical and ecological setting into which migrants arrive, and in some cases may be outside of personal control (Schwartz et al., 2010).

For instance, mainstream but not heritage acculturation was found to play a role in protecting people from depressive symptoms in groups of ethnic Chinese in Vancouver (Ryder et al., 2000) and Germany (Zhang, Mandl, & Wang, 2010), but the reverse was found recently, with heritage (but not mainstream) acculturation predicting less distress in a visible minority group in Montreal (Ahmed, Jurcik, & Ryder, 2011). Explanations for such differences remain elusive. One possibility is that Vancouver and Montreal are culturally and linguistically different population centers, with Montreal showing more ethnic segregation according to census tract analysis compared to Vancouver (see Balakrishnan, Maxim, & Jurdi, 2005). Thus, heritage acculturation may play a larger role with more recent immigrants in contexts where multiple mainstream groups exist and cultural segregation is more pronounced, as in Montreal, which already includes two mainstream cultural groups – English and French Canadian (Bourhis, Montaruli, Geledi, Harvey, & Barrette, 2010). In turn, mainstream acculturation may be more relevant to mental health in other, perhaps more established minority groups, or in less

segregated contexts, such as the ethnic Chinese in Vancouver. In sum, the inconsistent findings in acculturation research imply that greater attention to context is warranted.

### **Ethnic density effect: Waiting to be explained**

Related clues as to how context may matter to acculturation come from findings obtained in the social psychiatry and epidemiology literatures. One ecological factor that has been receiving increasing interest over the last two decades has been the ethnic density effect (e.g., Whitley, Prince, McKenzie, & Stewart, 2006). The ethnic density (ED) effect relates to the benefits conferred on those who live in neighbourhoods where there is a greater proportion of individuals from the same ethnic background. Although a complex construct, ethnicity is operationalized broadly in this research, often by country of origin (e.g., Pakistan), region and racial group (e.g., Black Caribbean), or along linguistic lines (e.g., Russian speakers). ED can be measured *objectively* (e.g., using actuarial census data) or *subjectively* (i.e., perceived density), with the two approaches yielding moderately correlated indices (Stafford et al., 2009). Although it has to date been studied mostly at the objective level, there is recent interest in examining how perceived ED may also be associated with health (Stafford et al., 2009).

This negative relation between ethnic concentration and disorder has recently been obtained with various immigrant groups studied in the UK (e.g., South Asian, Caribbean, and Irish groups; Das-Munshi, Bécaries, Dewey, Stansfeld, & Prince, 2010; Stafford, Bécaries, & Nazroo, 2009). Specifically, ED has been associated with fewer common mental health disorders (Das-Munshi et al., 2010), fewer psychotic disorders (Boydell et al., 2001), lower rates of alcohol abuse (Bécaries et al., 2011), with mixed findings for long-term illness limiting a person's daily activities (Stafford et al., 2009). In the Canadian context, Malzberg (1964) found that English Canadians living in French-majority neighbourhoods were at increased risk of being hospitalized for a psychotic disorder compared to French Canadians; the same trend was found

for French Canadians where they formed the minority group. More recently, overall immigrant density, a related concept, has been shown to protect Canadian visible minority migrants from depression (Stafford, Newbold, & Ross, 2011). The relation between ethnic or immigrant concentration and outcomes seems to be linear for the most part (e.g., Bécaries et al., 2009, Boydell et al., 2001; Stafford et al., 2010), although curvilinear relationships have also been obtained (Neeleman, Wilson-Jones & Wessely, 2001). On some occasions, greater ethnic density has been linked to poorer outcomes, but this seems to be less common. For example, although Bécaries and colleagues (2009) noted that Bangladeshi and Indian participants reported lower rates of psychotic symptoms in more concentrated neighbourhoods, the reverse was found for Pakistani participants.

Despite nearly eight decades of research, the mechanisms of the ethnic density effect remain unclear (Das-Munshi et al., 2010; Whitley et al., 2006). The term itself may be misleading since studies are generally correlational and thus cannot clearly unravel cause from effect. Nevertheless, ED has been related to decreased discrimination and/or increased social support (Bécaries et al., 2009; Das-Munshi, 2010; Stafford et al., 2010; Whitley et al., 2006; but for a paradoxical finding see Birman et al., 2005), suggesting the possibility that the effects of ethnic density may operate indirectly through such variables. Thus, immigrants living in more concentrated neighbourhoods may encounter less hostility from other groups while also having increased opportunities for various forms of social support. In other words, ethnic density may allow for an increased access to resources and the formation of a larger ethnic in-group, thereby providing a 'psychic shelter' from the discrimination of the majority group (Whitley, 2006). Having a greater proportion of co-migrants may also ease the stress of adaptation into a new environment (cf. Stafford, Newbold, & Ross, 2011). These potential explanations are consistent

with a large and extant body of empirical findings that have linked depression in migrants and minority groups to increased discrimination (Jung et al., 2007; Noh & Kaspar, 2003) and lack of social support (see review by Mirsky, 2009). Thus, the relation between ethnic density and fewer symptoms may operate indirectly through increased social support and decreased discrimination.

Recently, Das-Munshi et al. (2010) attempted to test the discrimination and social support mediation hypothesis for ethnic density but did not obtain an indirect effect. This may, however, have been due to limitations in measurement. Despite using a sophisticated sampling design culling random samples of various ethnic groups, both discrimination and social networks were measured with relatively few categorical items, and participants were dichotomized into groups of people who either had or did not have common mental disorders. Furthermore, objective rather than subjective density was used. Studies comparing objective to subjective measures have also demonstrated predictive advantages for the latter. For example, subjective measures of socioeconomic status are better indicators of health status than objective ones (Singh-Manoux, Marmot & Adler, 2005) and neighbourhood perceptions are more strongly related to distress than neighbourhood location (Christie-Mizell, Steelman, & Stewart, 2003). By extrapolation, perceived ethnic density may correlate more strongly or more consistently with various *other* subjective outcomes, such as distress, perceived discrimination and social support experiences, than objective measures.

### **Acculturation meets ethnic density**

Political factors and attitudes of the majority culture may moderate acculturation (Berry, 2006a). However, it is possible that more micro-level environments such as neighbourhoods also interact with individual acculturation orientations (Birman et al., 2005). Recently, Birman and colleagues (e.g., Birman et al., 2005; Miller et al. 2009) have been examining the link between culture and neighbourhood level factors in Illinois. Their findings suggest that acculturation

levels may interact with immigrant density. For example, Miller and colleagues (2009) found that alienation from American culture in a group of older Russian women migrants in the United States who showed high levels of Russian behavioural acculturation (i.e., observable life style behaviours) was attenuated if these individuals lived in neighbourhoods with a higher concentration of immigrants. In other words, if Russian behaviour took place in an area with a high proportion of immigrants, its negative impact on alienation was not as pronounced. It is possible that these women felt more comfortable expressing Russian ways of behaving in neighbourhoods where there were more immigrants in general.

These findings invite the question of whether the protective effect of heritage acculturation on depression in Montreal (Ahmed et al., 2011) may be enhanced in neighbourhood contexts of higher ethnic density. Such a finding would be suggestive of an ecology-acculturation fit or match (Miller et al., 2009; Schwartz et al., 2010), where the benefits of high heritage acculturation may be further enhanced in ethnically concentrated versus sparse neighbourhoods. That is, immigrants living in a milieu that is synchronous to their cultural values are likely to benefit the most (i.e., show the least amount of distress). In contrast, if the neighbourhood environment does not support their heritage culture identification, heritage acculturation-mental health benefits may be less pronounced. Furthermore, thus far ecology-acculturation research has focused on objective rather than subjective ethnic or immigrant density and has not yet examined mental health (e.g., depression) outcomes. While the mechanisms of the ethnic density effect remain elusive, the interaction between acculturation and ethnic density has also received only very limited research attention to date.

### **Aims and hypotheses**

The current study sought to determine whether a negative relation between perceived ethnic density and depression exists, and whether it can be explained by discrimination and

social support experiences in a group of immigrant University students in Montreal. It also attempted to test whether perceived ethnic density might interact with heritage acculturation for depression; that is, whether perceived ethnic density might enhance the protective relation between heritage acculturation and depression. Given the heterogeneity of the current immigrant sample, objective comparison measures of ethnic density were not examined.

Three sets of hypotheses were derived based on the literature review and previous findings from pilot studies conducted by members of our research group.

(1a) Perceived ethnic density was expected to be related negatively to depression, (b) negatively to perceived discrimination, and (c) positively to social support. (d) Perceived discrimination was anticipated to relate positively to depression, whereas (e) heritage acculturation was anticipated to be related negatively to depression, and (f) social support was also hypothesized to relate negatively to depression.

(2a) Lower discrimination and (b) higher social support were expected to mediate the negative relation between perceived ethnic density and depression.

(3) The relation between greater heritage acculturation and lower depression was expected to be amplified if ethnic density was perceived to be high.

A series of exploratory analyses were run to examine additional potential perceived ED by mainstream acculturation, ED by social support, and ED by discrimination interactions on depression, since it is possible that ethnic density might mitigate or augment effects related to acculturation, discrimination and social support.

## **Method**

### **Participants**

The final sample yielded 146 immigrant university student participants (see Table 1 for demographics). The mean age was 26, and the length of time in Quebec was approximately 9.5 years, with most participants (78%) having lived in Quebec longer than in the rest of Canada. Participants were retained if they identified as first generation immigrants to Canada. Non-immigrant students (including those born in Canada and those on a student visa), immigrants from the United States or those who had at least one parent from Canada or the US were excluded from the study, along with one participant who reported that his responses did not reflect his experience.

### **Procedure**

University student participants at a large English-language University in Montreal, Quebec completed an extensive on-line survey between 2010 and 2012 on adjustment to life in Canada. The study was approved by the institutional review board and participants consented to the study online. Participants either received course credit for an undergraduate psychology course or could win \$50 if not enrolled in a credit-granting course. The study was advertised in the psychology department, on the two University campuses, and by various cultural and immigrant student associations. The measures pertaining to the current study will be presented here and the full scales can be found in Appendix A.<sup>2</sup>

### **Measures**

**Perceived Ethnic Density (variation of Stafford et al., 2009).** Perceived ED was measured using one item to estimate of the participants' neighbourhood ethnic concentration.

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<sup>2</sup> Given the overlap in measurement tools between the two studies of the current research program, Appendix A also includes additional English-language measures used in study 2 (discussed below).

The directions to participants were to “... *estimate how many people from your own ethnic group live in your neighbourhood?*” on a 5-point scale ranging from 1 (*None or hardly any*) to 5 (*Almost all or all of the neighbourhood*). The participants were given examples of traditional names of Montreal neighbourhoods for definition and orientation purposes. The distribution of responses was positively skewed (Table 1), with a majority of participants reporting that they lived in neighbourhoods with none or almost none (37.1%) or only some of the neighbourhood (50.3%) containing their ethnic group. Given the considerable diversity of national groups, this suggests that participants perceived their minority status fairly accurately (list of origin countries available upon request from the authors; see also regional origin in Table 1).

**Vancouver Index of Acculturation (VIA; Ryder et al., 2000).** The VIA assesses heritage and mainstream acculturation (adapted to the French-Canadian context) on two independent subscales (10-items each measuring identical phenomena using a 9-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*). Both subscales are considered to be conceptually and empirically orthogonal (Ryder et al., 2000). A sample heritage item includes “*I often participate in heritage culture traditions*” A mainstream item includes: “*I believe in mainstream French-Canadian values.*” Heritage and mainstream acculturation subscale scores showed good internal reliability coefficients ( $\alpha=.89$  and  $.86$ , respectively).

French-Canadian acculturation was used as the default mainstream culture. The official language of Quebec is French, and since Quebec immigration policies promote French language and Québécois culture in newcomers (referred to as *la francisation des Immigrants*; Immigration et Communautés Culturelles Québec, 2012), many of these students would have attended secondary school or (pre-University) college in French although they were currently studying at an English-language institution.

**Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988).** The MSPSS is a 12-item measure assessing subjective social support in the domain of family, friends and significant others on a 7-point Likert scale (from *Very Strongly Disagree* to *Very Strongly Agree*). A sample item includes “*My friends really try to help me*”. It has been used previously in other studies examining the relation between social support and depression in immigrants (e.g., Ritsner, Ponizovsky & Ginath, 1997). Internal reliability was considered to be high in the current sample ( $\alpha=.94$ ).

**Perceived Discrimination Scale (PERDS; Noh & Kaspar, 2003).** The PERDS is an 8-item measure used to assess subjective experiences related to harassment, specifically in Canada, on a 5-point scale (ranging from *Never* to *All the Time*). A sample item includes, “*In Canada, because of discrimination, have you ever been hit or handled roughly?*” The measure has been associated with depression in immigrants (Noh & Kaspar, 2003) and in the current study it showed adequate internal reliability ( $\alpha=.83$ ).

**Center for Epidemiologic Studies - Depression (CES-D; Radloff, 1977).** The CES-D is a 20-item measure assessing depressive symptoms over the last week on a 4-point scale (ranging from *Rarely or Never* to *Most of the Time*) and has been used in numerous cross-cultural studies (e.g., Ryder et al., 2008). It measures symptoms such as loss of appetite, sleep problems, and loneliness. Internal reliability was excellent for the current sample ( $\alpha=.91$ ).

***Design and Analyses.*** A pairwise correlation matrix was inspected for the first set of hypotheses. Bootstrapping analysis using the method of Preacher and Hayes (2008) was used to test for mediation related to the second hypothesis. Mediation models test whether the relation between an independent variable (X) and dependent variable (Y) can be accounted for by an additional variable(s) (i.e., mediator, M), whereby X is purported to be causally related to M, and

M in turn to Y in sequence. That is, the total effect of X on Y is statistically reduced through an indirect effect of M. Hierarchical multiple regression was used to test for the final moderation (interaction) hypothesis. Moderation analyses examine whether the strength or direction of the relation between X and Y is altered by the presence of an additional variable(s) (i.e., moderator, M). Moderation is statistically equivalent to an interaction effect (see Hayes, 2013, for a detailed discussion on moderation and mediation).

## Results

SPSS Version 20 (IBM, Armonk NY, 2011) was used for the analyses. Missing data was not imputed. However, missing data was dealt with indirectly in the syntax by calculating mean item scores for participants for each measure, and including only those participants who completed at least two-thirds of each multi-item measure. The effect of univariate outliers was examined and the data was left unaltered.<sup>3</sup>

In order to preserve sample size, pairwise correlations were used. The bivariate correlation matrix (Table 2) indicated significant correlations between ethnic density and depression,  $r(136)=-.17, p=.05$ , ethnic density and discrimination,  $r(137)=-.19, p=.03$ , and between discrimination and depression,  $r(138)=.38, p<.01$ . Although social support correlated significantly with depression,  $r(136)=-.29, p<.01$ , it did not correlate with ethnic density,  $r(134)=-.03, p=.73$ . Furthermore, neither heritage,  $r(136)=-.10, p=.26$ , nor mainstream acculturation,  $r(136)=-.15, p=.07$ , were significantly correlated with depression, or with ethnic density,  $r(135)=.00, p=.99$  for heritage, and  $r(135)=.06, p=.52$  for mainstream acculturation.

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<sup>3</sup> Between one and three univariate outliers were identified (more than three but less than four z-scores from the mean) for MSPSS, ED, and QVIA-H and age. However, after adjustment, they did not alter the pattern of results, and hence the original analyses are presented.

A mediation model was tested using only perceived discrimination as the mediator between ethnic density and depression, but not social support, as social support did not correlate with ethnic density. Since neither age, gender, nor household income were associated with depression, background variables were not included in either the mediation or moderation models. For the test of mediation ( $N=138$ ), a bootstrap test with 5000 re-samples was used (Preacher & Hayes, 2008). This test has been found to be more powerful than other traditional tests of mediation, especially with small and non-normal distributions. An indirect effect (-.0462,  $SE=-.0263$ ) of Ethnic Density to Perceived Discrimination to Depression was obtained. Percentile 95% Confidence Intervals (CIs) (-.1051 to -.0016), along with the other two CIs did not include (but were close to) zero, indicating statistically significant mediation (see Figure 1).

For the test of moderation (perceived ethnic density by heritage acculturation interaction for depression), a hierarchical multiple regression was conducted. Main effects were entered in Block 1 and interaction terms were added in Block 2. In order to preserve sample size, perceived ethnic density was collapsed into two groups: low (none or hardly any people from the participant's ethnic group;  $n=53$ ) or high (some or more people from the participant's ethnic group;  $n=90$ ). Table 3 presents standardized beta ( $\beta$ ), semi-partial correlations ( $sr$ ),  $t$ , and related probability ( $p$ ) values. Since the perceived ED effect is small in size, it was no longer significant after other variables were included in the regression model. Although social support,  $\beta=-.20$ ,  $t(129)=-2.39$ ,  $p=.02$ , and perceived discrimination,  $\beta=.29$ ,  $t(129)=3.49$ ,  $p < .001$ , were significant in step 1, only social support remained significant in step 2,  $\beta=-.24$ ,  $t(125)=-2.10$ ,  $p=.04$ . Moreover, the ethnic density by heritage acculturation interaction was also significant in the second step,  $\beta=-.30$ ,  $t(125)=-2.25$ ,  $p=.03$ . Exploratory analyses revealed there was no

interaction between ED and mainstream acculturation for depression, as well as between ED and social support and between ethnic density and discrimination.

The perceived ethnic density by heritage acculturation interaction for depression is presented in Figure 2, without including other variables. The cross-over interaction suggested that the protective relation of heritage acculturation on depression scores was limited to those living in high ethnically dense neighbourhoods, and reversed for those in low ethnically dense neighbourhoods, leading to increased symptoms. This pattern was confirmed by examining simple effects for the high ED group  $\beta = -.27$ ,  $t(83) = -2.56$ ,  $R^2 = .07$ ;  $p = .01$ , and the low ED group  $\beta = .20$ ,  $t(49) = 1.41$ ,  $R^2 = .04$ ,  $p = .16$ . Thus, increasing heritage acculturation was related to significantly decreasing symptom scores for those in the higher density group, but there was a non-significant trend for increasing symptom scores for those in lower concentrated neighbourhoods.

### **Discussion**

The current study attempted to test discrimination and social support as mechanisms underlying the link between ethnic density and depression, and whether ethnic density could augment the protective relation between heritage acculturation and depression. Our predictions were partially supported. For the first set of hypotheses, perceived ED correlated negatively with depression and discrimination, but not positively with social support as we had expected. Discrimination was related positively to depression, and negatively to social support, confirming the hypotheses. However, neither heritage nor mainstream acculturation was significantly correlated with depression. For the second hypothesis, the negative relation between ethnic density and depression was indeed mediated by perceived discrimination as anticipated, but not

by social support. Finally, as expected, ethnic density moderated the heritage acculturation-depression relation. High heritage acculturation was protective in high ED contexts.

### **Ethnic density effect mediated by discrimination**

This may be the first study showing a relation between perceived ethnic density and depression partially mediated by perceived discrimination. In contrast, Das-Munshi et al. (2010) did not find mediation effects between (objective) ethnic density and common mental disorders. Our study differed in that it used perceived ethnic density, focused on one disorder (i.e., depression vs. common mental disorders), used more graded or extensive measurement (e.g., continuous rather than dichotomous measures for depression, and a more detailed measure of discrimination) but a less sophisticated non-random sampling method. Subjective indicators may be better predictors of distress than objective ones (Christie-Mizell et al., 2003; Singh-Manoux et al., 2005) and it is possible that this finding generalizes to ethnic density as a predictor of mental health.

Although discrimination played a mediating role in the ethnic density-depression relation, it was surprising that social support did not correlate with ethnic concentration. This finding contrasts with suggestive qualitative (Whitley et al., 2006) and quantitative findings (Das-Munshi et al., 2010). Nevertheless, Das-Munshi et al. (2010) also failed to find an indirect effect of social support between ethnic density and common mental disorders. It is thus possible that social support may be less relevant to ethnic density than was previously believed, compared to the role of protecting new migrants from day-to-day discrimination. Social support may be obtained from other sources unrelated to the neighbourhood, especially in the era of the internet and Skype connections, where immigrants can relatively easily keep in touch with friends and family in other countries (Ross, 2010). On the other hand, the current study may have been

underpowered to find an indirect effect of social support and requires replication in larger samples. Future studies may also wish to explore the effect of long-distance social support on immigrant adjustment.

While immigrants may have more flexibility in choosing when and from where they get their support, it may be more difficult to avoid experiencing discrimination in ethnically sparse neighbourhoods. For example, due to convenience, immigrants may fall back on utilizing their neighbourhood resources for grocery shopping, banking, recreational and other activities. Frequently venturing beyond one's neighbourhood for resources may be expensive and time consuming (Whitley et al., 2006), especially for student immigrants, some of whom may be living on more modest budgets. In such cases, discrimination may be more likely encountered in ethnically sparser neighbourhoods, whose members may be less aware or tolerant of minority immigrant groups. However, ethnic density did not augment the effects of social support or mitigate the relation of discrimination on depression, which would also have been conceivable. This supports the specificity of the mechanism in the current sample: ethnic density was associated with less depression indirectly through reduced discrimination. Given that partial mediation was obtained, other potential mediators may need to be examined in future studies (e.g., social capital; Das-Munshi et al., 2009; Whitley et al., 2006).

### **Matching ethnic density with heritage acculturation**

This study also expands upon the importance of studying acculturation research from an ecological “fit” perspective (see Birman et al., 2005; Miller et al., 2009). The significant cross-over interaction indicated that a good *fit* or *match* (Schwartz et al., 2010) between ethnic density and heritage acculturation (i.e., high-high or possibly low-low) was related to less depression (Figure 2). In contrast, a lack of fit between acculturation and ethnic density (e.g., low-high) was

related to higher levels of symptoms. A concordance between heritage acculturation and perceived neighbourhood ethnic concentration may be beneficial for immigrants, where their beliefs and behaviours are reflected and reinforced in their environment. The current findings suggest that increased depressive symptoms may occur in individuals who do not identify with their heritage culture, but for whatever reason find themselves in an ethnically dense (i.e., ‘mismatched’) neighbourhood that on a day-to-day basis may not reflect such values and behaviours. While simple effects for the low ethnic density group were only trending (perhaps due to the smaller subsample), it seems possible that people who identified with their heritage culture but instead lived in a low ethnically dense environment may have experienced dissonance leading to an increased likelihood of depressive symptoms.

Miller and colleagues (2009) also obtained an interaction effect but it was less pronounced, and limited to immigrant rather than ethnic concentration. However, these researchers examined Russian behavioural and American identity acculturation, with both variables having positive and negative relations with alienation, respectively, despite the moderating effect of (objective and overall) immigrant density. In contrast, the current study examined subjective ethnic concentration in a heterogeneous group of immigrant students, examined overall heritage acculturation (instead of behaviours or identity per se), and depression as an outcome variable rather than alienation. It is possible that extensive subjective measures of overall acculturation and depressive symptoms (rather than feelings of alienation) may be more sensitive to moderation effects, especially by another subjective rather than objective construct (i.e., ethnic density).

The current study’s findings also differ somewhat from Birman and colleagues (2005), who found that mainstream acculturation (in this case American identity) interacted with ethnic

density, where Russian high school students with greater *American* identity in *high* concentrated Russian neighbourhoods in Chicago performed better at school. Their explanation was that there may have been a pull towards assimilation in the denser neighbourhoods. However, this also took place in a different context with different samples and measures. Since Canada's policy leans less towards assimilation and more towards multiculturalism (see Berry, 2006a) where pluralism of heritage cultures is placed at a premium, there may be less of a push towards mainstream assimilation in the Montreal sample. This explanation is consistent with the finding that mainstream acculturation did not play a moderating role on ethnic density in our study while it did in Chicago (see also Miller et al., 2009). It is also curious that the Birman et al. participants reported *more* discrimination in ethnically dense neighbourhoods, which goes against the findings here and in the general literature (e.g., Bécares et al., 2009; Das-Munshi et al., 2010; Whitley et al., 2006). However, these discrepancies call for replication with the same measures in different contexts.

It was also unexpected that neither heritage nor mainstream acculturation would significantly correlate with depression scores in the current sample (cf. Ryder et al, 2000). However, we found heritage (but not mainstream) acculturation to be moderated by perceived ethnic density, and a recent study examining visible minority students in Montreal found heritage acculturation to be a significant predictor of adjustment (Ahmed et al., 2011). Other studies have found mainstream acculturation to be a better predictor instead (Ryder et al., 2000; Zhang et al., 2010). These variations between samples and contexts are difficult to explain. While different ethnic groups do not adjust in the same way (Das-Munshi et al., 2010), as mentioned in the introduction, it is also possible that heritage acculturation may play a larger role with more recent immigrants in contexts where multiple mainstream groups exist and cultural segregation is

relatively more pronounced, as in Montreal (see Balakrishnan et al., 2005; Bourhis et al., 2010). In turn, mainstream acculturation may be more relevant to mental health in less segregated contexts with only one dominant culture.

Finally, the findings add to the extant literature suggesting that social support protects immigrants from depression (e.g., Mirsky, 2009; Ritsner et al., 1997) even though social support was found to be independent of ethnic density in the current study, and also, that discrimination in minority groups is a risk factor for poor mental health outcomes (e.g., Kaspar & Noh, 2003; Jung et al., 2007). Overall, the current student immigrant sample corroborated patterns obtained in community studies.

### **Limitations, Strengths, and Future Directions**

Some notable limitations need to be addressed. First, we conveniently sampled a select heterogeneous and predominantly female undergraduate immigrant student population, which limited generalizability. In contrast, Das-Munshi et al. (2010) randomly sampled specific ethnic groups in the community, and noted that the ethnic density effect may be operating differently in the various sub-groups. On the other hand, the patterns of associations obtained in the current sample are similar to those found in community groups (e.g., Bécares et al., 2009; Mirsky, 2009; Noh & Kasper, 2004; Jung et al., 2007) suggesting the sample may serve as a useful model.

A second limitation is the correlational design, which is obscuring the direction of effect. The term, 'ethnic density effect,' implies that a higher ethnic concentration somehow leads to less distress but other explanations are also possible. For example, once people become depressed in neighbourhoods with a greater ethnic concentration, they may tend to move to more ethnically sparse neighbourhoods. Longitudinal studies may help resolve directions of causality questions by regularly keeping track of immigrant movement between neighbourhoods and symptom scores. Third, ethnic concentration was perceived, in the absence of comparison

objective measurement (cf. Stafford et al., 2009) and other neighbourhood level variables that may have acted as potential mediators (e.g., neighbourhood disorder and capital). Objective ethnic density was not measured in the current sample due to its considerable heterogeneity. However, subjective and objective ethnic density have previously been found to be moderately correlated (Stafford et al., 2009), and given the positively skewed distribution of responses in the current ethnically diverse sample, perceived ethnic concentration may have been a fairly accurate marker of objective density. Further research will be needed to compare the predictive power of subjective compared to objective ethnic density. Finally, it is possible that ethnic density also plays a role in protecting immigrants in other non-neighbourhood settings (e.g., workplace, academic life) that have yet to be evaluated. We are currently collecting more extensive community data in the Montreal area, which is less gender-biased and more representative in socioeconomic status, including the over-sampling of the Russian-speaking immigrant community to overcome some of the above shortcomings.

Despite its limitations, the current study also makes some notable contributions. First, although a potential sampling concern, the ethnic density effect prior to this study has to our knowledge not yet been closely examined with a diverse immigrant student sample. Second, it is an addition to the very few studies that have sought to empirically unpack the ethnic density effect, and perhaps the first study to unpack the *perceived* ethnic density effect. This study is to our knowledge the first to show a significant mediation effect of discrimination partly explaining the relation between perceived ethnic density and depression. This is a notable contribution supporting the utility of subjective indicators, which may be better predictors than objective ones (e.g., social status on health; Singh-Manoux, Marmot & Adler, 2005).

The current study also makes a contribution to acculturation research that has to date generally been studied without much attention to contextual variables. Given the perceived ethnic density-acculturation interaction, the current findings along with those of others (Birman et al., 2005; Miller et al., 2009) may motivate psychologists to incorporate neighbourhood level data such as ethnic concentration when studying processes of acculturation and adjustment.

Our findings also have clinical and policy implications in need of further investigation. Primary prevention programs may utilize and evaluate educational and sensitizing interventions focusing on reducing discrimination in ethnically dispersed neighbourhoods (see also Birman et al., 2005; Miller et al., 2009). The effectiveness of clinical ecological interventions that encourage distressed immigrants to live in or more frequently visit neighbourhoods concordant with their acculturation style may also generate interesting findings, but should not be used to foster segregation and undermine primary prejudice prevention programs.

Currently, some clinical textbooks suggest the importance of assessing unidimensional acculturation (i.e., heritage to mainstream on one scale) for treatment planning (e.g., Paniagua, 2005). However, evaluating bidimensional acculturation may be a more useful approach (Ryder et al., 2000), assessed in combination with patient ecology (e.g., perceived neighbourhood ethnic concentration) to better contextualize challenges and resilience related to mental health. For example, clinicians in community settings treating depressed immigrants may hypothesize a ‘mismatch’ between heritage acculturation level and perceived ethnic density and consider testing such an assumption with available measures. Investigation of such an approach could advance the clinical utility of acculturation scales.

## **Summary**

The current study found that the negative relation between perceived ethnic density and depression was mediated by reduced perceived discrimination, but not by increased social support. The relation between heritage acculturation and reduced depression applied for those residing in high but not low ethnic density neighbourhoods. These findings build on the recently emerging literature attempting to explain the mechanisms of the ethnic density effect, and highlight the importance of fit between acculturation and ecological factors for improved mental health. The clinical utility of assessing perceived ethnic density in the context of bicultural acculturation with immigrant clients needs to be further explored.

## Linking study 1 to study 2

The initial study with a heterogeneous group of migrants showed an indirect effect of reduced discrimination for the protective perceived ethnic density-depression relation. Furthermore, a match between ED and heritage acculturation appeared to be associated with less depression. It has been one of the very few studies examining mechanisms of the ED effect in the context of acculturation research. Indeed, it was likely the first published study to unpack mediating mechanisms of the perceived ED effect. However, generalizations and specific cultural group inferences are limited with the heterogeneous student sample which may not be representative of any specific group. Thus, our pilot study had several limitations: other than sample heterogeneity, a single item was used to estimate perceived ED, and objective measurement was unfeasible given the hyper-diversity of the sample. Further, only one measure of symptoms (depression) and only one of social support was used. The latter was also unexpectedly unrelated to ED.

To counter these limitations, the subsequent community study used a relatively understudied population, Russian-speaking immigrants from the Former Soviet Union (FSU) to Montreal. We attempted to replicate and extend the findings by using an extended measure of perceived ethnic density, additional measures of problem-focused social support and family coping, as well as an additional moderating variable, the length of neighbourhood residence. Moreover, the brief multi-item measure of perceived ED was validated against a census-level measure of mother-tongue linguistic density. Since the two samples represented in the two studies are different, any similar patterns of findings might suggest some level of universality (Norenzayan & Heine, 2005), while disparities might shed light on unique cultural differences. The findings will serve as a platform guiding future research programmes on social ecology and acculturation.

Study 2: Unraveling ethnic density effects, acculturation, and adjustment: the case of Russian-speaking immigrants from the former Soviet Union

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## Synopsis

There has been limited advancement in the empirical literature unpacking the ethnic density effect, a social ecological phenomenon which in turn may help explain some of the conflicting findings in bidimensional acculturation research. In this cross-sectional study we developed a brief measure of perceived local area ethnic density in a community sample of Russian-speaking immigrants ( $N=269$ ) from the former Soviet Union in Montreal, Canada, finding it to be a superior predictor of distress to objective linguistic density. An indirect effect of acquiring social support partly explained the relation between perceived ethnic density and lower distress. Furthermore, the relation between heritage acculturation and distress was moderated by perceived ethnic density and time lived in the neighbourhood. A person-ecology fit involving heritage acculturation and ethnic density was related to better psychological adjustment for participants who had resided in their neighbourhood for less than two years. However, longstanding neighbourhood residents in low ethnic density neighbourhoods appeared relatively vulnerable. Neither mainstream acculturation nor objective ethnic density played a moderating role. Clinical and community research implications for using measures of perceived ethnic density and bicultural acculturation measurement are discussed.

*Keywords:* Russian-speaking immigrants, ethnic density effect, acculturation, adjustment, social support, discrimination.

## Unraveling ethnic density effects, acculturation, and adjustment: the case of Russian-speaking immigrants from the former Soviet Union

A once common belief in North American social science was that, “without understanding social structures, personal troubles cannot be solved” (Oishi, Kesibir, & Snyder, 2009, p. 339). However, in recent decades the empirical literature in social and cultural psychology has been relatively devoid of contextualizing research in social-ecological systems, such as institutional and neighbourhood environments. For instance, only limited empirical work has been conducted to examine how immigrant acculturation may interact with environmental contexts, despite a long and rich tradition of acculturation research in psychology and anthropology (e.g., Redfield, Linton, & Herskovits, 1936; Berry, 2006a,b).

There has also been a burgeoning and parallel epidemiological literature since the 1930s investigating the ethnic density (ED) effect – the finding that minority groups have better adjustment outcomes if they live in areas with a greater proportion of people of the same ethnicity (e.g., Das-Munshi et al., 2012; Faris & Dunham, 1939). Although the acculturation and ethnic density literatures rarely intersect or inform one another (for recent exceptions, see: Jurcik, Ahmed, Yakobov, Solopieieva-Jucikova, & Ryder, 2013; Kwag, Jang & Chiriboga, 2012; Miller et al., 2009), a collaboration between ecologically and culturally minded researchers might shed light on the inconsistencies permeating acculturation research (e.g., Trickett, Persky, & Espino, 2009) and on clarifying the mechanisms of the ED effect (see Shaw et al., 2012). Community psychology, with its ecological focus may thus inspire acculturation research with a missing contextual link (Trickett et al., 2009).

As an extension of a preliminary student immigrant study (Jurcik et al., 2013a), the current research attempts to further bridge this gap by exploring the effects of acculturation and

perceived ethnic density on adjustment in Russian-speaking immigrants from the Former Soviet Union (FSU), a traditionally under-studied but growing minority group in North America. We will begin, however, by separately exploring some of the gaps in acculturation and ethnic density research and then examine how the two literatures might be linked to fill these lacunae.

### **Acculturation research: What is it good for?**

There have been numerous inconsistencies across studies in operational conceptualizations of acculturation, fueling a theoretically and empirically contentious topic (e.g., Rudmin, 2009; Schwartz, Unger, Zamboanga, & Szapocznik, 2010; Trickett et al., 2009). The more simple, unidimensional models view acculturation as an assimilation process to the mainstream cultural context (e.g., Suinn, Ahuna & Khoo, 1992) but have been found to be conceptually and empirically lacking in explanatory power compared to bidimensional perspectives (e.g., Ryder et al., 2000; Schwartz et al., 2010). Given two conceptually independent dimensions, acculturation can thus be broadly construed as the degree to which migrants adapt and/or maintain the beliefs, values, and behaviours associated with both *mainstream* and *heritage* cultural contexts. Additional dimensions may emerge – for example, a third or fourth cultural affiliation (e.g., Persky & Birman, 2005) – although less research has been conducted with more than two dimensions.

Immigrants can experience acculturative stress and there has also been extensive research showing how different acculturation ‘strategies’ are related to mental health outcomes, an important question for policy makers and clinicians alike (Berry, 2006b; Sam, 2006). The most popular model posited by Berry (e.g., 2006b) suggests that *integration* of both mainstream and heritage cultures is the most psychologically adaptive, while the most problematic reflects *marginalization* from both cultural self-identities. Those who engage in *separation* (from the

mainstream culture) and *assimilation* strategies fall between these two extremes. However, the evidence is not always so clear-cut – under some environmental and psychological conditions, one type of acculturation style may be more adaptive than another type (Schwartz et al., 2010). For instance, in Vancouver, the adjustment of minority students was dependent on mainstream but not heritage acculturation (Ryder et al., 2000; a similar effect was found in Germany, Zhang Mandl & Wang, 2010). Contrast this with Montreal, the setting of the current study, where heritage acculturation played a role as a predictor or moderated predictor in the adjustment outcomes of a diverse group of immigrants, but not mainstream acculturation (Ahmed, Jurcik, & Ryder, 2011; Jurcik et al., 2013a). With its two mainstream cultural groups (i.e., English- and French-Canadian) and greater segregation, Montreal may foster the salience of heritage culture affiliations compared to Vancouver (see Balakrishnan, Maxim, & Jurdi, 2005). In other studies, even outright rejection of a particular cultural identification may be considered to be plausibly adaptive (e.g., Schwartz et al., 2010). Thus, Muslim participants in Toronto were at increased risk of depressive symptoms when identifying with the mainstream culture, but were protected through their heritage culture affiliations (Asvat & Malcarne, 2008).

Along with a heavy reliance on University student samples, the general measurement inconsistencies and differential findings in acculturation research across contexts, ethnic groups, stages of development and generational statuses, have led to considerable ambiguity and obfuscation in the acculturation literature (see Rudmin, 2009; Trickett et al., 2009). The lack of a clear message has likely been less than useful at the front-line level; clinicians working with minority groups rarely use acculturation measures, and when they do so they favor simplified unidimensional ones (see Paniagua, 2005). Given the numerous methods of assessing acculturation, some community psychologists have referred to the acculturation literature as

“confusing, contradictory, and non-cumulative” (Trickett et al., 2009, p. 268). Even less flattering, Landrine and Klonoff (2004, p. 530) argue that the “evidence is so incoherent that it is unintelligible, and hence it continues to be largely useless to health psychology and behavioral medicine.”

This state of the science is unfortunate. A major concern with acculturation research is that it is often decontextualized (Trickett et al., 2009). One potential solution to this lacuna is to gather more evidence about moderating factors, which may lead us towards a better understanding of if, and when, acculturation plays a predictive role. Perhaps sociopolitical climate at the macro level (e.g., Berry, 2006a) as well as city and neighbourhood environments at lower levels (e.g., Jurcik et al., 2013a) shape the acculturation process, thereby favoring or demanding some ‘acculturation strategies’ over others. Indeed, the term ‘strategies’ may be misleading by overemphasizing personal choice at the expense of contextual influences (see Schwartz et al., 2010). Among neighbourhood variables such as socioeconomic status and neighbourhood deprivation, ethnic density or immigrant concentration has shown promise as a moderator of the effects of acculturation on mental health (Jurcik et al., 2013a; Kwag et al., 2012; Miller et al., 2009). This contextual variable among others may help researchers understand the disparate findings within the acculturation literature. The following sections will examine attempts to unpack the mechanisms of the ED effect and its potential relation to acculturation.

### **Making sense of ethnic density**

Although psychologists have traditionally neglected social contextual factors in mental health, this trend appears to be reversing in recent years (e.g., Juang & Alvarez, 2011; Jurcik et al., 2013; Kwag et al., 2012; Miller et al., 2009; Syed & Juan, 2012). For considerably longer periods, epidemiologists in social psychiatry have made important advances in showing the

importance of local area contexts (e.g., Bécaries, Nazroo, & Stafford, 2009; Das-Munshi et al., 2010, 2012; Shaw et al., 2012). The ethnic density effect is one such variable – living in a neighbourhood with a greater proportion of people from the same ethnic group is associated with lower levels of physical or mental health problems. Faris and Dunham (1939) originally demonstrated this effect when they examined psychiatric hospitalizations in Black and White patients depending on neighbourhood composition in Chicago. Since that time, ED has been studied in various groups and settings and has been found to be protective against physical problems, psychosis, and common mental disorders/symptoms (e.g., Bécaries et al., 2009, 2012; Jurcik et al., 2013a; Stafford, Bécaries, & Nazroo, 2009; Das-Munshi et al., 2010, 2012; Shaw et al., 2012).

ED can be measured objectively as well as subjectively and the two indices are moderately correlated (Juang & Alvarez, 2011; Stafford et al., 2009). Much less research has been conducted with perceived ED until recently (e.g., Jurcik et al., 2013a; Stafford et al., 2009; Juang & Alvarez, 2011; Kwag et al., 2012; Syed & Juan, 2012). Given that perceptions of socioeconomic and environmental states tend to correlate with mental health outcomes better than objective ones (e.g., Christie-Mizell, Steelman, & Stewart, 2003; Singh-Manoux, Marmot & Adler, 2005), there is reason to believe that perceived ED will also be more strongly associated with other subjective experiences empirically (e.g., perceptions of cultural resources; Juang & Alvarez, 2011).

The literature has not always been consistent in demonstrating the benefits of ethnic density, however. In some cases, a higher likelihood of negative health outcomes has been found. Thus, ED was detrimental for Pakistani, but not Indian or Bangladeshi, participants with respect to psychosis in the UK (Bécaries et al., 2009). A recent review showed that although the majority

of studies on mental disorders have obtained a protective effect, a number of neutral findings (i.e., no effect) have also been obtained, along with a smaller proportion of studies demonstrating a reverse effect: for example, with some visible minority adolescent samples (Shaw et al., 2012).

While the mechanisms of the ED effect remain unexplained, researchers have recently suggested that social support and discrimination might mediate ED, and that the latter moderates discrimination and social support (e.g., Bécares et al., 2009; Das-Munshi et al., 2012; Jurcik et al., 2013a; Syed & Juan, 2012; Whitley et al., 2006). With potentially augmented opportunities for support and less exposure to concomitant discrimination when surrounded by co-ethnics, ED has been hypothesized to offer a ‘psychic shelter’ for immigrants (Whitley et al., 2006). Increased social support, and decreased discrimination in ethnically dense areas (measured objectively), have indeed been shown to be protective for people from various South Asian ethnic groups in the UK against psychosis (Das-Munshi et al., 2012). ED has also moderated the effect of racism on physical health outcomes (Bécares et al., 2009). In Montreal, a perceived ED effect for depression was shown to operate via lower discrimination (but not more social support) in a heterogeneous group of immigrant students, many of whom had visible minority backgrounds (Jurcik et al., 2013a; for contrasting findings see Birman, Trickett, & Buchanan, 2005; Juang & Alvarez, 2011). This latter study may be the only one to date to statistically demonstrate an indirect effect of discrimination between perceived ED and depression. Thus, recent evidence suggests that discrimination and social support may be avenues that deserve further attention as potential mechanisms of the ED effect.

### **Ethnic density meets acculturation: Favoring a good match**

While the mechanisms of the ED effect remain to be clarified, ethnic density may help contextualize acculturation processes. Acculturation does not take place in a vacuum – the

process and effects of acculturation are ecology-dependent. For instance, the acculturation patterns for FSU émigrés varied in two US counties with differing levels of ED (Birman et al., 2005). For a group of women from the FSU, behaviours related to Russian heritage were associated with greater alienation from American culture, but this effect was mitigated when living in areas with high (non-specific) immigrant concentration (Miller et al., 2009). In another study, older Hispanic adults were more prone to depressive symptoms if they were not affiliated with the mainstream culture (using a measure of unidimensional acculturation); moreover, depressive symptoms were further aggravated in ethnically dispersed neighbourhoods (Kwag et al., 2012). Thus, ethnic density may act as a moderator of the acculturation-adjustment link according to the emerging evidence.

More recently and relevant to the current study, in a pilot project with immigrant students we found that heritage, but not mainstream, acculturation was associated with less depression in Montreal – yet only in those who lived in neighbourhoods with high perceived ethnic density (Jurcik et al., 2013a). Those who did not identify with their heritage culture but who lived in a high ED neighbourhood had a nonsignificant trend for increased symptoms. This pattern is consistent with an ecology-acculturation fit or ‘match’ model (Jurcik et al., 2013a). That is, those who match on heritage acculturation and neighbourhood ED (high-high or low-low) have a mental health advantage over those who mismatch (low-high or high-low). Similar findings have suggested that a fit between family and personal heritage acculturation is better for mental health than a mismatch (Asvat & Malcarne, 2008). Heritage acculturation may have thus possibly acted as a confounder in adolescent minority samples in the US and Canada who showed poorer adjustment outcomes with greater ED (see Shaw et al., 2012). Adolescents may be lower on

heritage acculturation than their parents and thus respond in kind to an ethnically concentrated (i.e., mismatched) environment.

A further overlooked variable that may moderate the ED effect itself is the length of time lived in a neighbourhood. The perceived benefits of a neighbourhood environment likely take time to establish (e.g., social cohesion). Thus, very recent arrivals to a local area may have had less opportunity to benefit from the effect than more established residents. We are not aware of published research to date exploring such a moderating effect.

In sum, acculturation needs to be examined in the context of ecological systems for findings to be of greater coherence. The inconsistencies in the ethnic density and acculturation literatures will likely be difficult to resolve without accounting for both variables simultaneously. Understanding contextual considerations may be of further practical utility to clinicians and policy makers who need to know under what circumstances (i.e., when, where and with whom) bidimensional acculturation may play a protective – or detrimental – role.

### **The adjustment of Russian-speaking immigrants in Montreal**

There has been an influx of Russian-speaking immigrants since the collapse of the former Soviet Union to North America (Lashenykh-Mumbauer, 2005) and other Western countries (Mirsky, 2009). In Montreal alone, the population of Russian speakers has increased by almost 29.5% between 2006 and 2011 while the overall population of the city grew by about 5.2% (see Statistics Canada, 2006, 2011). Despite these striking demographic shifts, Russian immigrants are relatively neglected in cultural, community, and clinically meaningful research (e.g., Hundley & Lambie, 2007; Jurcik, Chentsova-Dutton, Solopieieva-Jurcikova, & Ryder, 2013). This relatively educated immigrant group is not immune to acculturative stress and adaptation difficulties, however (e.g., see Jones & Trickett, 2005; Jurcik et al., 2013b for review).

Additionally, this population is of considerable theoretical interest since it primarily represents a non-visible minority group and may be distinct from East Asian cultural groups that have been more commonly studied, as well as Euro-American samples (see Jurcik et al., 2013b). For instance, rather than supporting autonomy, Russians tend to emphasize direct and unsolicited instrumental (or “in-your-face”) social support more so than Euro-Americans (Chentsova-Dutton & Vaughn, 2012, p. 690). Often migrating as families, findings demonstrate that Russians who enjoy social (including family) support are protected against depression (Mirsky, 2009). While our previous study exploring ED and acculturation was limited by its highly heterogeneous sample composition (Jurcik et al., 2013a), our focus here on Russian-speakers allows us to study a group that shares a common language, history, practices and meanings despite its diversity (see Jurcik et al., 2013b for review). Given their growing number, shared experiences, and common as well as unique aspects of their adaptation challenges, we determined that Russian-speaking immigrants to Montreal were good candidates for helping us better understand the interrelation of acculturation and ED.

### **Aims and hypotheses**

The aim of the current study is three-fold. First, we hope to extend our previous findings (Jurcik et al., 2013a) by clarifying the mediating mechanisms of the perceived ED effect in a more homogeneous sample of Russian speaking immigrants. Second, we will examine whether both subjective and objective ED, as well as length of neighbourhood residence can contextualize acculturation-adjustment outcomes. Third we will test whether a brief composite measure of perceived ED is correlated with an objective indicator.

***Correlational hypotheses.*** These were developed in preparation for the mediation analysis and in order to validate the composite subjective ED measure against objective ED.

Perceived ED will thus be negatively associated with symptoms (as measured by distress and depression) and discrimination, and positively with social support (as measured by two social support scales); in turn social support will be negatively associated with distress and discrimination will be positively associated with distress. We also anticipate that objective linguistic density (proxy for objective ED) will show a similar pattern, albeit with weaker effect sizes, and be related to subjective ED.

***Indirect effect hypotheses.*** The negative association between perceived ED and distress will be *mediated* by decreased discrimination and increased social support.

***Moderation (interaction) hypotheses.*** The association between heritage acculturation and distress will *depend* on levels of perceived ethnic density. Thus, an acculturation-ecology *match* between perceived ED and heritage acculturation (i.e., high on both or low on both variables) will be associated with less distress than a *mismatch* (e.g., high-low). We also expected for the protective association between ED to be amplified by years resided in the neighbourhood. Moreover, we examined a potential three way interaction between heritage acculturation, ED and years resided in the neighbourhood.

Three exploratory models will examine analogous effects to the moderation hypotheses by replacing heritage with mainstream acculturation as a moderator of the relation between ED and distress (e.g., Kwag et al., 2012), and examine whether ED moderates effects of social support and discrimination (e.g., Bécares et al., 2009). Finally, perceived ED will be replaced with objective linguistic density in the final set of exploratory analyses retesting the moderation hypotheses described above.

## **Method**

### **Participants**

The final sample comprised 269 participants. Demographic information is provided in Table 1. The mean age was 34.2 ( $SD=7.70$ ), and 68% of the sample was female. Most participants were immigrants from Russia or Ukraine (60%). Participants had lived in Canada for a mean of about 5 years, and a vast majority of participants lived with someone (89%), generally family. Most of the participants found out about the study through online sources (72.5%) and chose to complete the survey in Russian (77%) rather than English (23%). Participants were retained if they were Russian-speaking and born in the FSU, migrants to Canada currently living in Montreal, and if they indicated that they responded honestly to the survey questions.

### **Procedure**

Immigrants living in Montreal completed an extensive on-line survey between 2011 and 2012 on the psychosocial adjustment to life in Canada (the current study analyzed a subset of the measures). We oversampled Russian-speakers in the community by making the study available in Russian and English languages, and by advertising in both languages through various online (e.g., Craigslist, Russian forums) and print media (i.e., Russian newspaper) as well as to immigrant community centers and to the parents of children attending Russian schools; others had been informed about the research via personal acquaintances of the researchers (see Table 1 for referral source). In order to promote snowball sampling, participants were encouraged to inform acquaintances and family; however, only one participant per household was permitted to participate. The study was confidential and participants consented to the study online.

Instruments were translated into Russian by an experienced translator (L.S.-J.) and verified by two native speakers (including E.Y.). Measures that had been obtained from existing sources were also verified. Participants had the option of completing the survey in Russian or in

English and entered a raffle for five prizes of \$100 which was drawn after completion of the study. The University institutional review board approved the research.

## **Measures**

Alphas are presented as a whole collapsed across language versions. The full scales can be found in Appendix A in English and their translations into Russian in Appendix B. Following some basic demographic questions, the participants proceeded to the measures.

### **Perceived Ethnic Density - Composite (ED; extension of Stafford et al., 2009).**

Perceived ED was measured using a four-item scale to estimate the participants' neighbourhood ethnic concentration. Participants were asked to think of their local area (15-20 minutes walking distance from their home), and for the first item, to estimate "*what proportion of all the people in this local area are of the same ethnic group*" as the participant on a 5-point scale ranging from *None or hardly any* to *Almost all or all of the local area*. Three additional items were developed, asking participants to what extent in their local area they had access to ethnic "*specialty products*" such as food, "*resources and organizations*" such as community centers related to their ethnic group, and whether they could get by and be understood in their native language in their area. Also on a 5-point scale, these items ranged from *Not at all* to *A large extent*. Higher mean item scores for the four items combined reflected greater overall perceived ED. The scale was found to have adequate internal consistency ( $\alpha=.73$ ).

**Objective Ethnic Density.** Russian linguistic density was the proxy used for objective ED and was calculated at the level of the Forward Sortation Area (FSA; the first three digits of Canadian postal codes), which represent relatively small neighbourhood districts. Census data (Statistics Canada, 2011) were used to determine the proportion of inhabitants who declared Russian to be their mother tongue (numerator) to the total number of inhabitants (denominator)

within the FSA. Although the range was low (.00 to .08), objective linguistic density was found to be positively correlated with perceived ED,  $r(247)=.46, p<.001$ .

**Vancouver Index of Acculturation (VIA; adapted from Ryder et al., 2000).** The adapted VIA assesses heritage and mainstream acculturation (i.e., French-and English Canadian) on three independent scales (10-items each measuring identical experiences using a 9-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*). Heritage and mainstream subscales are considered to be conceptually and empirically orthogonal (Ryder et al., 2000). A sample heritage item is: “*I enjoy the jokes and humor of my heritage culture.*” A sample mainstream item is: “*I believe in mainstream English-Canadian values.*” In order to obtain a single measure of mainstream acculturation the highest item score for either French or English mainstream acculturation were retained. Heritage ( $\alpha=.84$ ) and mainstream acculturation ( $\alpha=.85$  for both English and French) subscale scores showed good internal reliability.

**Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988).** The MSPSS is a 12-item measure assessing general subjective social support in the domain of family, friends and significant others on a 7-point Likert scale (from *Very Strongly Disagree* to *Very Strongly Agree*). A sample item is: “*My friends really try to help me.*” It was used to explore the association between social support and depression in a previous study with Russian immigrants (Ritsner, Ponizovsky & Ginath, 1997). Internal reliability was excellent for the current sample ( $\alpha=.93$ ).

**Family Crisis Oriented Personal Scales (F-COPES; McCubbin, Olsen & Larsen, 1996).** The F-COPES comprises 29-items that explore effective family coping strategies related to difficulties from five domains: Acquiring Social Support (AcSS; 9 items,  $\alpha=.79$ ), Mobilizing the Family to Accept Help (MFAM; 4 items;  $\alpha=.84$ ), Seeking Spiritual Support (SPIRIT; 4 items,

$\alpha=.84$ ), Reframing (REFR; 8 items,  $\alpha=.76$ ), and Passive Appraisal (PA; 4 items,  $\alpha=.63$ ). The first three represent an active, external coping factor and the second two an internal factor. The scale uses a 5-point Likert scale from *Strongly Disagree* to *Strongly Agree*. Sample items from the AcSS dimension are: “*sharing concerns with close friends*” and “*receiving gifts and favors from neighbors*.” SPIRIT dimension was modified slightly to be more encompassing since the original scale assumed a Christian belief system. “*Participating in religious/spiritual activities*” is an item from this dimension. A sample item for MFAM is: “*seeking assistance from community agencies and programs designed to help families in our situation*”. Sample items for PA and REFR respectively are: “*watching television*” and “*showing that we are strong*.” Internal consistency was acceptable for the total score ( $\alpha=.78$ ).

**Perceived Discrimination Scale (PERDS; Noh & Kaspar, 2003).** The PERDS is an 8-item measure used to assess subjective experiences related to discrimination specifically in Canada, on a 5-point scale (ranging from *Never* to *All the Time*). A sample item is: “*In Canada, because of discrimination, have you ever been treated unfairly?*” The measure has been associated with depression in Korean immigrants (Noh & Kaspar, 2003) and in the current study it showed excellent internal reliability ( $\alpha=.93$ ).

**General Health Questionnaire (GHQ-12; Goldberg, 1992).** The GHQ-12 assesses general psychiatric morbidity using 12-items on a 4-point scale (responses vary from *Not at all* to *Much more than usual*) that are related to a broad range of psychiatric symptoms in the past two weeks (e.g., *lost much sleep over worry, been losing confidence in yourself*). Internal reliability was adequate in the current sample ( $\alpha=.78$ ). A Russian version of the scale was used (Ponizovsky et al., 2007).

**Center for Epidemiologic Studies - Depression (CES-D; Radloff, 1977).** The CES-D is a 20-item scale assessing depressive symptoms over the last week on a 4-point scale (ranging from *Rarely or Never* to *Most of the Time*) and has been used in Russia (Dershem, Patsiorkovski, & O'Brien, 1996). More specific than the GHQ, examples of items include poor appetite, sadness, and loneliness. Internal reliability was excellent for the current sample ( $\alpha=.91$ ).

**Design and Analyses.** A list-wise correlation matrix was examined for the first set of hypotheses, along with General Linear Model (GLM) to test whether ED was a significant overall predictor of distress (CES-D and GHQ) and social support (MSPSS and AcSS). Bootstrapping analysis (with 5000 resamples; Hayes, 2013; Preacher & Hayes, 2008) was used to test for mediation related to the second set of hypotheses, and hierarchical multiple regression was used to test for the final moderation (interaction) hypotheses and three-way test: here ED was dichotomized (high vs. low) along with years lived in the neighbourhood (less than 2 years vs. more than two years). Post-hoc analyses probing distress in different subgroups of ethnic density and length of neighbourhood residence were controlled for alpha inflation using Tukey's HSD. Exploratory moderation tests (e.g., using objective instead of perceived ED, and discrimination and social support instead of acculturation) were also conducted.

## **Results**

All analyses were conducted in SPSS version 20 (IBM Corp., 2011) and mediation analyses were conducted using PROCESS (Hayes, 2013), a macro derived for SPSS. PROCESS and SPSS allow for bootstrapping, a statistical method that is more robust with samples which may not meet assumptions of inferential statistics (Preacher & Hayes, 2008). Univariate outliers were winsorized to 3.3 standard deviations from the mean with rank order preserved. Three multivariate outliers were identified using the Mahalanobis distance cut-off,  $\chi^2(13)=34.53$ ,

$p < .001$ , and were deleted. Missing data for the items related to the measures in the correlation table and years of neighbourhood residency was not extensive (between 0 and 2.6% for items) and completely at random, having passed Little's MCAR test,  $\chi^2(7833) = 7916.17, p = .25$ .

Imputations were not conducted but mean item scores were calculated in the syntax for participants who completed at least two-thirds of each multi-item measure. Listwise  $N$ s are reported for the analyses related to the hypotheses.

For the initial hypotheses the zero-order correlation matrix (see Table 2), revealed numerous small effects associated with perceived ED (composite). It showed that ED was a significant predictor of reduced general distress and greater problem-focused social support, although ED was not significantly related to depression, general social support, or discrimination. Both general and acquired social support were related to less distress, while discrimination was positively related to depression but not general distress. ED was also significantly related to the other external patterns of F-COPES, seeking spiritual support and mobilizing family, but not to the internal patterns of passive acceptance and reframing. Objective linguistic density did not yield correlations other than with perceived ED (see measures) and was not included in the table.

Two Multivariate GLMs were conducted to examine whether perceived ED could predict overall symptoms (GHQ-12 and CES-D) and overall social support (AcSS and MSPSS). ED was revealed to be a significant multivariate predictor for overall social support,  $F(2,262) = 3.50, p = .03$ , Wilks'  $\lambda = .974, \eta_p^2 = .026$ ; however, it was only a significant univariate predictor of F-COPES-AcSS,  $F(1,263) = 6.95, \eta_p^2 = .026, p = .01$ , and not MSPSS,  $F(1,263) = 1.32, p = .25$ . Similarly, ED showed a significant multivariate effect for psychological distress,  $F(2,265) = 3.31, p = .04$ , Wilks'  $\lambda = .976, \eta_p^2 = .024$ , but ED was only a univariate predictor for GHQ-12,  $F(1,266) = 6.43, p = .01, \eta_p^2 = .024$ , and not CES-D,  $F(1,266) = 1.42, p = .23$ . It was thus determined

that it would be acceptable to use only GHQ-12 and F-COPES AcSS in the subsequent mediation and regression analyses. Neither age, gender, nor household income were correlated with GHQ-12; background variables were therefore not used as covariates in the models.

For the second set of hypotheses, the bootstrapped mediation analysis (see Figure 1) indicated that the relation between perceived ED and distress was partly explained by a significant indirect effect of acquiring social support, as percentile-corrected 95% confidence intervals (CI) did not include zero. Given that all F-COPES external coping variables (acquiring social support, spiritual support, mobilizing family) correlated with perceived ED and distress, we explored whether they could significantly mediate the perceived ethnic density effect overall (i.e., when collapsed into one factor). The indirect effect ( $-.0258$ ,  $SE=-.0107$ ) for this external coping model was also significant, percentile corrected 95% CIs  $[-.0494, -.0076]$ . However, given the marginal increase in the indirect effect for the external factor over the simple mediation model of acquiring social support alone, the additional two variables (spiritual support, mobilizing family) did not display significant indirect effects in a multiple mediation model assessing the three external variables simultaneously and separately (i.e., in parallel).

For the test of moderation hypotheses (see Table 3), a hierarchical multiple regression was conducted. Main effects were entered in Block 1 and two-way interaction terms were added in Block 2, and the three-way interaction in Block 3. In order to preserve adequate group sizes and better visualize interactions, perceived ED was collapsed into two approximately equal groups, low (mean item score of equal or less than  $.25$ ,  $n=128$ ) or high (mean item score of more than  $.25$ ,  $n=137$ ); similarly, years lived in the neighbourhood (originally an ordinal variable) was also split into approximately equal groups of low (less than 2 years,  $n=145$ , hereafter termed ‘recent residents’) or high (more than 2 years,  $n=120$ , hereafter termed ‘established residents’).

Table 3 presents standardized beta ( $\beta$ ), semi-partial correlations ( $sr$ ),  $t$ -test ( $t$ ) and related probability ( $p$ ) values. The overall model was significant  $F(7,257)=2.26, p=.03$  and accounted for 5.8% of the variance (3.2% adjusted). Here, the hypothesized two-way interactions, perceived ED by years resided in the neighbourhood and ED by heritage acculturation, were only marginally significant. However, the ED by heritage acculturation interaction was significantly moderated by length of neighbourhood residence in the third step. Portrayed in Figure 2, the ED by heritage acculturation interaction for recent residents is found in the left panel and for established residents in the right panel.

### **Post-hoc and further exploratory analyses**

Follow up one-way ANOVAs were conducted to determine whether the four sub-groups treated as levels of an independent variable (recent residents: Low ED,  $n=71$ , and High ED,  $n=74$ ; established residents: Low ED,  $n=58$ , and High ED,  $n=63$ ) differed on any of the measures used in the zero-order correlation matrix (i.e., Table 2 measures treated as outcome variables). To limit Type I error, Tukey HSD tests were examined following a significant result on inspection of one-way between subjects ANOVA (see Table 4). For four out of the six significant comparisons obtained (all  $ps<.05$ ), the Low ED group for established residents was different from another group. For GHQ-12 symptoms, the Low ED established residents had higher scores than the High ED established residents. Analogously, the Low ED established residents also appeared more symptomatic on the CES-D than the High ED established residents. The Low ED established residents also reported more discrimination than the Low ED recent residents, as well as less general social support (MSPSS) than the latter. In sum, the Low ED established residents appeared to show a pattern of greater vulnerability.

Despite being more symptomatic, the downward slope in Figure 2 (right panel) suggested that the low ED established residents were protected by heritage acculturation. Exploratory moderation analyses confirmed that heritage acculturation buffered the effects of low social support [ $R^2_{\text{ch}}=.09$ ,  $F(1,53)=7.06$ ,  $p=.01$ ] and marginally buffered the effects of discrimination [ $R^2_{\text{ch}}=.06$ ,  $F(1,53)=3.63$ ,  $p=.06$ ] on distress. This interaction did not hold for the other three subgroups.

Analogous exploratory two- and three-way ED moderation analyses to those presented in Table 3 were probed by first replacing heritage with mainstream acculturation (VIA-M), then by social support (F-COPES and MSPSS), and finally by discrimination (PERDS). None of these yielded significant interactions. Replacing perceived ethnic density with objective linguistic density in the models also did not yield significant moderation results. Since none of these exploratory interactions were significant, no corrections for alpha inflation were made.

## **Discussion**

The current study aimed to unpack the ethnic density effect and assess acculturation in ecological context in first generation Russian-speaking immigrants from the FSU. The findings partly supported the hypotheses. For the first set, objective linguistic density and perceived ED were positively related, but as expected, perceived measurement was a better predictor in this small sample; the objective indicator did not correlate with any of the outcome variables. Thus, perceived ED was related positively to overall social support and was protective against overall psychological distress. However, although discrimination was a risk for distress, perceived ED was unrelated to perceived discrimination.

For the second set, the indirect effect hypothesis was partly supported: problem-based acquired social support (but not general support or discrimination) mediated the relation between

perceived ED and distress. Approaching significance for the third set of hypotheses, the perceived ED effect was amplified by length of neighbourhood residence, and ethnic density marginally moderated the relation between heritage acculturation and distress.

More importantly, however, a significant three-way interaction qualified the marginal two-way interactions; a match between levels of ED and heritage acculturation (high-high or low-low), rather than a mismatch (e.g., high-low), was suggestive of less distress for participants who resided in the neighbourhood for *less* than two years. This finding was consistent with our original moderation hypothesis: the cross-over interaction (Figure 2, left panel) was analogous to what we obtained in our previous study (Figure 2 in Jurcik et al., 2013a). In contrast, at *more* than two years of residence, the pattern changed: those in lower ED neighbourhoods showed more symptoms and psychosocial vulnerability (increased discrimination and less social support) relative to other groups but appeared to benefit from heritage acculturation as a buffer. Objective ED and mainstream acculturation played no moderating role.

### **Acculturation in ecological context**

In combination with our pilot study (Jurcik et al., 2013a) it appears that a fit or match between neighbourhood ethnic ecology and heritage acculturation is predictive of better adjustment for diverse immigrant groups, at least at some points in time. Notably we obtained an analogous cross-over interaction pattern in two separate groups – a heterogeneous group of immigrant students (Jurcik et al., 2013a) and currently a community group of Russian-speaking immigrants. Obtaining similar findings with considerably different populations suggests the possibility of a universal phenomenon (Norenzayan & Heine, 2005). However, this conclusion needs to be tempered by the three-way interaction in the current study.

The current findings also highlight some of the discrepancies in the ethnic density (e.g., Shaw et al., 2012) and acculturation literatures (e.g., Trickett et al., 2009). For instance, studies showing that minority adolescents may be placed at risk in ethnically dense neighbourhoods (reviewed in Shaw et al., 2012) could potentially have been confounded by the possibility that younger immigrants may have had lower heritage culture affiliation compared to their parents (i.e., a mismatch between heritage acculturation and ED; see also Asvat & Malcarne, 2008). Using a similar logic, heritage acculturation may also have been a risk factor in studies (e.g., Kennedy et al., 2005) for those persons who lived in less ethnically dense neighbourhoods. Although these interpretations are speculative, our findings strongly suggest that acculturation should be measured in context with perceived ED.

Match mechanisms implied that personal values (i.e., level of heritage acculturation) should be consistent with ecologies (i.e., neighbourhoods of certain ethnic concentrations), in order to facilitate adjustment (e.g., Jurcik et al., 2013a). A mismatch may create dissonance which manifests itself in psychological maladjustment (see also Asvat & Malcarne, 2008). Although this was not a longitudinal study, this mechanism could be present for more recent neighbourhood residents when individuals may be especially sensitive to their environments (e.g., perhaps in transition periods as with recent immigrants and students). At later points, other mechanisms may become relevant. Groups living in less concentrated neighbourhoods may become affected by general difficulties encountered by immigrants over time, such as accumulated discrimination experiences and difficulties in renewing social support, further aggravated in cases of limited heritage culture affiliation. Perhaps reflecting an unsuccessful assimilation attempt in individuals willing to shed their heritage culture by moving to lower ED neighbourhoods, the findings imply a cumulative risk mechanism, possibly indicative of

inadequate ‘psychic shelters’ in such neighbourhoods (Whitley et al., 2006; see also Das-Munshi et al., 2010, 2012). Whatever the reason, our results strongly indicate that future research needs to explore ED effects in the context of not only acculturation, but also the length of neighbourhood residency.

While mainstream acculturation played a modest role in the correlation matrix predicting adjustment, it did not interact with perceived ED (as in our previous study, Jurcik et al., 2013a), suggesting that a match is more relevant with respect to heritage acculturation for improved adjustment. On the other hand, since Montreal represents a unique cultural and linguistic context, it is also possible that in other (e.g., less segregated) settings or even for groups in other parts of the city, ED may moderate the effects of mainstream acculturation (see Kwag et al., 2012).

#### **Unpacking ethnic density: One size does not fit all**

It is theoretically interesting that active (rather than general) social support played a mediating role in the current sample, given that Russians may give practical “in-your-face” social support, especially when encountering problems (Chentsova-Dutton & Vaughn, 2012; see Jurcik et al., 2013 for review). Such active support could potentially be harnessed in more concentrated areas, allowing Russians to benefit from this effect. Moreover, the ED effect may be partly explained by a combination of effective external coping mechanisms associated with family challenges (acquired social cohesiveness, mobilizing family to accept help and spiritual involvement), although only acquired social support was a significant mediating mechanism when considered separately. Perhaps in some minority cultural groups, local area ED effects operate mostly through friends, neighbours, and family if available in times of crisis. Instead, general social support (i.e., MSPSS) played no mediating role, and neither did decreased discrimination as in our previous study (Jurcik et al., 2013a). In contrast, our previous sample

contained a greater proportion of visible minority participants. Ethnic density has been inconsistently related to discrimination: sometimes more (Birman et al., 2005; Juang & Alvarez, 2011), as well as less (Das-Munshi et al., 2012; Bécares et al., 2009), depending on group and setting. Perhaps ED does not operate via reduced discrimination in populations that are more likely to blend in with the mainstream; in this case, people of mostly Eastern European descent in a city with a strong European influence (Montreal) may not stand out in appearance and custom in contrast to other ethnic groups (for contrasting findings, see Birman et al., 2005). There are likely other variables that could play an additional role in explaining the ED effect (e.g., familiarity effects, enhanced cognitive efficiency during times of crisis). FSU migrants have also shown a tendency to preserve their cultural affiliations through Russian media and other sources (Kozulin & Venger, 1995) and thus may benefit from ethnolinguistic vitality (Landry & Bourhis, 1997). These findings and conjectures imply that ED mechanisms are not of the “one-size fits-all” variety, need to be culturally informed, and deserve further unpacking in future studies with various populations and settings.

### **Objective versus subjective indicators**

Linguistic density (objective ED proxy) had no predictive role in the current sample, but this may be due to power issues which have plagued numerous studies (Shaw et al., 2012). On the other hand, our findings are in line with research that has shown that subjective social variables may be better predictors of experience than objective ones (e.g., Christie-Mizell et al., 2003; Singh-Manoux et al., 2005), including a recent study that found subjective ethnic density to correlate with perceived availability of community resources (Juang & Alvarez, 2011). Objective measures may thus be less connected to subjective experience, especially in smaller samples with limited power. It is also conceivable that perceived measurement may be more

strongly associated with other subjective measures due to shared error variance. Nonetheless, the robust correlation which emerged between perceived and objective measurement indicated that our subjective measure had adequate construct validity.

### **Limitations and Strengths**

The current study utilized a relatively small non-random sample, and methods of advertising (e.g., internet, reward) may have encouraged some members of the community to participate rather than others. For example, although there were multiple pathways to participation, the majority of the sample was female. Second, participants completed English or Russian versions of the survey which may have lacked complete equivalence, although internal consistency was good and we did not attempt to interpret mean differences across language versions. Third, we examined length of neighbourhood residence, but since the study was cross-sectional, causality cannot be inferred (e.g., migrants may move to less ethnically dense neighbourhoods following stress associated with their ethnic group). The study was also potentially prone to recall bias (e.g., more distressed individuals may perceive less access to social support).

In contrast, to our knowledge this is the first study to examine ethnic concentration and acculturation phenomena in Russian-speaking migrants in Montreal. Consistent with the literature highlighting active social support in Russian-speakers (Chentsova-Dutton & Vaughn, 2012), it may be the first to show that this variable partly explained the indirect effect of perceived ED on distress. Together our two studies (Jurcik et al., 2013a) demonstrate that ED effects likely operate through different mediators depending on group. By partly replicating and extending previous findings (Jurcik et al., 2013a), we have also highlighted universal ecology-acculturation match mechanisms, and the importance of incorporating length of neighbourhood

residency as a moderating variable in ED research. We hereby add to the growing psychological literature suggesting the importance of neighbourhood contextualization of acculturation research (e.g., Birman et al., 2005; Jurcik et al., 2013a; Kwag et al., 2012; Miller et al., 2009).

### **Future directions: Community and clinical research implications**

Although the ethnic density effect has been studied for nearly 80 years, the mechanisms continue to be elusive (e.g., Shaw et al., 2012). Longitudinal and mixed methods studies in multiple cities (see Whitley et al., 2006) may generate new insights and further unpack these mechanisms across groups and settings.

The perceived ED findings, and their associated moderating effects, are small but deserve future attention. For example, Figure 2 (left panel) indicates approximately a .4 point difference on the GHQ-12 between high and low ED groups at lower levels of heritage acculturation. The mean item difference of .4 by 12 items represents about *five* points of the total score. The GHQ-12 threshold for caseness (i.e., presence of psychiatric morbidity) varies between studies, but is about three points (see Goldberg et al., 1997). This indicates that some people may be especially sensitive to an ecology-acculturation match. Perhaps individual differences such as personality traits or emotion regulation abilities may further moderate those who benefit the most from such a fit. For instance, perhaps those with limited emotion regulation abilities may have even greater difficulties in mismatched settings.

In terms of immigrant resettlement policy, the findings of the current and our previous study (Jurcik et al., 2013a) suggest that it may be beneficial if authorities sensitize immigrants (e.g., through brochures) to issues of ethnic density and heritage acculturation, thereby encouraging migrants to make a settlement choice reflecting a person-environment fit. Further research is needed to clarify effective models of prevention in neighbourhoods of varying ethnic

concentration, and based on our findings, may differ depending on community sample and context. In some cases, community prevention may require sensitization of the general public against discrimination, in others, fostering family crisis oriented support may be more relevant. Additionally, the role of perceived ED in other frequented settings (e.g., the workplace) has yet to receive research attention to date (Jurcik et al., 2013a).

Little is known about the ED effect in clinical settings, and research in this area may further establish whether interventions related to patient ED levels might have clinical utility (i.e., given that diminished levels have been linked to elevated rates of psychosis and other mental disorders; Das-Munshi et al., 2010, 2012). Clinical researchers investigating smaller samples may easily incorporate brief subjective measures of ED, especially when access to objective measurement is less feasible. The current study adds to the mounting evidence that bidimensional measurement is likely to reveal findings obfuscated by unidimensional scales, but needs to be considered in ecological context (see Trickett et al., 2009).

Our results may also inform clinical findings from the therapist-client ethnic matching literature. Meta-analyses have shown negligible outcome differences for ethnic matching (e.g., Cabral & Smith, 2011), but our findings and those of others (Asvat & Malcarne, 2008) imply that perhaps a match/mismatch between heritage acculturation levels of both therapist and client could also be considered in predicting outcomes. Issues of matching aside, many other basic practical interventions related to stabilizing recent immigrants or refugees likely deserve priority, such as establishing safety and effective links with institutions and the mainstream society (e.g., Rousseau, Pottie, Thombs, Munoz, & Jurcik, 2011), as well as enhancing family based coping directly, as indicated in the current study.

## **Conclusion**

There is much potential in reconsidering social ecological factors in the cultural and social psychological literatures. This study demonstrated that the relationship between heritage acculturation and psychological adjustment is complex but meaningful, and may depend on levels of ethnic density and length of neighbourhood residence. Whereas a match between heritage acculturation and ethnic density may play a role at earlier phases of neighbourhood residence, a different relation may operate for more longstanding residents. We also found that the relation between higher perceived ethnic density and decreased psychological distress partly operated via acquiring social support during family difficulties. Future longitudinal research may attempt to replicate the current findings and shed light on the clinical utility of measuring perceived ethnic density and acculturation in clinically distressed immigrants. Since it has been difficult to resolve the acculturation debate without accounting for context, we hope that this work will further inspire researchers to consider a social ecological approach to acculturation.

## General discussion

In recent decades there has been a sparsity of structural and social ecological variables in social and cultural psychology research (Markus & Hamedani, 2007; Oishi et al., 2009; Van de Vijver & Leung, 2000), while epidemiological studies have often neglected individual difference variables such as psychological acculturation. In an attempt towards bridging this gap, the current pair of studies aimed to ecologically contextualize acculturation research and unpack the perceived ethnic density effect. The findings indicated that the mechanisms for the perceived ethnic density effect may vary between samples. While both groups appeared to report better adjustment in greater ethnically dense local areas, in the first heterogeneous group of immigrant students, discrimination appeared to be a significant mediator (study 1, figure 1), and in the second Russian group, it was acquiring social support as a family for problem situations (study 2, figure 1). Furthermore, the heritage acculturation-adjustment relation was significantly moderated by ethnic density in the first group, and was double moderated in the Russian sample by ethnic density and length of neighbourhood residence. Notably the analogous cross-over interactions (study 1, figure 2; and study 2, figure 2 left panel) indicated that an *ecology-acculturation match* between heritage acculturation and ethnic density is relevant in enhancing immigrant adjustment. A match between ethnic density and heritage acculturation (e.g., high-high) might suggest that the values of the local area would more likely reflect one's heritage affiliation than a mismatch (e.g., high-low). This matching mechanism may have been replaced by a *cumulative risk mechanism* for more longstanding residents in low ED neighbourhoods. That is, established low ED residents appeared to have experienced augmented discrimination and reduced general social support, possibly compounded in some cases by low heritage

acculturation placing residents at increased risk of distress. Finally, it was notable that objective density (study 2) or mainstream acculturation did not play a moderating role.

### **Search for mediating mechanisms**

As a moderator, perceived ethnic density may alter the acculturation-adjustment relation. However, the protective main effect of ethnic density on mental health found in the literature also deserves unpacking (e.g., Shaw et al., 2012), by examining the purported causal mechanisms (i.e., mediators) through which this effect operates. Researchers have suggested that the beneficial effect of ethnic density on mental health may operate via reduced discrimination and augmented social support (e.g., Das Munshi et al., 2010, 2012; Whitley et al., 2006). While the current studies partly support this view, they also suggest that the mediators of the perceived ED effect vary between groups. It is theoretically interesting that discrimination played a mediating role in one group with participants who were primarily from visible minority backgrounds, and acquiring social support played a similar role in primarily ethnic European Russian-speakers from the FSU. For the first case, ED may have been protective against negative social interactions with the majority group (i.e., discrimination) that perhaps are more likely to be experienced by visible minority groups in dispersed areas. In the second case, the mechanism is suggestive of acquired social cohesion during crisis situations, such as receiving assistance from neighbours and relatives, but may possibly extend to external coping in general (i.e., acquired social support, mobilizing family to seek institutional assistance, seeking spiritual guidance such as attending a place of worship). It also implies a cultural specific mediator, given that tangible and active support is especially valued by Russians (Chentsova-Dutton & Vaughn, 2012). While the current discourse in the social psychiatry and epidemiology literature appears to imply universal mechanisms, or at least does not focus on culturally specific ones (see e.g.,

Whitley et al., 2006; Das-Munshi et al., 2012), differences between the current studies suggest that group specific or at least culturally informed mediators deserve further investigation. For instance, given the importance of informal contacts in Russian society, ED effects may operate via social networking which could lead to work opportunities or other material or social resources, including access to culture brokers (see Jones & Trickett, 2005; Jurcik et al., 2013b). As we concluded in our second study, the adage that “one size does not fit all” applies to our findings. Given that our mediating variables did not fully account for the variance between perceived ethnic density and symptoms, a search is warranted for testing the role of other potential mechanisms. Subsequent studies could benefit from utilizing additional variables that might be informed by extant findings in cultural and community psychology (see also Future Studies, below).

### **Objective vs. Perceived Ethnic Density**

In our second study we obtained a sizable correlation between subjective and objective indicators of ethnic density. However, we obtained significant total, as well as moderating and mediating effects using perceived rather than objective density. This may simply be a reflection of the relatively small sample compared to those used in epidemiological studies (Bécares et al., 2012), and would not be inconsistent with numerous studies that have found a neutral (i.e., absent) effect (Shaw et al., 2012). On the other hand, as was argued earlier, it is possible that perceived measures correlate better with other subjective experiences such as self-report of symptoms. There are very few published studies available comparing objective to subjective measurement of ED, although at least one other study obtained a stronger correlation with perceived compared to objective ethnic density using other (non-mental health) outcome measures (see Juang & Alvarez, 2011).

Utilizing perceived measures of ethnic density is more amenable to small sample clinical research and assessment during routine clinical practice. On the other hand, subjective measurement reflects bias and may be conflated with personal experience (as with the current study, correlations between the two forms of measurement are generally  $r < .5$ ; Juang & Alvarez, 2011; Stafford et al., 2009). For instance, having a friendly neighbour of the same ethnic background may be more salient than an unknown cluster of co-ethnics several streets away (see Stafford et al., 2009). Hence, smaller studies that mainly focus on subjective measurement may choose to use an objective check for perceived ED as was done in our second study.

### **Further thoughts on the issue of ecology and acculturation**

The partial replication of the ED-heritage acculturation moderation effect in a culturally and demographically disparate sample (e.g., the Russian sample was older and more recent) suggests that an ecology-acculturation fit mechanism may operate for various immigrant groups (see Heine & Norenzayan, 2005). In addition to the current set of studies, the importance of heritage acculturation match with family environments has been documented in a Muslim group (Asvat & Malcarne, 2008) and if further replicated elsewhere may be suggestive of a functional universal (see Heinrich et al., 2010; Norenzayan & Heine, 2005).

It is still unclear how such a match operates. One hypothesis is that a person-environment fit may reduce cognitive dissonance, or level of discordance between intersubjective (community) and personal values (see Chiu et al., 2012). In turn, chronic discordance could lead to stress and depressive symptoms. A complementary hypothesis is that cognitive resources may be freed in matched compared to non-matched neighbourhoods, spurring the pursuit of pertinent adaptation goals. It is also an empirical question whether a person living in an environment that does not match his or her values may encounter more interpersonal conflict, or may need to

devote additional attentional resources to identifying and regulating negative emotions (see below).

Ethnic density and ecology-acculturation interaction effects are small (see also Kwag et al., 2012), but individual differences may also further influence a person-environment fit. For example, examining the difference between fit lines in Study 1 (Figure 2) some individuals could differ by approximately .7 points on the CES-D between high and low ED groups at lower scores of heritage acculturation. That is, a mean item difference score of .7 by 20 items represents a total score difference of 14 points. This score is comparable to the CES-D cut-off for mild and significant symptoms of 16 points (Radloff, 1977). Similarly, as was pointed out, at lower levels of heritage acculturation in study 2 (Figure 2, left panel) a .4 point mean item difference on the GHQ-12 between high and low groups represents 5 points of the total score (i.e., .4 by 12 items). The GHQ-12 cut-off for caseness varies, but is relatively low at only about 3 points (see Goldberg et al., 1997). These findings indicate that some individuals may be especially sensitive to an ecology-acculturation match.

It is possible that stable factors such as personality, including neuroticism or introversion, may further differentiate individuals who would be most affected by mismatches. Depression research further suggests that some individuals may be better at utilizing emotion regulation strategies than others (Moriya & Takahashi, 2012). Therefore, perhaps an ecology-acculturation mismatch could be aggravated further for those with greater difficulties regulating negative emotions or for those high on vulnerable personality traits (e.g., neuroticism).

Both study samples showed similar ecology-acculturation fit patterns at least at some points in time (see Figures 2 in both studies). One explanation for this concordance is that both groups were experiencing a transition period. Perhaps people are especially sensitive to their

environments during more dynamic developmental periods (e.g., adjusting to the demands of adulthood or a new neighbourhood setting). In contrast, other mechanisms may come into play at later developmental time points once psychosocial elements in the person's life have become more settled and stable.

The match mechanism thus did not seem to apply for Russian immigrants who were established in their neighbourhood for more than two years (study 2, Figure 2, right panel): here it appeared that those in low ethnic density group were indeed generally more symptomatic (study 2, Table 3), consistent with what much of the literature suggests (Shaw et al., 2012; Bécares et al., 2012). This longer standing ethnically dispersed group may have had difficulty managing discrimination experiences and limited social support than their more recent neighbourhood counterparts. It is important to note that they did *not* experience more discrimination or less general social support than the high ED group (i.e., discrimination was not a mediator). Moreover, the symptoms of the longstanding dispersed group were amplified for those scoring low on heritage affiliation. In other words, this pattern could potentially represent a cumulative risk profile (i.e., accumulation of negative experiences in the context of limited protective factors) and is not mutually exclusive with the possibility of a problematic or blocked assimilation attempt (see Wimmer, 2013). That is, some Russian migrants may have made an attempt to assimilate by moving to less ethnically concentrated neighbourhoods and even shedding their heritage culture, but simultaneously did not manage to augment mainstream cultural ties compared to the high ED group. Participants living in low ED areas who at least strongly identified with their heritage culture were buffered against discrimination experiences and against diminished general social support (see Study 2, Figure 2, right panel). In contrast, the longer standing residents in the high ethnically dense group seemed to no longer experience such

a buffering effect, perhaps because they already reached a floor due to protective factors. These post-hoc interpretations are of course speculative partly since cause and effect cannot be unravelled from the cross-sectional design. How these ED by acculturation patterns unfold would best be clarified in a longitudinal study examining immigrant settlement patterns.

Nevertheless, what this research programme has indicated is that acculturation experiences are to be contextualized within ethnic ecology, and possibly sheds light on the inconsistencies in the acculturation literature. Analogously, ethnic density effects depend on heritage acculturation, possibly highlighting why a minority of groups show detrimental effects associated with greater ED (Shaw et al., 2012). In short, since acculturation does not proceed in a vacuum it should not be divorced from ecological phenomena such as ethnic density, and vice versa.

#### **Future studies: A return to social structures and ecology**

The current studies made an attempt to recognize that although individual acculturation processes may be a psychological phenomenon, this experience needs to be contextualized by social ecology. Ethnic density is one such ecology variable, but there are many others such as neighbourhood disorder which incorporates physical and social ecology (e.g., crime, pollution, social disorganization, socioeconomic deprivation; Hill, Burdette, & Hale, 2009), access to institutions and services, sociopolitical and workplace climates, which could be studied alone or in combination (see Stokols, 1992, for examples of social ecology variables). For instance, living in an ethnically dispersed local area, which also happens to be deprived or disordered, may further compound the negative effects of an acculturation-ethnic density mismatch, while living in a more affluent neighbourhood might mitigate it. Again, contextual factors could shape the process of acculturation and may be measured at the subjective and/or objective level.

Future studies would also benefit from taking longitudinal and cross-cultural approaches, by comparing ethnic density effects across different settings, ethnocultural groups, age, gender and generational groups, given that ethnic density mechanisms may not be uniform (Bécares et al., 2012), and since parents may have different patterns of acculturation compared to their children (e.g., Asvat & Malcarne, 2008). As was noted earlier, unlike Montreal, Vancouver or Toronto are less segregated (Bakhasarian et al., 2005), and therefore mainstream acculturation might play a more prominent role in interacting with ethnic density (see Ryder et al., 2000; Kennedy et al., 2005). Thus, such studies could also utilize multiple sites in various Canadian cities. These multisite methodologies would lend themselves to more advanced statistical techniques such as multilevel modelling in larger samples (see Bécares et al., 2012). Long-term follow up studies of Russian and other immigrants who are settling into concentrated and dispersed neighbourhoods could help untangle cause from effect, and differences obtained across sites and over time would also be informative for tailored community prevention and intervention strategies.

Given that our indirect effects failed to fully account for the relation between ED and symptoms, additional mediating mechanisms of ED may need to also be tested in order to obtain a clearer grasp of how ethnic density effects operate. Non-experimental studies may discover that ethnic and linguistic density leads to greater in-group pride and influence over negotiation of resources with the mainstream group, or ethnolinguistic vitality (Landry & Bourhis, 1997). Other potential mechanisms such as sense of familiarity, enhanced culture brokering (Jones & Trickett, 2005) or level of concordance between intersubjective and personal values (Chiu et al., 2012) could also be assessed. Naturalistic studies exploring ethnic density need to explore how this effect may influence social and cultural life beyond the local area, such as access to work

opportunities or links with same ethnic resources in other neighbourhoods. Qualitative methods used by anthropologists and some sociologists such as in-depth focus group interviews may further shed light on ethnic density mechanisms (see Whitley et al., 2006). Future studies examining mediators may also benefit from being informed by findings in cultural psychology (e.g., for a discussion of cultural-clinical adaptations for Russian-speakers, see Jurcik et al., 2013b).

Although perceived ethnic density effects are small (e.g., Kwag et al., 2012), particular individual differences may influence the effect of an ecology-acculturation match as was implied above. Various hypotheses were suggested throughout this discussion, including the importance of investigating individual differences in cognitive and emotional regulation that may further augment ecology-acculturation (mis)match effects. Future studies may explore such conjectures by incorporating personality inventories and measures assessing emotion regulation skills.

Experimental methods could be useful in examining whether cognitive resources are used more efficiently in small groups with a greater proportion of individuals from the same ethnolinguistic background who hold similar values (i.e., as a proxy for matched compared to non-matched neighbourhoods). Such experimental studies may simulate group problem-solving activities while manipulating the proportion of participants present in the groups based on ethnolinguistic backgrounds and personal value sets. Finally, advances in cultural neuroscience highlight the interwoven nature between cultural variables and the brain (Chiao et al., 2013), but may further benefit by taking account of participant psychosocial contexts outside of the MRI machine.

Diverse methods and interdisciplinary collaboration as the above could assist in bringing attention back to social ecology variables in contemporary psychological research (see Oishi et

al., 2009). We mentioned in the introduction that there has been a renewed interest in merging cultural psychology, clinical psychology as well as neuroscience in recent years (e.g., Ryder et al., 2011). While we agree that such a merger may lead to fruitful research programmes, it is our impression that such work has fundamentally been lacking an ecological component that would contextualize neural, mental health and cultural psychological phenomena. The current research has shown that variables such as acculturation and their relationship to depression or distress differ as a function of social ecology. Thus, clinical-cultural psychology could benefit from understanding how certain environmental contexts (such as social ecology) alter relationships between individual difference variables, including their neural correlates, and symptoms in various ethnocultural groups. The various future directions suggested here respect that social structures need to be integrated in social psychological and cultural-clinical research to facilitate practical solutions (see Oishi et al., 2009).

## **Conclusions**

In order not to fall into the trap of the fundamental attribution error (Ross, 1977), we attempted to integrate a social ecological framework to studying psychological acculturation, recognizing that there are extraneous variables on well-being and behaviour. Our research programme aimed to unpack the ethnic density effect and examine its moderating effect on psychological acculturation. In both study groups, utilizing first generation immigrant samples, a perceived ED effect was observed. The heterogeneous group had an indirect effect of ED through discrimination for depression, but for the Russian-speaking group an effect for general distress was found via problem-focused social support.

Additionally, ED played a role in altering the relation between heritage acculturation and adjustment in both groups. ED moderated the heritage acculturation-adjustment link with the

first group, which was further moderated by years lived in the neighbourhood in the second group. The interaction pattern suggested that a match between heritage acculturation and ethnic density (i.e., high on both) was related to decreased symptoms and a mismatch (e.g., high-low) with increased symptoms. An ecology-acculturation match highlights the importance of person-environment fit discussed in the community psychology literature (Angelique & Cully, 2007) and is in line with similar findings that have shown psychological benefits associated with a match between family and individual heritage acculturation (e.g., Asvat & Malcarne, 2008). It is possible that a fit operates via reduced value dissonance and related psychological and interpersonal stress, but this still needs to be unraveled in future research.

The findings with the Russian-speaking FSU group suggested that such a match may be more relevant at earlier points in time and less so for more established neighbourhood residents. An ED-heritage acculturation *match* (i.e., low-low) paradoxically appeared to be problematic for longstanding neighbourhood residents. The post-hoc findings imply that other mechanisms, such as cumulative risk (i.e., difficulty overcoming discrimination, renewing social networks, and cultural affiliation problems) may apply for some long-term residents in low ED neighbourhoods.

The current results contribute to explaining some of the inconsistencies in both acculturation and ethnic density empirical literatures. For instance, it has been demonstrated that heritage acculturation can be protective (see e.g., Asvat & Malcarne, 2008) as well as problematic for mental health (see Kennedy et al., 2005), whereas our findings suggest that ecological context may act as a moderator of acculturation. Similarly, the findings may shed light on why ethnic density is often protective, but can also be a risk factor for poor mental health outcomes (Shaw et al., 2012; Bécares et al., 2012): ED effects possibly depend on heritage

culture affiliation. The current findings will hopefully give cross-cultural and clinical psychology researchers the impetus to carefully incorporate ecological level variables, as community psychologists would, in studying acculturation-mental health links.

Future multi-site studies using mixed and longitudinal methodologies with both objective and subjective measures could further clarify the contextual and mediating mechanisms by combining other variables from an ecology framework (Stokols, 1992). Contextualized multilevel designs create a greater level of complexity but concomitantly may succeed in resolving paradoxical and inconsistent findings in acculturation and other social research (e.g., Trickett et al., 2009). These might further corroborate prevention and clinical intervention implications which the current studies are already leaning towards, such as combining perceived ED and bidimensional acculturation measurement in clinical assessment with immigrants. More generally, it is our hope that the current programme might further inspire renewed interest in ecology related phenomena within (cross-) cultural and clinical psychology research, as well as the neurosciences. The various future directions suggested here are in the spirit of understanding social structures in order to better comprehend psychological ones (see Oishi et al., 2009).

By omitting social ecological phenomena from acculturation psychology, researchers until recently may have inadvertently been committing the fundamental attribution error (Ross, 1977). In other words, they have insufficiently addressed the influence of external factors on the acculturation “strategies” that immigrants utilize, and in turn, how these styles might interact with social ecology in predicting adjustment. The approach to studying acculturation in a decontextualized manner (Trickett et al., 2009) may have partly been driven by a Western epistemological framework (perhaps more prevalent in psychology departments), which overemphasizes the agency of the individual while ignoring background influences (see Miller,

1984). Essentially this dialectic tension between the individual and context, where the focus is placed on the individual, is analogous to a type of figure-ground illusion where one's attention is on the figure (see also Allport, 1948). However, just as the figure needs the background for this perceptual illusion to work, the background also requires the figure. Thus, epidemiological research attempts at assessing phenomena such as ethnic density will also likely be more fruitful by including psychological variables. Ultimately, a rapprochement and close interdisciplinary collaboration between community psychologists, cultural psychologists as well as anthropologists, neuroscientists, and social psychiatry researchers may help "solve" some of the "personal troubles" faced in our society (see Oishi et al., 2009, p. 336), by closely balancing figure and ground and recognizing their interdependence.

## Tables

Study 1

Table 1

*Demographic variables for First Generation University Student Immigrants to Canada (N=146)*

Variables	
Gender (% female)	85.6
Age (years): Mean (SD)	26.01 (7.53)
Canada (years): Mean (SD)	11.50 (7.31)
Quebec (years)*: Mean (SD)	9.54 (7.13)
Region of birth (%)	
Europe	29.5
Middle East and North Africa	25.3
East and Southeast Asia	15.8
Latin America	15.1
South Asia	8.2
Caribbean	4.1
Africa (sub-Saharan)	2.1
Perceived Ethnic Density** (%)	
None or hardly none	37.1
Some	50.3
About Half	7.7
More than half	4.2
All or almost all	0.7

*Note.* SD = standard deviation.

\*78.1% lived longer in Quebec than the rest of Canada; U.S. immigrants and those with Canadian parents were excluded. \*\*N=143

Table 2

*Correlation Matrix for Ethnic Density, Discrimination, Social Support, Acculturation, and Depression*

	ED	PERDS	CES-D	MSPSS	QVIA-H	QVIA-F
ED	-----	-.19* 139	-.17* 138	-.03 136	.00 137	.06 137
PERDS		-----	.38**140	-.23**138	-.10 139	-.15 139
CES-D			-----	-.29**138	-.10 138	-.15 138
MSPSS				-----	.19* 137	.15 137
QVIA-H					-----	.11 139
QVIA-F						-----

*Note.* ED = perceived ethnic density; PERDS = Perceived Discrimination Scale; CES-D = Centre for Epidemiologic Studies-Depression; MSPSS = Multidimensional Scale of Perceived Social Support; VIA-H = Vancouver Index of Acculturation – Heritage; VIA-F = Vancouver Index of Acculturation – French-Canadian Mainstream. Pairwise *N*s are provided in subscript. \* $p \leq .05$ , \*\* $p < .01$

Table 3

*Hierarchical Multiple Regression of Depression (CES-D) on Ethnic Density, Discrimination, Social Support, Acculturation, and Ethnic Density Interactions*

Variables	Step 1				Step 2			
	$\beta$	<i>sr</i>	<i>t</i>	<i>p</i>	$\beta$	<i>sr</i>	<i>t</i>	<i>p</i>
Main effects (Block 1)								
†Ethnic density (ED)	-.08	-.07	-0.93	.36	-.07	-.07	-0.89	.38
Heritage Acculturation (VIA-H)	-.03	-.03	-0.37	.71	.20	.12	1.53	.13
French-Can. Acculturation (VIA-F)	-.07	-.07	-0.86	.39	-.11	-.06	-0.78	.44
Social Support (MSPSS)	-.20	-.19	-2.39	.02	-.24	-.17	-2.10	.04
Perceived Discrimination (PERDS)	.29	.28	3.49	.00	.19	.13	1.58	.12
Ethnic density Interactions (Block 2)								
†ED × VIA-H					-.30	-.18	-2.25	.03
†ED × VIA-F					.07	.04	0.49	.62
†ED × MSPSS					.08	.05	0.67	.50
†ED × PERDS					.12	.08	0.95	.34
<i>R</i> <sup>2</sup>	.19***				.23***			
<i>R</i> <sup>2</sup> Change					.04			

*Note.* ED = perceived ethnic density; PERDS = Perceived Discrimination Scale; CES-D = Centre for Epidemiologic Studies-Depression; MSPSS = Multidimensional Scale of Perceived Social Support; VIA-H = Vancouver Index of Acculturation – Heritage; VIA-F = Vancouver Index of Acculturation – French-Canadian Mainstream. Standardized beta and semi-partial correlations (*sr*) are reported.

†In order to preserve group size in the regression, ethnic density was dichotomized into high (some or more  $N=85$ ) and low (none or hardly any  $N= 50$ ) groups. The  $n$  listed here are slightly less than in the text due to the listwise selection in the regression. Age, gender, and household income did not correlate with depression and were therefore not entered in step 0 (block 0).

\*\*\* $p<.001$ . Italicized  $p$  values in the table indicate significance ( $p<.05$ ).

## Study 2

Table 1

*Demographic variables for immigrants from Former Soviet Union to Montreal, Canada (N=269)*

Variables	
Gender (% female)	68.0
Age (years): Mean (SD)	34.16 (7.71)
Canada (years): Mean (SD)	5.05 (5.24)
Quebec (years): Mean (SD)	4.81 (5.17)
Country of birth (%)	
Russia	34.7
Ukraine	25.4
Moldova	15.3
Belarus	9.0
Kazakhstan	5.6
Other Former Soviet Union	10.0
Language of survey (%)	
Russian language survey	77.0
English language survey	23.0
Referrals (%)	
Russian Forum	40.4
Online Advertisement	39.2
School	12.7
Other (friend, family, newspaper, etc.)	7.7

*Note.* Immigrants born outside of the FSU were excluded.

Table 2

*Correlation Matrix for Ethnic Density, Discrimination, Depression, Distress, Social Support, and Acculturation*

	ED	PERDS	CES-D	GHQ	F-COPES AcSS	REFR	SPIRIT	MFAM	PASA	MSPSS	VIA-H	VIA-M
ED	-----	.08	-.09	-.15*	.15*	-.01	.17**	.16**	-.03	.07	.09	.10
PERDS		-----	.25**	.08	.02	-.02	.12	.01	-.16**	-.06	.07	.06
CES-D			-----	.62**	-.19**	-.31**	-.02	-.17**	-.24**	-.40**	-.09	-.07
GHQ				-----	-.24**	-.37**	-.18**	-.16**	-.09	-.40**	-.08	-.14*
F-COPES AcSS					-----	.28**	.62**	.66**	-.40**	.35**	.13*	.19**
REFR						-----	.29**	.16**	-.19**	.29**	.17**	.21**
SPIRIT							-----	.50**	-.37**	.29**	.18**	.18**
MFAM								-----	-.28**	.27**	.01	.28**
PASA									-----	.05	-.15*	-.16*
MSPSS										-----	.16**	.13*
VIA-H											-----	.17**
VIA-M												-----

*Note.* ED = Perceived Ethnic Density, PERDS = Perceived Discrimination, CES-D = Depression, GHQ = Distress, F-COPES = Family-Oriented Personal Evaluation Scale, AcSS = Acquiring Social Support, REFR = Reframing, SPIRIT = Seeking Spiritual Support, MFAM = Mobilizing Family to Acquire and Accept Help, PASA = Passive Appraisal, MSPSS = Social Support, VIA-H = Heritage Acculturation, VIA-M = Mainstream Acculturation (French or English).  $N=262$ . \* $p < .05$ , \*\* $p \leq .01$ .

Table 3

*Hierarchical Multiple Regression of Distress (GHQ-12) on Ethnic Density, Acculturation, Years Lived in Neighbourhood, and Interactions*

Variables	$\beta$	Final Step		
		<i>sr</i>	<i>t</i>	<i>p</i>
Main effects (Block 1)				
†Ethnic density (ED)	-.02	-.01	-.22	.83
†Time in Neighbourhood	.06	.04	.62	.54
Heritage Acculturation (VIA-H)	.09	.05	.83	.41
Ethnic Density Interactions (Block 2)				
†ED x VIA-H	-.22	-.11	-1.84	.07
†ED x Time (Neighbourhood)	-.20	-.12	-1.93	.06
†VIA-H x Time (Neighbourhood)	-.22	-.11	-1.84	.07
Time in Neighbourhood Interactions (Block 3)				
†ED x VIA-H x Time (Neighbourhood)	.28	.13	2.21	.03
<i>R</i> <sup>2</sup>	.06			
<i>R</i> <sup>2</sup> Change	.02			

*Note.* Standardized beta ( $\beta$ ) and semi-partial correlations (*sr*) are reported for the final step.

*N*=265. Age, gender, and household income did not correlate with distress and were therefore not entered in step 0 (block 0). Italics indicate  $p < .05$ .

†In order to preserve group size in the regression, ethnic density was dichotomized into low ( $n=128$ ) or high groups ( $n=137$ ); time resided in the neighbourhood was also dichotomized into low (less than 2 years,  $n=145$ ) or high (more than 2 years,  $n=120$ ).

Table 4

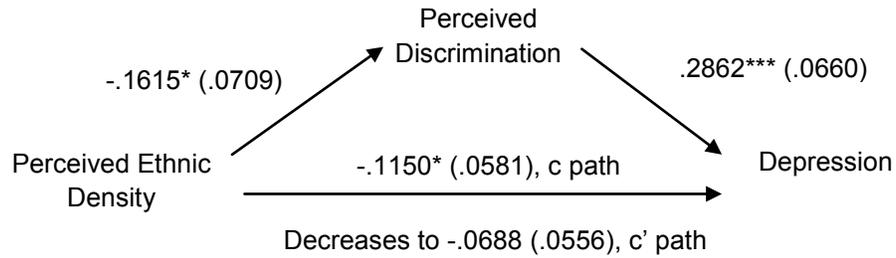
*Differences in Distress (GHQ-12), Depression (CES-D), General Social Support (MSPSS), and Discrimination (PERDS) by Low and High Ethnic Density Groups that are Recent or More Established in their Neighbourhood*

	Recent				Established				ANOVA			
	Low ED		High ED		Low ED		High ED		<i>df</i>	<i>F</i>	$\eta^2$	<i>p</i>
GHQ	1.23 <sub>ab</sub>	(0.45)	1.22 <sub>ab</sub>	(0.45)	1.29 <sub>a</sub>	(0.48)	1.06 <sub>b</sub>	(0.41)	(3, 262)	2.97	0.03	.032
CESD	0.71 <sub>ab</sub>	(0.58)	0.81 <sub>a</sub>	(0.53)	0.93 <sub>a</sub>	(0.57)	0.54 <sub>b</sub>	(0.42)	(3, 261)	5.94	0.06	.001
MSPSS	5.95 <sub>a</sub>	(0.96)	5.69 <sub>ab</sub>	(1.24)	5.40 <sub>b</sub>	(1.35)	5.88 <sub>ab</sub>	(1.04)	(3, 261)	2.80	0.03	.040
PERDS	1.41 <sub>a</sub>	(0.51)	1.73 <sub>b</sub>	(0.73)	1.86 <sub>b</sub>	(0.76)	1.65 <sub>ab</sub>	(0.63)	(3, 261)	5.49	0.06	.001

*Note.* Standard deviations appear in parentheses. Means sharing the same subscript letter do not differ significantly. Recent residents have lived in their neighbourhood for less than two years, and established residents for more than two years.

## Figures

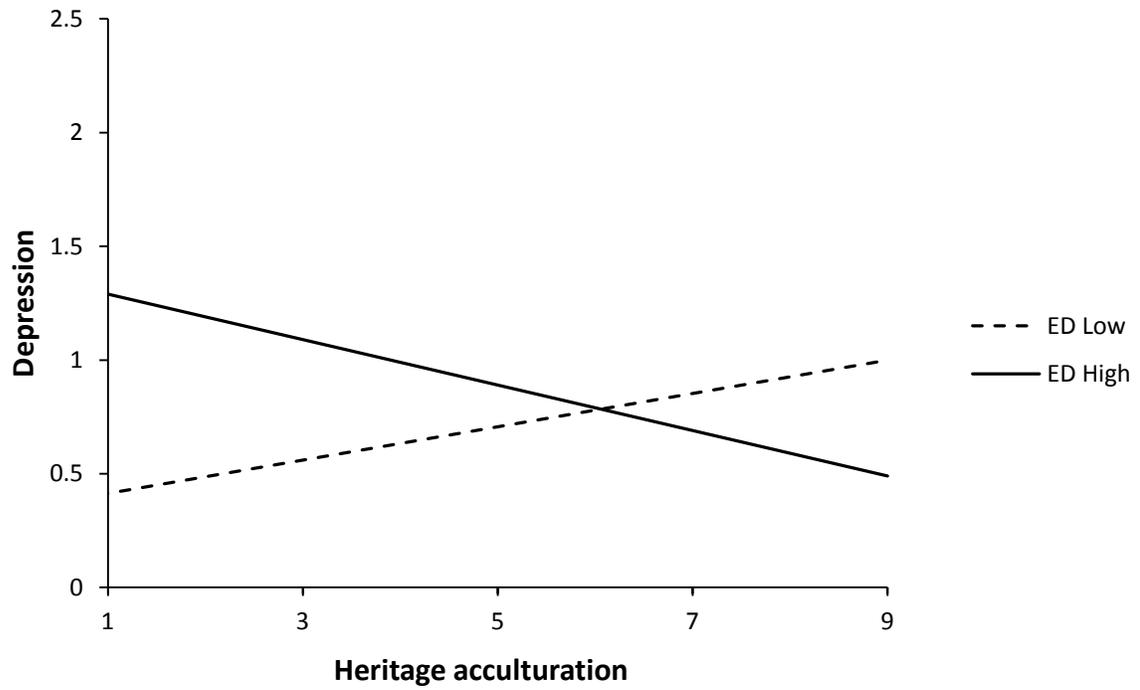
## Study 1



*Figure 1.* The relation between perceived ethnic density and depression (CES-D) mediated by perceived discrimination (PERDS).

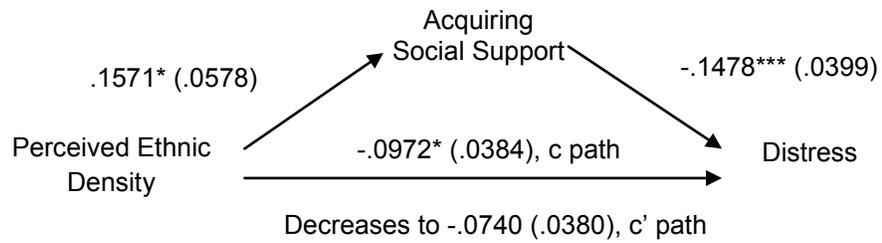
*Note.* Indirect effect =  $-.0462$ ,  $SE = .0263$ , Percentile corrected 95% CI ( $-.1051$  to  $-.0016$ ) did not include (but were close to) zero. A bootstrap test with 5000 resamples was used (Preacher & Hayes, 2008).  $N = 138$ .

\* $p < .05$ , \*\*\* $p < .001$ .



*Figure 2.* Interaction effect between ethnic density (ED) and heritage acculturation (VIA-H) for depression (CES-D) without accounting for the effects of other variables.

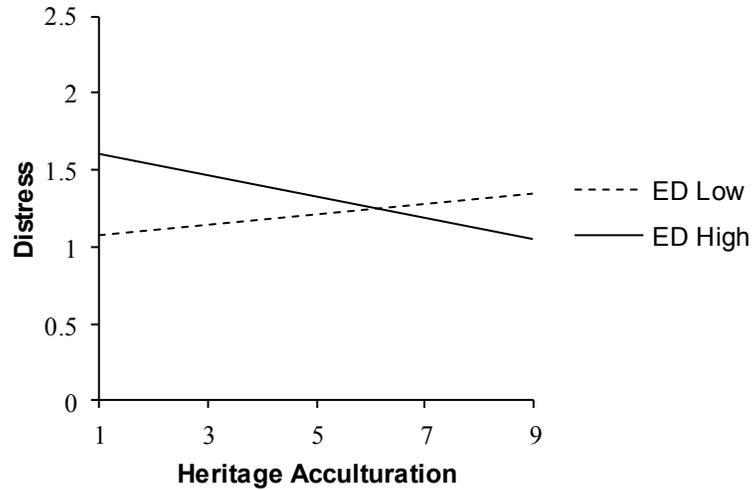
## Study 2



*Figure 1.* The perceived ethnic density and distress (GHQ-12) relation mediated by acquiring social support (F-COPES AcSS), using bootstrapping analysis.

*Note.* Indirect effect =  $-.0232$ ,  $SE = .0103$ , Percentile corrected 95% CI ( $-.0457$  to  $-.0056$ ) did not include zero. A bootstrap test with 5000 resamples was used (Hayes, 2012).  $N = 266$ . \* $p < .05$ , \*\*\* $p < .001$ .

Less than 2 years of neighbourhood residence



More than 2 years of neighbourhood residence

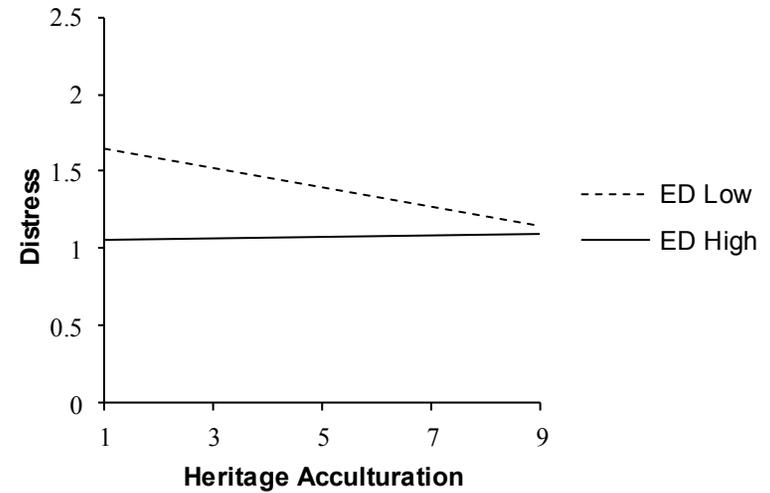


Figure 2. Interaction between perceived ethnic density (ED), heritage acculturation (VIA-H), and length of neighbourhood residence for psychological distress (GHQ-12).

Note. Mean item scores for distress and heritage acculturation are presented without accounting for other variables in the model. The pattern for recent neighbourhood residents (less than two years in the neighbourhood) appears in the left panel and established residents (more than two years in the neighbourhood) in the right panel.

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## Appendix A

### Self-report measures (English)

## Vancouver Index of Acculturation (VIA; Ryder et al., 2000)

Please answer the following questions, using the scale provided:

**1 = Strongly disagree**

**3 = Disagree**

**5 = Neutral/Depends**

**7 = Agree**

**9 = Strongly agree**

1. I often participate in my heritage culture traditions	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
2. I often participate in mainstream English-Canadian traditions	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
3. I often participate in mainstream French-Canadian traditions	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
4. I would be willing to marry a person from my heritage culture	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
5. I would be willing to marry an English-Canadian person	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
6. I would be willing to marry a French Canadian person	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
7. I enjoy social activities with people from the same heritage culture as myself	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
8. I enjoy social activities with typical English-Canadian people	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
9. I enjoy social activities with typical French-Canadian people	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
10. I am comfortable working with people of the same heritage culture as myself	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
11. I am comfortable working with typical English-Canadian people	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
12. I am comfortable working with typical French-Canadian people	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
13. I enjoy entertainment (e.g., movies, music) from my heritage culture	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
14. I enjoy English-Canadian entertainments (e.g., movies, music)	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
15. I enjoy French-Canadian entertainments (e.g., movies, music)	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

16. I often behave in ways that are typical of my heritage culture	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
17. I often behave in ways that are ‘typically English-Canadian’	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
18. I often behave in ways that are ‘typically’ French Canadian	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
19. It is important to me to maintain or develop the practices of my heritage culture	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
20. It is important for me to maintain or develop English-Canadian cultural practices	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
21. It is important for me to maintain or develop French-Canadian cultural practices	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
22. I believe in the values of my heritage culture	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
23. I believe in mainstream English-Canadian values	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
24. I believe in mainstream French-Canadian values	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
25. I enjoy the jokes and humor of my heritage culture	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
26. I enjoy typical English-Canadian jokes and humor	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
27. I enjoy typical French-Canadian jokes and humor	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
28. I am interested in having friends from my heritage culture	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
29. I am interested in having English-Canadian friends	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
30. I am interested in having French-Canadian friends	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

## Center for Epidemiologic Studies - Depression (CES-D; Radloff, 1977)

Please answer the following questions, using the scale provided:

**0 = Rarely or none of the time (less than one day)**

**1 = Some or a little of the time (1-2 days)**

**2 = Occasionally or a moderate amount of time (3-4 days)**

**3 = Most or all of the time (5-7 days)**

1. I was bothered by things that usually don't bother me.	0 – 1 – 2 – 3
2. I did not feel like eating; My appetite was poor.	0 – 1 – 2 – 3
3. I felt that I could not shake off the blues even with help from my family and friends.	0 – 1 – 2 – 3
4. I felt that I was just as good as other people.	0 – 1 – 2 – 3
5. I had trouble keeping my mind on what I was doing.	0 – 1 – 2 – 3
6. I felt depressed.	0 – 1 – 2 – 3
7. I felt everything I did was an effort.	0 – 1 – 2 – 3
8. I felt hopeful about the future.	0 – 1 – 2 – 3
9. I thought my life had been a failure.	0 – 1 – 2 – 3
10. I felt fearful.	0 – 1 – 2 – 3
11. My sleep was restless.	0 – 1 – 2 – 3
12. I was happy.	0 – 1 – 2 – 3
13. I talked less than usual.	0 – 1 – 2 – 3
14. I felt lonely.	0 – 1 – 2 – 3
15. People were unfriendly.	0 – 1 – 2 – 3

16. I enjoyed life. 0 – 1 – 2 – 3

17. I had crying spells. 0 – 1 – 2 – 3

18. I felt sad. 0 – 1 – 2 – 3

19. I could not “get going”. 0 – 1 – 2 – 3

20. I felt people disliked me. 0 – 1 – 2 – 3

**Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1998)**

Please answer the following questions, using the scale provided:

**1 = Very strongly agree**

**2 = Strongly agree**

**3 = Mildly agree**

**4 = Neutral**

**5 = Mildly agree**

**6 = Strongly agree**

**7 = Very strongly agree**

1. There is a special person who is around when I am in need.	1 – 2 – 3 – 4 – 5 – 6 – 7
2. There is a special person with whom I can share my joys and sorrows.	1 – 2 – 3 – 4 – 5 – 6 – 7
3. My family really tries to help me.	1 – 2 – 3 – 4 – 5 – 6 – 7
4. I get the emotional help and support I need from my family.	1 – 2 – 3 – 4 – 5 – 6 – 7
5. I have a special person who is a real source of comfort to me.	1 – 2 – 3 – 4 – 5 – 6 – 7
6. My friends really try to help me.	1 – 2 – 3 – 4 – 5 – 6 – 7
7. I can count on my friends when things go wrong.	1 – 2 – 3 – 4 – 5 – 6 – 7
8. I can talk about my problems with my family.	1 – 2 – 3 – 4 – 5 – 6 – 7
9. I have friends with whom I can share my joys and sorrows.	1 – 2 – 3 – 4 – 5 – 6 – 7
10. There is a special person in my life who cares about my feelings.	1 – 2 – 3 – 4 – 5 – 6 – 7
11. My family is willing to help me make decisions.	1 – 2 – 3 – 4 – 5 – 6 – 7
12. I can talk about my problems with my friends.	1 – 2 – 3 – 4 – 5 – 6 – 7

### Perceived Discrimination Scale (PERDS; Noh & Kaspar, 2003)

Please answer the following questions, using the scale provided:

**1 = Never**

**2 = Once**

**3 = A few times**

**4 = Many times**

**5 = All the time**

#### In Canada, because of discrimination...

- |  |                   |
|--|-------------------|
| 1. Have you ever been hit or handled roughly?  | 1 – 2 – 3 – 4 – 5 |
| 2. Have you ever been insulted or called names?  | 1 – 2 – 3 – 4 – 5 |
| 3. Has anyone ever been rude to you?   | 1 – 2 – 3 – 4 – 5 |
| 4. Have you ever been treated unfairly?  | 1 – 2 – 3 – 4 – 5 |
| 5. Have you ever been threatened?  | 1 – 2 – 3 – 4 – 5 |
| 6. Have you ever been refused service (e.g., in a store or restaurant) or had service delayed? | 1 – 2 – 3 – 4 – 5 |
| 7. Have you ever been excluded or ignored?   | 1 – 2 – 3 – 4 – 5 |
| 8. Has anyone in your family ever been discriminated against in any way?                       | 1 – 2 – 3 – 4 – 5 |

## Family Crisis Oriented Personal Scales (F-COPES; McCubbin, Olsen & Larsen, 1996)

Please answer the following questions, using the scale provided:

**1 = Strongly disagree**

**2 = Moderately disagree**

**3 = Neither agree nor disagree**

**4 = Moderately agree**

**5 = Strongly agree**

**When we face problems or difficulties in our family, we respond by:**

1. Sharing our difficulties with relatives.	1 – 2 – 3 – 4 – 5
2. Seeking support and encouragement from friends.	1 – 2 – 3 – 4 – 5
3. Knowing we have the power to solve major problems.	1 – 2 – 3 – 4 – 5
4. Seeking information and advice from persons in other families who have faced the same or similar problems.	1 – 2 – 3 – 4 – 5
5. Seeking advice from relatives ( grandparents etc).	1 – 2 – 3 – 4 – 5
6. Seeking assistance from community agencies and programs designed to help families in our situation.	1 – 2 – 3 – 4 – 5
7. Knowing that we have the strength within our family to solve our problems.	1 – 2 – 3 – 4 – 5
8. Receiving gifts and favours from neighbours ( e.g. food, taking the mail etc).	1 – 2 – 3 – 4 – 5
9. Seeking information and advice from family doctor.	1 – 2 – 3 – 4 – 5
10. Asking neighbours for favours and assistance.	1 – 2 – 3 – 4 – 5
11. Facing the problems “head-on” and trying to get solutions right away.	1 – 2 – 3 – 4 – 5
12. Watching television.	1 – 2 – 3 – 4 – 5
13. Showing that we are strong.	1 – 2 – 3 – 4 – 5

14. Attending religious/spiritual services.	1 – 2 – 3 – 4 – 5
15. Accepting stressful events as fact of life.	1 – 2 – 3 – 4 – 5
16. Sharing concerns with close friends.	1 – 2 – 3 – 4 – 5
17. Knowing luck plays a big part in how well we are able to solve family problems.	1 – 2 – 3 – 4 – 5
18. Exercising with friends to stay fit and reduce tension.	1 – 2 – 3 – 4 – 5
19. Accepting that difficulties occur unexpectedly.	1 – 2 – 3 – 4 – 5
20. Doing things with relatives (get-togethers, dinners, etc).	1 – 2 – 3 – 4 – 5
21. Seeking professional counseling and help for family difficulties.	1 – 2 – 3 – 4 – 5
22. Believing we can handle our own problems.	1 – 2 – 3 – 4 – 5
23. Participating in religious/spiritual activities.	1 – 2 – 3 – 4 – 5
24. Defining the family problem in a more positive way so that we do not become too discouraged.	1 – 2 – 3 – 4 – 5
25. Asking relatives how they feel about problems we face.	1 – 2 – 3 – 4 – 5
26. Feeling that no matter what we do to prepare, we will have difficulty handling problems.	1 – 2 – 3 – 4 – 5
27. Seeking advice from a religious/spiritual guide/figure.	1 – 2 – 3 – 4 – 5
28. Believing if we wait long enough, the problem will go away.	1 – 2 – 3 – 4 – 5
29. Sharing problems with neighbours.	1 – 2 – 3 – 4 – 5
30. Having faith in God.	1 – 2 – 3 – 4 – 5

## General Health Questionnaire (GHQ-12; Goldberg, 1992)

Please answer the following questions, using the scale provided:

**0 = Not at all**

**1 = Not much more than usual**

**2 = Rather more than usual**

**3 = Much more than usual**

**In the last two weeks, have you...**

- |   |               |
|---|---------------|
| 1. Been able to concentrate on what you're doing?         | 0 – 1 – 2 – 3 |
| 2. Lost much sleep over worry?                            | 0 – 1 – 2 – 3 |
| 3. Felt you were playing a useful part in things?         | 0 – 1 – 2 – 3 |
| 4. Felt capable of making decisions about things?         | 0 – 1 – 2 – 3 |
| 5. Felt constantly under strain?                          | 0 – 1 – 2 – 3 |
| 6. Felt you couldn't overcome your difficulties?          | 0 – 1 – 2 – 3 |
| 7. Been able to enjoy your normal day-to-day activities?  | 0 – 1 – 2 – 3 |
| 8. Been able to face up to your problems?                 | 0 – 1 – 2 – 3 |
| 9. Been feeling unhappy and depressed?                    | 0 – 1 – 2 – 3 |
| 10. Been losing confidence in yourself?                   | 0 – 1 – 2 – 3 |
| 11. Been thinking of yourself as a worthless person?      | 0 – 1 – 2 – 3 |
| 12. Been feeling reasonably happy, all things considered? | 0 – 1 – 2 – 3 |

### Perceived Ethnic Density - Composite (ED; extension of Stafford et al., 2009)

1. Now thinking about people in your local area (15/20 minutes' walking distance of your house/apartment), what proportion of all the people in this local area are of the same ethnic group as you?

None or hardly any	0
Less than half of the local area	1
About half of the local area	2
More than half of the local area	3
Almost all or all of the local area	4

2. Please indicate to what extent you can access specialty products related to your ethnic group in your local area, within 15-20 minutes walking distance of your home (e.g., Russian food products in your area if you are Russian).

Not at all	0
To only a limited extent	1
To some extent	2
To a moderate extent	3
To a large extent	4

3. Please indicate to what extent you could get by in your native language in your local area, within 15-20 minutes' walking distance of your home (e.g., you would be understood if speaking to neighbours and local shopkeepers in Vietnamese if you are from Vietnam).

Not at all	0
To only a limited extent	1
To some extent	2
To a moderate extent	3
To a large extent	4

4. Please indicate to what extent you have access to resources and organizations that cater to your ethnic group in your local area, within 15-20 minutes' walking distance of your home (e.g., a Chinese community center in your area if you are Chinese).

Not at all	0
To only a limited extent	1
To some extent	2
To a moderate extent	3
To a large extent	4

## Appendix B

### Self-report measures (Russian)

## Vancouver Index of Acculturation (VIA; translated adaption from Ryder et al., 2000)

Ответьте на каждый из вопросов как можно точнее, указывая, на сколько вы согласны или не согласны с утверждением.

Используйте следующую шкалу для ответа:

**1 = Совершенно не согласен**

**3 = Не согласен**

**5 = Неопределенно**

**7 = Согласен**

**9 = Полностью согласен**

1. Я часто принимаю участие в традициях моей родной культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
2. Я часто принимаю участие в традициях местной англо-канадской культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
3. Я часто принимаю участие в традициях местной франко-канадской культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
4. Я хотел бы жениться на человеке, представляющем мою родную культуру / Я хотела бы выйти замуж за человека, представляющего мою родную культуру	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
5. Я хотел бы жениться на человеке, представляющем англо-канадскую культуру./ Я хотела бы выйти замуж за человека, представляющего англо-канадскую культуру.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
6. Я хотел бы жениться на человеке, представляющем франко-канадскую культуру./ Я хотела бы выйти замуж за человека, представляющего франко-канадскую культуру.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
7. Мне нравятся общественные мероприятия с людьми, представляющими мою родную культуру.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
8. Мне нравятся общественные мероприятия с людьми, представляющими англо-канадскую культуру.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
9. Мне нравятся общественные мероприятия с людьми, представляющими франко-канадскую культуру.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
10. Мне комфортно работать с людьми, представляющими ту же культуру, что и я.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

11. Мне комфортно работать с типичными англо-канадцами.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
12. Мне комфортно работать с типичными франко-канадцами.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
13. Мне нравятся развлечения (кино, музыка и т.п.) моей родной культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
14. Мне нравятся англо-канадские развлечения (кино, музыка и т.п.).	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
15. Мне нравятся франко-канадские развлечения (кино, музыка и т.п.).	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
16. Я часто веду себя так, как свойственно человеку моей родной культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
17. Я часто веду себя, как типичный англо-канадец.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
18. Я часто веду себя, как типичный франко-канадец.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
19. Для меня важно поддерживать или развивать обычаи моей родной культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
20. Для меня важно поддерживать или развивать обычаи англо-канадской культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
21. Для меня важно поддерживать или развивать обычаи франко-канадской культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
22. Я верю в ценности моей родной культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
23. Я верю в ценности местной англо-канадской культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
24. Я верю в ценности местной франко-канадской культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
25. Мне нравятся шутки и юмор моей родной культуры.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
26. Мне нравятся шутки и юмор англо-канадцев.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
27. Мне нравятся шутки и юмор франко-канадцев	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9
28. Мне бы хотелось иметь друзей, представляющих мою родную культуру.	1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

29. Мне бы хотелось дружить с англо-канадцами.

1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

30. Мне бы хотелось дружить с франко-канадцами.

1 – 2 – 3 – 4 – 5 – 6 – 7 – 8 – 9

## Center for Epidemiologic Studies - Depression (translation of CES-D; Radloff, 1977)

Утверждения, приведенные ниже, описывают возможные варианты вашего поведения или настроения. Укажите, как часто вы чувствовали себя подобным образом на протяжении прошедшей недели.

**0 = Редко или никогда (меньше чем 1 день)**

**1 = Редко (1-2 дня)**

**2 = Иногда или умеренное количество времени (3-4 дня)**

**3 = Большую часть времени (5-7 дней)**

1. Я переживал из-за вещей, которые меня обычно не беспокоят.	0 – 1 – 2 – 3
2. Мне не хотелось есть, у меня был плохой аппетит.	0 – 1 – 2 – 3
3. Я чувствовал, что не могу избавиться от грусти, даже с помощью моей семьи и друзей	0 – 1 – 2 – 3
4. Я чувствовал, что я не хуже других.	0 – 1 – 2 – 3
5. Мне было трудно сосредоточиться на том, что я делал.	0 – 1 – 2 – 3
6. Я чувствовал себя подавленным.	0 – 1 – 2 – 3
7. Я чувствовал, что все, что я делал, было мне в тягость.	0 – 1 – 2 – 3
8. Я был полон надежд о будущем.	0 – 1 – 2 – 3
9. Я чувствовал, что моя жизнь не удалась.	0 – 1 – 2 – 3
10. Я чувствовал страх.	0 – 1 – 2 – 3
11. Мой сон был беспокойным.	0 – 1 – 2 – 3
12. Я чувствовал радость.	0 – 1 – 2 – 3
13. Я говорил больше, чем обычно.	0 – 1 – 2 – 3
14. Я чувствовал себя одиноко.	0 – 1 – 2 – 3

15. Люди были недружелюбны ко мне. 0 – 1 – 2 – 3

16. Я наслаждался жизнью. 0 – 1 – 2 – 3

17. У меня были приступы рыданий. 0 – 1 – 2 – 3

18. Я чувствовал грусть. 0 – 1 – 2 – 3

19. Я не мог заставить себя чем-то заняться. 0 – 1 – 2 – 3

20. Мне казалось, что люди недолюбливают меня. 0 – 1 – 2 – 3

**Multidimensional Scale of Perceived Social Support (MSPSS; translation of Zimet, Dahlem, Zimet, & Farley, 1988)**

Используйте следующую шкалу для ответов:

**1 – Категорически не согласен**

**2 – Не согласен**

**3 – Немного не согласен**

**4 – Неопределенно**

**5 – Немного согласен**

**6 – Согласен**

**7 – Полностью согласен**

1. У меня есть близкий человек, который может помочь мне, когда я нуждаюсь в помощи.	1 – 2 – 3 – 4 – 5 – 6 – 7
2. У меня есть близкий человек, с которым я могу разделить свои проблемы и радости.	1 – 2 – 3 – 4 – 5 – 6 – 7
3. Моя семья на самом деле старается помогать мне.	1 – 2 – 3 – 4 – 5 – 6 – 7
4. Я получаю эмоциональную помощь и поддержку от моей семьи.	1 – 2 – 3 – 4 – 5 – 6 – 7
5. У меня есть близкий человек, который является настоящим источником поддержки и ободрения для меня.	1 – 2 – 3 – 4 – 5 – 6 – 7
6. Мои друзья на самом деле стараются помогать мне.	1 – 2 – 3 – 4 – 5 – 6 – 7
7. Когда все идет не так, я могу рассчитывать на своих друзей.	1 – 2 – 3 – 4 – 5 – 6 – 7
8. Я могу обсудить свои проблемы со своей семьей.	1 – 2 – 3 – 4 – 5 – 6 – 7
9. У меня есть друзья, с которыми я могу поделиться и радостью, и горем.	1 – 2 – 3 – 4 – 5 – 6 – 7
10. У меня есть близкий человек, которого заботят мои чувства.	1 – 2 – 3 – 4 – 5 – 6 – 7
11. Моя семья готова помочь мне в принятии решений.	1 – 2 – 3 – 4 – 5 – 6 – 7
12. Я могу обсудить свои проблемы с друзьями.	1 – 2 – 3 – 4 – 5 – 6 – 7

## Perceived Discrimination Scale (PERDS; translation of Noh & Kaspar, 2003)

Используйте следующую шкалу для ответов:

**1 = никогда**

**2 = один раз**

**3 = несколько раз**

**4 = много раз**

**5 = постоянно**

### В Канаде из-за дискриминации...

1. Вас когда-либо ударяли или обращались с вами жестко?	1 – 2 – 3 – 4 – 5
2. Вас когда-либо оскорбляли или обзывали?	1 – 2 – 3 – 4 – 5
3. С вами кто-то был груб?	1 – 2 – 3 – 4 – 5
4. С вами когда-либо обращались несправедливо?	1 – 2 – 3 – 4 – 5
5. Вам когда-либо угрожали?	1 – 2 – 3 – 4 – 5
6. Вас когда-либо не обслужили (в магазине, ресторане и т.п.) или обслужили невовремя?	1 – 2 – 3 – 4 – 5
7. Вас когда-либо исключили (из компании и т.п.) или проигнорировали?	1 – 2 – 3 – 4 – 5
8. Кто-то из вашей семьи когда-либо испытывал дискриминацию в любом виде?	1 – 2 – 3 – 4 – 5

## Family Crisis Oriented Personal Scales (F-COPES; translation of McCubbin, Olsen & Larsen, 1996)

Используйте следующую шкалу для ответа:

**1 = Полностью не согласен**

**2 = Не согласен**

**3 = Неопределенно**

**4 = Согласен**

**5 = Полностью согласен.**

**Когда наша семья сталкивается с проблемами и трудностям, мы...**

1. Делимся нашими проблемами с родственниками.	1 – 2 – 3 – 4 – 5
2. Ищем поддержки и ободрения у друзей.	1 – 2 – 3 – 4 – 5
3. Знаем, что мы в силах решить тяжелые проблемы.	1 – 2 – 3 – 4 – 5
4. Просим совета и информации у людей из других семей, которым пришлось решать такие же или похожие проблемы.	1 – 2 – 3 – 4 – 5
5. Просим совета у родственников (бабушек, дедушек и т.п.)	1 – 2 – 3 – 4 – 5
6. Обращаемся в общественные центры и пользуемся социальными программами, разработанными для помощи семьям в нашей ситуации.	1 – 2 – 3 – 4 – 5
7. Знаем, что мы в состоянии решить свои проблемы внутри нашей семьи.	1 – 2 – 3 – 4 – 5
8. Принимаем подарки или помощь от соседей (принимаем еду, просим соседей помочь нам сделать покупки и т.д.)	1 – 2 – 3 – 4 – 5
9. Обращаемся за советом и информацией к семейному врачу	1 – 2 – 3 – 4 – 5
10. Просим соседей об услугах и помощи.	1 – 2 – 3 – 4 – 5
11. Открыто противостояем проблемам и пытаемся сразу же найти им решение.	1 – 2 – 3 – 4 – 5
12. Смотрим телевизор.	1 – 2 – 3 – 4 – 5
13. Показываем, что мы сильные.	1 – 2 – 3 – 4 – 5

14. Посещаем религиозные/духовные собрания.	1 – 2 – 3 – 4 – 5
15. Воспринимаем трудные ситуации, как неотменный атрибут жизни.	1 – 2 – 3 – 4 – 5
16. Делимся переживаниями с близкими друзьями.	1 – 2 – 3 – 4 – 5
17. Знаем, что в решении семейных проблем значительную роль играет удача.	1 – 2 – 3 – 4 – 5
18. Занимаемся с друзьями спортом, чтобы оставаться здоровыми и снять напряжение.	1 – 2 – 3 – 4 – 5
19. Принимаем тот факт, что проблемы приходят, когда их совсем не ждешь.	1 – 2 – 3 – 4 – 5
20. Проводим время с родственниками (встречи, совместные обеды...)	1 – 2 – 3 – 4 – 5
21. Обращаемся к профессиональному психологу для помощи в решении семейных проблем.	1 – 2 – 3 – 4 – 5
22. Верим, что мы в состоянии справиться со своими проблемами.	1 – 2 – 3 – 4 – 5
23. Принимаем участие в религиозных/духовных мероприятиях.	1 – 2 – 3 – 4 – 5
24. Формулируем семейную проблему в более позитивном свете, чтобы совсем не падать духом.	1 – 2 – 3 – 4 – 5
25. Спрашиваем родственников о том, что они думают о наших проблемах.	1 – 2 – 3 – 4 – 5
26. Чувствуем, что, как бы мы не подготавливали себя к возможным проблемам, мы будем испытывать трудности с их решением.	1 – 2 – 3 – 4 – 5
27. Просим совета у религиозного/духовного деятеля/лидера.	1 – 2 – 3 – 4 – 5
28. Верим, что если ждать достаточно долго, проблема уйдет.	1 – 2 – 3 – 4 – 5
29. Делимся проблемами с соседями.	1 – 2 – 3 – 4 – 5
30. Верим в Бога.	1 – 2 – 3 – 4 – 5

## General Health Questionnaire (GHQ-12; translation of Goldberg, 1992)

Используя шкалу, ответьте на вопросы о вашем здоровье:

**0 = Совсем нет**

**1 = Не больше, чем обычно**

**2 = Больше, чем обычно**

**3 = Намного больше, чем обычно**

**За последние две недели...**

1. Были ли вы способны сосредоточиться на том, что Вы делали?	0 – 1 – 2 – 3
2. Бывало ли, что заботы мешали вам спать?	0 – 1 – 2 – 3
3. Чувствовали, что играете важную роль в происходящем?	0 – 1 – 2 – 3
4. Чувствовали ли вы, что способны принимать важные решения?	0 – 1 – 2 – 3
5. Испытывали ли вы постоянное напряжение?	0 – 1 – 2 – 3
6. Чувствовали ли вы себя не в состоянии преодолеть трудности?	0 – 1 – 2 – 3
7. Могли ли вы получать удовольствие от своих обычных повседневных занятий?	0 – 1 – 2 – 3
8. Были ли вы способны справляться со своими проблемами?	0 – 1 – 2 – 3
9. Чувствовали ли вы себя несчастным или подавленным?	0 – 1 – 2 – 3
10. Чувствовали ли вы, что потеряли веру в себя?	0 – 1 – 2 – 3
11. Думали ли вы о себе, как о ничтожном человеке?	0 – 1 – 2 – 3
12. Чувствовали ли Вы себя достаточно счастливым?	0 – 1 – 2 – 3

**Perceived Ethnic Density - Composite (ED; translation and extension of Stafford et al., 2009)**

Оцените приблизительно, какая часть населения вашего района (15-20 минут ходьбы от вашего дома) принадлежит к той же национальности, что и вы?

Ни одного человека или очень мало людей	0
Менее половины населения района	1
Около половины населения района	2
Более половины населения района	3
Почти все или все население района	4

1. Укажите, есть ли в вашем районе (15-20 минут ходьбы от вашего дома) магазины, где вы можете купить продукты, характерные для вашей родной страны/культуры (например, магазин с товарами и продуктами из России, если вы относитесь к русской культуре/национальности)?

Таких магазинов нет	0
Ограниченное количество	1
Небольшое количество	2
Умеренное количество	3
Большое количество	4

2. Укажите, в какой степени вы можете использовать свой родной язык для общения с жителями вашего района (например, при разговоре с соседями или продавцами местных магазинов, вы можете говорить на вьетнамском, если вы из Вьетнама).

Я не могу использовать свой родной язык	0
Могу в ограниченной степени	1
Могу в некоторой степени	2
Могу в умеренной степени	3
Могу в значительной степени	4

3. Укажите, есть ли в вашем районе (15-20 минут ходьбы от вашего дома) организации, которые предоставляют услуги людям вашей национальности/этнической группы (например, китайский общественный центр, если вы – китаец).

Таких организаций нет	0
Ограниченное количество	1
Небольшое количество	2
Умеренное количество	3
Большое количество	4