Second language specific health communication anxiety in Canadian Russian-speaking

immigrants: How it affects willingness to use second language mental healthcare services

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Abstract

The percentage of the Canadian population that reports being or having been an immigrant has been steadily increasing for the past 50 years, such that more than 20% of Canada's population identifies as foreign-born. As a result, a large proportion of the users of healthcare find themselves in language discordant situations in a healthcare system that they might not be comfortable navigating. The problems associated with using one's second language (L2) in a healthcare setting might be especially salient in the mental healthcare context, where the quality of diagnosis, treatment, and overall services is highly dependent on language. How does the anticipation of having to use one's second language affect immigrants' experience of the seeking and obtaining mental healthcare services? Are there factors in immigrants' social environment that might influence this experience? This thesis investigates the role of second language communication anxiety in the context Russian-speaking immigrants' use of mental healthcare services in their L2 (HCA_{2m}). First, the link between HCA_{2m} and immigrants' willingness to use L2 mental healthcare services is investigated. Second, predictive certainty, or immigrants' confidence in their ability to predict how interactions and treatment in an L2 context will unfold, and their actual predicted outcome are investigated as potential components of the mechanism that underlies the association between HCA_{2m} and willingness. Finally, the role of

immigrants' social networks is investigated in order to understand how social variables might play a role in the hypothesized mediation model. Results indicated that HCA_{2m} was negatively associated with the willingness to use L2 mental healthcare services and that this relationship was entirely mediated by immigrants' predictive certainty, such that higher HCA_{2m} was associated with lower predictive certainty, which was associated with reduced willingness to use L2 mental healthcare. Finally, the results of this project failed to support the hypothesis that certain characteristics of immigrants social network are associated with predictive certainty, suggesting that perhaps the nature of one's L2 social network does not play a role in modulating the mechanism by which HCA_{2m} affects the willingness to use L2 mental healthcare services.

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Last but not least, I would like to thank all the research participants who made this project possible.

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According to Statistics Canada's 2016 Census, 21.9% of Canada's population identifies as being or having been a landed immigrant (Statistics Canada, 2017a), and this percentage is projected to increase by an additional 5 to 10% by 2036 (Statistics Canada, 2017b). With an increasing percentage of the population being immigrant, an increasing number of patients in Canada's healthcare system receive services in a language discordant context, that is, in a context where the healthcare provider and the patient do not speak the same mother tongue. Indeed, even though the vast majority of immigrants, 93.2% as reported by Statistics Canada (2017a), is able to conduct a conversation in either French or English, only 27.5% of them have French or English as their mother tongue. Therefore, the 65.7% of immigrants who do not have French or English as their first language (L1) but are able to converse in one or the other of the two official languages is likely to find themselves in a language discordant healthcare context without receiving help from an interpreter. Such language discordant healthcare contexts create challenges for both health practitioners as well as patients and are associated with reduced access to healthcare and reduced use of healthcare services. In addition, language discordant healthcare contexts have consequences on communication within the healthcare setting and the quality of care. Patients are likely to experience difficulties with navigating and managing their healthcare in a second language (L2) setting. Furthermore, the impact of language discordance is likely to be greatest in mental healthcare, where diagnosis and treatment are almost exclusively based on communication.

Language Barriers to Mental Healthcare Access

Language discordance as a barrier in healthcare has long been recognized as a major contributor to unequal access to quality healthcare among linguistic minorities (Floyd & Sakellariou, 2017; Jacobs, Chen, Karliner, Agger-Gupta, & Mutha, 2006; Kohlenberger, Buber-Ennser, Rengs, Leitner, & Landesmann, 2019; Ohtani, Suzuki, Takeuchi, & Uchida, 2015; Segalowitz & Kehayia, 2011; Terui, 2017; Timmins, 2002). Lack of proficiency in the mainstream language has been associated with a paucity of available accommodations, as well as with discrimination within the healthcare system and by healthcare providers, with healthcare providers often expressing negative attitudes towards patients with low or insufficient proficiency (de Moissac & Bowen, 2017; Steinberg, Valenzuela-Araujo, Zickafoose, Kieffer, & DeCamp, 2016). The self-reported health of migrants with poorer mainstream language skills has been shown to decrease much more dramatically in the first four years of residence in Canada than the self-reported health of migrants with good mainstream language proficiency (Ng, Pottie, & Spitzer, 2011). Lack of language proficiency has also been found to be related to reduced satisfaction with care and decreased willingness to seek care in the future (Carrasquillo, Orav, Brennan, & Burstin, 1999), and a lowered willingness to seek preventative healthcare services and screening (Sentell, Braun, Davis, & Davis, 2013; Timmins, 2002).

In mental healthcare, language barriers have been found to be especially pronounced and consequential. Multiple studies highlight the fact that ethnic and linguistic majority patients are more likely to access needed mental healthcare services than ethnic and linguistic minorities (Alegria et al., 2007; Bauer, Chen, & Alegría, 2010; Kang et al., 2010; Keyes et al., 2012; Kim et al., 2011; Pumariega, Glover, Holzer, & Nguyen, 1998). For example, Fiscella, Franks, Doescher, and Saver (2002) reported that non-Hispanic whites were twice as likely to use mental

healthcare services in the past year as Spanish-speaking Hispanics in the United States (U.S.). In addition, differences in access exist even within ethnic and linguistic minority groups. Ethnic and linguistic minorities in the U.S. and Canada who report being less proficient in English are less likely to have used mental healthcare services over the last 12 months and/or over their lifetime as compared to members who report good English proficiency (Alegria et al., 2007; Bauer et al., 2010; Kang et al., 2010; Keyes et al., 2012; Kim et al., 2011; Le Meyer, Zane, Cho, & Takeuchi, 2009; Pumariega et al., 1998). Bauer et al. (2010) reported that among Latinos and Asians residing in the U.S. limited English proficiency was associated with longer lifetime duration of untreated mental health disorders and reduced mental healthcare use. Although the negative relationship between language barriers and mental healthcare access was found to be true for both ethnic minority members who were U.S.-born citizens as well as migrants in the above studies, migrants were especially vulnerable to language barriers to mental healthcare. Le Meyer et al. (2009) observed that in a sample of Asian Americans the rate of use of mental healthcare services among U.S.-born patients with psychiatric disorders was almost twice the rate reported by immigrant patients. Similarly, Alegria et al. (2007) reported that primarily English-speaking and U.S.-born Latinos used significantly more mental healthcare services (14.7% had used them in the past 12 months in their sample) than foreign-born and primarily Spanish-speaking Latinos (9.1% had used mental healthcare services in the past 12 months). As such, it is crucial to take into account immigrant status when studying language barriers to mental healthcare access in linguistic minorities.

Second-language health communication anxiety as a linguistic barrier to mental healthcare access. The above findings highlight the need for a better understanding of how linguistic barriers reduce mental healthcare use and access. What impedes ethnic minority L2

speakers of a majority language from seeking and accessing healthcare, and specifically mental healthcare, services? What is the nature of linguistic barriers to mental healthcare access? Terui (2017) proposed a model of linguistic barriers in healthcare and how they influence access. According to this model, language barriers influence access because a) not enough resources are available to help patients set up appointments and communicate effectively with professionals within healthcare settings and b) language barriers reduce health literacy among patients, which is the "the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions" (Paasche-Orlow & Wolf, 2007, p. S20). However, we believe that health barriers affect access to healthcare in another important way that has not be given due consideration in research so far: Patients might be reluctant to use healthcare services when these are in their L2 because they might experience an L2-specific health communication anxiety (HCA_2) (Zhao, Segalowitz, Voloshyn, Chamoux, & Ryder, in press). In the case of mental healthcare, we believe that HCA_2 is also mental health specific (HCA_{2m}), that is, distinct from HCA_2 for physical health issues. This is because the nature of mental healthcare is such that it depends much more heavily on language than physical healthcare does for diagnosis and treatment (Zhao et al., in press).

HCA_2 is distinct from a more generalized version of L2 communication anxiety (L2-GCA), defined as "the feeling of tension and apprehension specifically associated with second language [or third, or fourth language, etc.] contexts, including speaking, listening, and learning" (MacIntyre & Gardner, 1994, p. 284). L2-GCA is not bound by context and can be experienced in every situation where an individual is communicating in their L2. In contrast, HCA_2 is solely experienced in the L2 healthcare context. Additionally, HCA_2 is also distinct from health communication anxiety (HCA) that is not specific to communication in the L2 and is defined as

the "anxiety of disclosing concerns to one's doctor" (Booth-Butterfield, Chory, & Beynon, 1997, p. 235). Both L2-GCA and HCA are likely to be in part confounded with HCA_2 as they likely contribute to the overall anxiety individuals experience when they have to communicate in their L2 in a healthcare setting. As such, Zhao et al. (in press) emphasize the importance of controlling for L2-GCA and HCA when assessing HCA_2.

Zhao et al. (in press) found that as HCA_2 increases, the willingness to use L2 physical and mental healthcare services among Canadian-Anglophones in Quebec, where they are a linguistic minority, decreases. This effect was larger for mental healthcare contexts as compared to physical healthcare contexts. In their study, Anglophones were less willing to utilise physical and mental healthcare services in French if they reported higher HCA_2, even when L2-GCA, HCA, and L2 language proficiency were controlled for. This highlights the fact that HCA_2 is a unique contributor to patients' willingness or reluctance to seek L2 healthcare services and thereby constitutes a distinct linguistic barrier to healthcare access. Given the particular challenges associated with language barriers for immigrants in mental healthcare, the first objective of the current project is to investigate in a sample of Russian-speaking immigrants in Canada the relationship between the mental health-specific HCA_2 and willingness to use L2 mental healthcare services as had been reported by Zhao et al. (in press) with an Anglophone non-immigrant linguistic minority population. Russian-speaking immigrants are an especially critical immigrant group to study as they are known to experience increased difficulty adapting to the host society, have elevated rates of mental illness, and underutilize mental healthcare services (Jurcik, Chentsova-Dutton, Solopieieva-Jurcikova, & Ryder, 2013; Leipzig, 2006).

Communication and Quality of Care in L2 Mental Healthcare

As previously mentioned, language discordance can stand in the way of effective communication and quality of care. It is known that communication problems created by language discordance can sometimes have fatal consequences in the healthcare context (Divi, Koss, Schmaltz, & Loeb, 2007; Flores, 2006) and quality of care can be compromised even when patients have access to interpreters (Elkington & Talbot, 2016; Flores, 2005; Searight & Armock, 2013; Tribe & Tunariu, 2009; White et al., 2018). Lack of mainstream language proficiency has been shown to be associated with longer wait times for follow-ups on abnormal test results (Karliner, Ma, Hofmann, & Kerlikowske, 2012), poorer health status (Timmins, 2002), an increased incidence of adverse events related to communication errors in a hospital setting (Divi et al., 2007), poorer glycemic control among patients with diabetes (Fernandez et al., 2011), a lower likelihood of having a consistent provider of medical care (Kirkman-Liff & Mondragon, 1991), a lower likelihood of seeking preventative care (Woloshin, Schwartz, Welch, & Katz, 1997), an increased likelihood of being diagnosed with severe mental illness (Marcos, Urcuyo, Kesselman, & Alpert, 1973) and experience complications related to prescription medication. Furthermore, when in a language discordant situation, patients resort to compensatory behaviours that can be harmful (e.g. utilizing incidental interpreters, stringing together fragments of multiple languages, and using body language) by leading to medical errors and adverse health outcomes (Abdelrahim et al., 2017).

Predictive certainty and predicted outcomes in mental healthcare as a mediating factor of the relationship between HCA$_2$ and the willingness to use L2 mental healthcare services. In addition to establishing an association between HCA$_2$ and the willingness to use L2 mental healthcare services, this project also aimed to investigate the role of factors that might

underlie the relationship between these two variables. Potential mediators have been suggested by Zhao (2017), who applied Gudykunst's (1985) Anxiety/Uncertainty Management Theory (AUM) to the language-discordant health communication context. AUM theory conceptualizes the relationship between uncertainty and anxiety in intergroup communication. Uncertainty, as defined within the AUM framework, refers to individuals' "ability to predict and explain others' attitudes, feelings, and behaviours" (Gudykunst & Nishida, 2001). This uncertainty is associated with an anxiety provoked by perceived social incompetence in the intercultural context, lack of trustworthiness, miscommunication, and misunderstanding of social rules (Stephan, Stephan, & Gudykunst, 1999). The effectiveness of communication within an intercultural, language discordant, context depends on individuals' ability to manage the anxiety and uncertainty inherent to the interaction (Gudykunst, 1998; Gudykunst & Nishida, 2001). Indeed, when anxiety and/or uncertainty are high, individuals are likely to disengage with communication or rely on simplistic information processing, such as relying on stereotypes, which decreases effective communication (Gudykunst, 1995).

Applied to the language-discordant context, AUM theory implies that immigrants' inability to predict how communication and treatment will unfold within an L2 mental healthcare setting might explain the association between HCA_2 and an unwillingness to utilise L2 mental healthcare services. In our study, we operationalized uncertainty as its opposite concept, *predictive certainty* (prCER), which is immigrants' confidence in their ability to predict how communication and treatment will unfold in the L2 mental healthcare context. Zhao (2017) additionally suggested that the relationship between HCA_2 and one's willingness to use L2 mental healthcare services might be explained by a fear of adverse outcomes, possible errors, and misunderstandings associated with language-discordant healthcare contexts. Indeed, immigrants

with high HCA_2 might be unwilling to seek L2 mental healthcare services because their *predicted outcomes* (prOUT) for communication and treatment in this context are especially negative. As such, both prCER and prOUT might underlie the relationship between HCA_2 and willingness to use L2 mental healthcare services.

  Predictive certainty in seeking mental healthcare. Although all interpersonal communication contains a certain level of uncertainty and produces some anxiety (Berger & Calabrese, 1975), the intercultural, and by extension language-discordant, context is likely to be fraught with more uncertainties and be more anxiety-provoking (Gudykunst & Nishida, 2001; Gudykunst, Nishida, & Chua, 1986; Gudykunst & Shapiro, 1996). Uncertainties can arise because interlocutors have less experience interacting with members of one another's respective cultural and linguistic groups and as such tend to rely on vague conceptions of the other's social identities. In addition, uncertainty is also present when there are challenges inherent to having to speak in an L2. Samochowiec and Florack (2010) have shown that when communication anxiety is present, individuals are less willing to interact with a poorly predictable partner as opposed to an easily predictable one. Similar findings have been reported in the context of healthcare communication. Logan, Hunt, and Steel (2016) found that when individuals' confidence in their predictions about a conversation with a health professional with an ethnolinguistic background different from theirs was manipulated to be low, individuals were likely to experience more anxiety that increased their avoidance of intercultural interactions in the context of healthcare in the future.

  Given that effectiveness of communication and engagement with healthcare providers is essential to accurate diagnosis and quality care within the mental healthcare context, and that uncertainty has been associated with reduced communication efficacy and avoidance of

communication, it is important to understand the role of uncertainty in association with immigrants' HCA_2 and their willingness to utilise L2 mental healthcare services. Considering AUM theory's postulated links between anxiety, uncertainty, and the willingness to communicate in an intercultural context and Samochowiec and Florack's (2010) and Logan et al.'s (2016) findings, part of the second objective of our project was to investigate the role of prCER as a *mediator* of the relationship between HCA_2 and the willingness to use L2 mental healthcare services.

      Predicted outcomes of seeking mental healthcare. As mentioned earlier, it is important to distinguish between prCER and prOUT. It might be that immigrants also make negative predictions about how communication will unfold within an L2 mental healthcare setting and about the quality of the treatment outcome, which can affect their willingness to utilise the L2 services and explain their anxiety about communicating in the L2 setting. Research into help-seeking behaviour has pinpointed perceived positive and negative outcomes of seeking mental healthcare services to be a key factor in making the decision to look for professional help for mental health problems (Lueck, 2018; Vogel, Wei, Boysen, & Wester, 2005). Believing that mental health services will be helpful and beneficial is known to increase the willingness to see professional mental healthcare (Rickwood, Deane, Wilson, & Ciarrochi, 2005; Rughani, Deane, & Wilson, 2011; Umubyeyi, Mogren, Ntaganira, & Krantz, 2016). Beliefs that mental health services will be useful (e.g. will alleviate problems) and carry little risk (e.g. the individual will not be judged, misunderstood, dismissed, ignored, receive inappropriate care, or waste resources on ineffective treatment) are also associated with an increased willingness to seek mental health help (Li, Dorstyn, & Denson, 2014; Vogel, Wester, & Larson, 2007). Finally, having had positive past experiences with mental healthcare services is strongly associated with an increased

likelihood of wanting to seek mental health services in the future because individuals expect the outcomes of future help to be positive as well (Bowling et al., 2012; Rickwood et al., 2005; Watsford & Rickwood, 2014). Because prCER and prOUT might be somewhat associated with each other, there is a need to measure both of these so that their separate mediating roles, if any, can be assessed. Furthermore, it is also possible that higher HCA_2 leads to lower prCER, which is in turn associated with increasingly negative prOUT and leads to decreased willingness to use L2 mental healthcare services.

Some evidence supports the notion that Russian immigrants might be especially prone to make negative predictions about how treatment will unfold in an L2 mental healthcare setting. Drob, Tasso, and Griffo (2016) investigated the attitudes towards mental healthcare of Jewish-Russian immigrants' from the former Soviet Union living in the United States. Their results suggest that Jewish-Russian immigrants in the U.S. have negative attitudes towards seeking psychological help, do not believe that the help will be useful and lead to positive outcomes, and have especially low intentions to seek mental healthcare services. When comparing scores of their sample on these variables to those of a sample of U.S. college students and another two samples from Iceland, Drob et al. (2016) observed that their immigrant sample scored lower (i.e. had more negative attitudes towards psychological help, had lower expectations that mental health services can be helpful, and were less likely to intent to seek mental healthcare) than both Icelandic samples. Furthermore, Jewish-Russian immigrant women in their sample also scored lower than women in the U.S. sample (although men in their sample did not score lower than non-immigrant U.S. men). Even though Drob et al. (2016) did not specifically investigate Russian immigrants' attitudes about L2 mental healthcare, these results underscore the possibility that negative attitudes, and therefore the predictions they might make about L2 mental

healthcare might explain the relationship between HCA_2 and the willingness to use L2 mental healthcare services.

Given the findings presented thus far, part of the second objective of our study was to investigate prCER and prOUT as part of the mechanism that explains the association between HCA_2 and willingness to use L2 mental healthcare services.

Social networks' characteristics and their role in modulating the relationship between HCA_2 and the willingness to use L2 mental healthcare services. Social networks have long been recognized as essential components of immigrants' acculturation to their host community (Kuo & Yung-Mei, 1986). To immigrants, social networks are both a source of support and a source of essential information about their host community (Caidi, Allard, & Quirke, 2010). Furthermore, L2 social networks are known to contribute to L2 learning, such that immigrants with more L2 speakers in their social networks have higher L2 communicative competence (Cenoz & Valencia, 1993; Smith, 2002). Social networks are known to be especially important for Russian-speaking immigrants' integration and adaptation to the host society (Jurcik et al., 2013; Jurcik et al., 2015; Ritsner, Ponizovsky, & Ginath, 1997). Indeed, reliance on social networks and informal means of obtaining goods and services is an integral part of the Slavic culture which often becomes a central coping mechanism of Russian-speaking immigrants throughout the process of migration (Jurcik et al., 2013; Ledeneva, 2008; Ritsner et al., 1997). In a longitudinal study with Russian-speaking immigrants in Israel, Ritsner et al. (1997) report reduced distress associated with adjusting to migration in immigrants who had greater social support from friends and family. Lower distress among Russian-speaking immigrants who reported greater perceived social support in ethnically-dense Russian-speaking neighborhoods in Montreal was also observed by Jurcik et al. (2015).

Because of the central role of social networks in immigrants' lives, we were interested in looking at how social network characteristics might modulate the relationship between HCA_2 and the willingness to use L2 mental healthcare services. More specifically, we wanted to investigate the effect social network characteristics might have on the presumed mediators, prCER and prOUT, of this relationship. In addition, we wanted to compare the effect of immigrants' L1 versus L2 social networks, to establish whether the two might have separate and distinct influences on prCER and prOUT. Although L1 social networks seem to be particularly important for support and information exchange in the case of Russian-speaking immigrants (e.g., Jurcik et al., 2015), L2 social networks are likely to play an important role in accessing L2 healthcare services as well as acquiring and mastering the necessary L2 skills that might influence health communication anxiety, the uncertainty related to communication, and the predicted outcomes of immigrants in the context of healthcare.

Social networks can be characterized by a multitude of factors. In this project, we were interested in six network-level (Valente, 2010) social network characteristics: size, density, interconnectedness, number of triads, closeness, and ethnolinguistic diversity. Size refers to the number of individuals that are nominated as being part of a participant's social network. Density is an indicator of the quantity of connections within a social network and is operationalized as the number of connections between the individuals in a social network divided by the total number of possible connections between these individuals. A connection is present when one person in the social network knows someone else in the same network. A closely related, but distinct, characteristic is interconnectedness, or the number of non-isolated individuals within a social network divided by the size of the social network. An individual needs to know at least one other person in the social network to be considered as non-isolated. A characteristic that has

been specifically created for this project is the number of triads within a social network. Number of triads is operationalized as the number of pairs of individuals who know each other and who the participant has reported as having observed communicating with each other with a frequency of at least "less than once a month" or more. The idea of including triads as a social network feature is that a triad provides opportunities for the participant to observe some communication norms in action among native speakers. Closeness is the level of intimacy the participant reports between him or herself and each individual they nominated as part of their social network. Finally, ethnolinguistic diversity refers to the number of ethnolinguistic groups represented within a social network. Each of these characteristics might have a unique influence on L2 healthcare communication.

Social network characteristics' relationship to mental healthcare use. In non-immigrant populations, social networks are known to play an important role in mental healthcare use (Vogel, Wade, Wester, Larson, & Hackler, 2007). For example, Vogel, Wade, et al. (2007) report that having at least one member of one's social network who has utilized mental healthcare services is associated with positive attitudes about mental healthcare services and expectations of positive outcomes from seeking mental healthcare. Similarly, Vogel, Wade, et al. (2007) report that amongst individuals seeking mental healthcare, 75% report having been recommended to do so by a member of their social network, and 94% report knowing someone who has sought help in the past. The level of support and closeness within a social network has also been shown to be an important factor in promoting mental healthcare use. Indeed, Rickwood and Braithwaite (1994) report an association between level of social support within one's social networks and the likelihood to seek mental healthcare, such that higher social support was associated with an increased likelihood of seeking mental health services.

Social network characteristics besides size and closeness might also be relevant in immigrants' mental healthcare seeking behaviour. For example, interconnectedness within immigrants' L2 social networks, that is the number of L2 social network members who know at least one other L2 member within the same social network, has been associated with lower communication-related acculturative stress (Doucerain, Varnaamkhaasti, Segalowitz, & Ryder, 2015). The authors suggest this association is potentially due to a immigrants' higher incidence of exposure to naturalistic L2 use within their L2 social networks, which foster L2 competence. Therefore, interconnectedness within L2 social networks might play an important role in modulating the relationship between HCA_2 and the willingness to use L2 mental healthcare services.

Our project additionally investigated the role of two other social network characteristics that are quite similar to interconnectedness but might play a slightly different role in this relationship: density, which is the number of members within immigrants' social networks who know each other divided by the total possible number of connections between social network members, and the number of triads, which is the number of pairs of social network members. Since Doucerain et al. (2015) did not find the density of L2 social networks to be related to communication-related acculturative stress, we wanted to include this variable for purposes of comparison to the role of interconnectedness in our own study. The number of triads within L2 social networks can also be interesting to look at as it would be a more direct measure of exposure to the naturalistic use of an L2 in a social context than interconnectedness.

In addition, ethnolinguistic diversity of immigrants L2 social networks might be another important modulating characteristic. A more ethnolinguistically diverse social network is likely to be associated with tolerance for ambiguity, a psychological trait that has been associated with

increased L2 and multilingual proficiency (Chapelle & Roberts, 1986; Dewaele & Wei, 2013).

Conversely, reduced tolerance for ambiguity is known to be associated with higher levels of L2

communication anxiety in L2 learners (Genç, 2016). As such, the ethnolinguistic diversity of

immigrants' social networks might also modulate anxiety and uncertainty within mental

healthcare contexts.

The Current Study

The current project aimed to investigate the role of second-language (L2)- and mental

health-specific health communication anxiety (HCA_{2m}) in Russian-speaking immigrants'

willingness to use L2 mental healthcare services as well as the mechanism by which these two

variables might be associated. Specifically, we wanted to look at the role of immigrants'

confidence in their ability to predict how communication and treatment will unfold in an L2

mental healthcare context (their L2- and mental healthcare-specific predictive certainty;

$prCER_{2m}$) as well as the actual outcomes they predict for communication and treatment within

the L2 mental healthcare context (their L2- and mental healthcare-specific predicted outcomes;

$prOUT_{2m}$). A two-mediator model was tested to investigate these relationships, with HCA_{2m} as

the predictor, $prCER_{2m}$ as the first mediator, $prOUT_{2m}$ as the second mediator, and the

willingness to use L2 mental healthcare services as the outcome. To establish the L2 and mental

healthcare specificity of HCA_{2m}, $prCER_{2m}$, $prOUT_{2m}$, and the willingness to use L2 mental

healthcare services we needed to integrate the appropriate controls into our study. The first-

language (L1) counterparts of HCA_{2m}, $prCER_{2m}$, $prOUT_{2m}$, and the willingness to use L2 mental

healthcare services needed to be controlled for, since health communication anxiety in an L1,

poor L1 predictive certainty, negative L1 predicted outcomes, and an avoidance of L1 mental

healthcare services are likely to contribute to increased HCA_{2m}, decreased $prCER_{2m}$, poor

prOUT$_{2m}$, and an avoidance of L2 mental healthcare services. HCA$_{2m}$, prCER$_{2m}$, prOUT$_{2m}$, and the willingness to use L2 mental healthcare services also needed to be distinct from their physical health counterparts since part of the anxiety related to mental healthcare might be in fact a general HCA$_2$ associated more to communicating about one's physical and health issues in general. Therefore, the L2 physical health counterparts of HCA$_{2m}$, prCER$_{2m}$, prOUT$_{2m}$, and the willingness to use L2 mental healthcare services were controlled for. Furthermore, general L2 communication anxiety (L2-GCA) and general L2 language skills might also be confounding factors since they are likely to be a component of HCA$_{2m}$, prCER$_{2m}$, prOUT$_{2m}$, and the willingness to use L2 mental healthcare services measure, and as such were controlled for. Finally, we also controlled for immigrants' experience with L1 physical and mental healthcare services so that our results are not dependent on immigrants' experience with the L2 healthcare system, which is very likely associated with HCA$_{2m}$, prCER$_{2m}$, prOUT$_{2m}$, and the willingness to use L2 mental healthcare services.

In addition, this project aimed to investigate the role of social network characteristics on the mediating mechanism linking HCA$_{2m}$ and the willingness to use L2 mental healthcare services. As such, the objective was to identify the social network characteristics that modulate the mediator or mediators found to be important in explaining the relationship between HCA$_{2m}$ and the willingness to use L2 mental healthcare services.

We hypothesized that:

(1) Russian-speaking immigrants' HCA$_{2m}$ will be significantly and negatively associated with their willingness to use L2 mental healthcare services.

(2) prCER$_{2m}$ and prOUT$_{2m}$ will be significant mediators of the relationship between Russian-speaking immigrants' HCA$_{2m}$ and their willingness to use L2 mental

healthcare services. Specifically, there will be a significant and negative association between HCA_{2m} and $prCER_{2m}$ and significant positive associations between $prCER_{2m}$, $prOUT_{2m}$ and the willingness to use L2 mental healthcare services. Therefore, greater HCA_{2m} will lead to reduced $prCER_{2m}$, which in turn will be associated with reduced $prOUT_{2m}$, and the later will predict a reduced willingness to use L2 mental healthcare services.

(3) Social network characteristics will be significantly associated with the mediators of the relationship between HCA_{2m} and the willingness to use L2 mental healthcare services ($prCER_{2m}$ and/or $prOUT_{2m}$, depending on which will be found to be a significant mediator). In general, we hypothesized that larger, denser, more interconnected social networks with a larger number of triads, that are composed of individuals who are closer to participants and are more ethnolinguistically diverse will be associated with greater $prCER_{2m}$ and better $prOUT_{2m}$.

Methods

Participants

The study used a community sample of participants that (a) had Russian as their first or primary language (i.e. felt most comfortable speaking Russian in their everyday lives); (b) could speak at least some French and/or English; (c) were 18 or older; (d) and resided in Canada. Participants were recruited via online and newspaper Russian language advertisements, as well as pamphlets posted in shops and apartment buildings. By taking part in the study, the participants were entered into a random draw for three prizes of $100 each.

Demographics. Data were collected from 85 participants. The sample included 19 males and 66 females aged 20 to 72 years with a mean age of 38.45 ($SD = 9.92$). Participants reported

having spent between three months and 23 years in Canada, with a mean of 8.49 years ($SD =$ 5.92). They left their home country when they were, on average, 29.88 years old ($SD = 10.28$), with the minimum age being seven years old and the maximum being 69. Five participants reported having been born in Belarus, five in Kazakhstan, three in Kyrgyzstan, six in Moldova, 38 in Russia, 14 in Ukraine, one in Uzbekistan, one in Georgia, one in Canada, and 11 identified their birth country as the Union of Soviet Socialist Republics (USSR). Sixty-seven participants reported currently residing in Quebec, whereas eight reside in Ontario, three reside in Nova Scotia, one resides in Alberta, four reside in British Columbia, and two reside in Manitoba. One participant reported their highest education to be middle school, eleven reported that it was college or a professional degree, 48 reported having obtained an undergraduate degree, and 25 reported that they had a graduate degree. At the time of taking the survey, 50 participants reported being employed full-time, six reported being employed part-time, one reported being retired, 16 reported that they are students, and 12 reported being unemployed.

  Language use and proficiency. Forty-two participants reported that their most often required Canadian official language was French, and 43 reported that it was English. Participants self-rated their proficiency in their various languages and on various skills, using a 5-point Likert-type Language Proficiency Scale, where "1" = "No or almost no ability" and "5" = "Native or near native-like ability". Participants listing English as their L2 reported their speaking ability to be, on average, 4.14 ($SD = 0.94$) on while the L2 French speakers reported it to be 3.74 ($SD = 0.94$). The average listening ability of L2 English participants was 4.09 ($SD =$ 1.09) while the average listening ability of L2 French participants was 3.86 ($SD = 0.95$). The average writing ability of L2 English participants was 4.09 ($SD = 1.02$) while it was 3.45 ($SD =$ 1.11) for L2 French participants. L2 English participants reported their reading ability to be, on

average, 4.33 (SD = 0.99) while L2 French participants' average reading ability was 3.93 (SD = 0.97). Participants indicated that they used Russian, on average, 48.13% (SD = 21.83) of the time on a typical day, with a range from 0% to 95% of the time. Participants who indicated that their L2 was English reported that on average they used English 42.44% (SD = 21.99) of the time on a typical day, with a range from 5% to 90% of the time. Participants with L2 French reported that they used French 38.10% (SD = 21.20) of the time on a typical day, with a range from 10% to 95% of the time. Finally, some participants also listed one (or more) other languages. These included one participant reporting French as their third language (L3), 10 reporting Hebrew, one reporting Kyrgyz, three reporting Romanian, 12 reporting Ukrainian, two reporting Byelorussian, five reporting Spanish, one reporting Arabic, one reporting Italian, three reporting German, one reporting Portuguese, two reporting Polish, and one reporting Tatar. Among these participants, five participants reported that they spoke two of these languages (i.e. one of them was their L3 and one was their L4). On average, participants used their L3 5.51% (SD = 13.68) of the time on a typical day, with a range from 0% to 60% of the time.

Measures

The measures were administered via an online questionnaire that the participants completed at a time that was convenient for them. Demographic variables were measured via a standard set of questions, presented at the end of the questionnaire. The entire questionnaire was administered in Russian. The reliability estimates for the measures were all obtained via the `alpha` function in R (`psych` package).

Language Background Questionnaire (LBQ). The language background questionnaire was designed to elicit self-report assessments of participants' language proficiency in Russian, French or English, and their L3 (if they speak one), as well as the percentage of their daily

interactions that occur in each language—that is, in Russian (L1), in "English or French" (whichever was their preferred L2), and in their L3. The LBQ also contained 5-point Likert-type Language Proficiency Scales for self-rating of reading, listening, writing, and speaking abilities ranging from "1" ("No or almost no ability") to "5" ("Native or near native-like ability").

Second-language general communication anxiety (L2-GCA) questionnaire. The L2-GCA questionnaire consists of seven items measuring the participants' general L2 communication anxiety, that is, communication anxiety that is experienced when participants speak their L2 regardless of the context (see Appendix A). The L2-GCA scale was in part derived from the revised Cheek and Buss Shyness Scale (Cheek & Buss, 1981) and adapted for an L2 communication context. Items 3 and 8 of the original Revised Cheek and Buss Shyness Scale were dropped as they could not be adapted to the L2 communication context. Items 1, 2, and 7 were directly taken from the original Revised Cheek and Buss Shyness Scale (item 2 was positively phrased and had to be reverse scored in analyses). The other 4 items of the L2-GCA scale were developed based on situations that are likely to be relevant in the L2 communication context (asking for information, shyness, acting natural, and feeling of social competence when speaking in an L2). L2-GCA scale showed very good internal reliability (Cronbach's α = .94, 95%CI[.92, .96]).

Health communication anxiety (HCA) questionnaire. This health communication anxiety (HCA) questionnaire (see Appendix B) addresses health communication in the participants' L1 and L2 in the context of physical and mental healthcare. This 4-item questionnaire measures the participants' communication anxiety in their L1 and L2 languages and in the contexts of physical or mental healthcare. It is important to note that participants are not asked to think about seeking help for mental health problems as such but rather, they are

asked to imagine seeking help for "emotional difficulties". This is done in order to avoid triggering as much as possible the stigma attached to having a diagnosed mental illness, which might bias participants in their responses (e.g. they might systematically respond that they would not use mental healthcare services for dealing with mental health problems because of the attached stigma). Because mental health problems were operationalized as emotional difficulties in all of our questionnaires, we will refer to mental healthcare as mental/emotional healthcare from this point on. There are four versions of the HCA questionnaire to cover the four language-by-context combinations: L1 HCA in the physical healthcare context (L1-HCAp), L2 HCA in the physical healthcare context (L2-HCAp), L1 HCA in the mental/emotional healthcare context (L1-HCAm), and L2 HCA in the mental/emotional healthcare context (L2-HCAm). The HCA scales consisted of seven items each and participants rated each item on a scale from 1 ("Strongly disagree") to 7 ("Strongly agree").

Reliability was found to be very good for all four scales as evidenced by the high Cronbach's α's: L1-HCAp: Cronbach's α = .90, 95%CI[.86, .93]; L2-HCAp: α = .95, [.93, .96]; L1-HCAm: α = .89, [.85, .93]; L2-HCAm: α = .96, [.95, .98].

There was also evidence of internal validity for the HCA scales. Convergent validity was supported by a positive correlation between participants' mean L2-HCAp scores and their preference for L1 physical healthcare services (r = .46, [.27,.61]) and between mean L2-HCAm and the preference for L1 mental/emotional healthcare services (r = .64, [.49, .75]). This indicated that the more anxiety participants had about communicating in their L2 in a healthcare context, the more they preferred using L1 healthcare services over L2 services. Convergent validity was also supported by a positive correlation between the mean L2-HCA scores and L2-GCA (L2-HCAp: r = .80, [.70, .86]; L2-HCAm: r = .79, [.69, .86]), indicating that participants

with higher L2 communication anxiety in the healthcare context also had higher general L2 communication anxiety.

Measurement invariance of the L1 and L2 versions of the HCA scale was assessed via invariance testing using the `lavaan` package in R and following the procedure recommended by Brown (2015). These analyses were done separately for the physical health context scales and the mental/emotional health context scales. Configural and weak invariance was established for the physical health context scale (see Appendix D), as indicated by the less than .010 decrease in Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) and less than .015 decrease in Root Mean Square Error of Approximation (RMSEA) between the fit of the configural model and the weak model (Putnick & Bornstein, 2016). The fit of the configural and weak models was adequate to good, as indicated by the CFI and TLI larger than .950 (Hu & Bentler, 1999) and the RMSEA smaller than .080 (Browne & Cudeck, 1993). This supports the fact that the HCA scale has a one-factor structure and similar indicator loadings of the four items onto the latent factor when administered for the L1 and the L2 physical health contexts. Strong invariance was not established, meaning that the HCA items do not have equivalent intercepts when applied to the L1 and L2 physical health contexts. This is expected because the L1 and L2 HCA scales do not measure the same construct since the context in which we are measuring HCA is different. We hypothesize that L2 HCA is different from L1 HCA, and as such we would expect the L1 HCA intercepts to be lower than the L2 HCA intercepts simply because participants are likely to report less anxiety when thinking about communicating in their L1 than in their L2. This is in fact what we observed in our data (the average value of the intercept for L1-HCAp is 1.470 whereas it is 3.656 for L2-HCAp). Similar findings were reported in a previous study using the L1 and L2 versions of the HCA scale in a sample of Anglophone participants from Quebec, Canada (Zhao

et al., in press). Establishing configural and weak invariance allows us to compare the variance-covariance matrices of the L1- and L2-HCAp scales (Putnick & Bornstein, 2016).

Configural invariance was supported between the L1- and L2-HCAm scales by the CFI and the TLI (see Appendix D), which were larger than .900, indicating an adequate fit. The RMSEA was well above the recommended cut-off of .080. Weak invariance was also supported for this model, although the TLI dropped slightly below acceptable levels (TLI = .897), meaning that both the TLI and the RMSEA now indicated that the model was not a good fit for our data. Strong invariance was not supported for this model. Marsh, Hau, and Wen (2004) suggest that when models are tested on smaller sample sizes, TLI and RMSEA tend to reject these models more frequently, even if they are acceptable. Similar results were found by Taasoobshirazi and Wang (2016), who additionally reported that incorrect rejection was increasingly likely the lower the degrees of freedom of the model. In Taasoobshirazi and Wang's study, false rejection rates were especially high for the RMSEA (e.g. 21.00% for a sample size of 100 and a model with 10 degrees of freedom). It is possible that our model is being wrongly rejected by the RMSEA because of a relatively small sample size and small degrees of freedom. However, running a confirmatory factor analysis (CFA) on L1-HCAm and L2-HCAm results separately we also saw that the misfit in our invariance test was mostly coming from the L1-HCAm data (CFA for L1-HCAm: CFI = .947, TLI = .842, and RMSEA = .219 90%CI[.098, .362]; CFA for L2-HCAm: CFI = .981, TLI = .944, RMSEA = .191 [.068, .337]). Upon examining the data, we found large variability in participants' responses to the L1-HCAm questions: while most participants indicated that they would feel little or no anxiety (a 1 or a 2 out of 7 on our scale) if they had to use their L1 in the mental/emotional healthcare context, there was, nevertheless, a considerable number of participants who indicated that they would be very anxious if they had to do this (a 6

or a 7 out of 7). These discrepancies in participants' responses might be indicative of a general reluctance to use mental/emotional health services among a significant portion of the sample and might be the source of the misfit we saw for the L1-HCAm scale. This is consistent with reports of a reluctance to use mental health services in Russia, where mental illness is stigmatized and believed to yield to an array of undesirable outcomes such as crime and unfitness to participate in society (e.g. ability to serve in the military) (Shek, Pietilä, Graeser, & Aarva, 2010). Because we controlled for L1-HCAm in our subsequent analyses, we do not expect this variability in participants' general reluctance to use mental healthcare to affect our results.

Anxiety-uncertainty management (AUM) questionnaire. The AUM questionnaire was a 16-item measure that assesses the Predictive Certainty and Predicted Outcome associated with the quality of healthcare services and the rapport established with a health practitioner, the participant's ability to find information, and their ability to communicate within the healthcare context (see Appendix C). Predictive Certainty (prCER) is defined as the participant's confidence in their *ability to predict* the above-mentioned aspects of the communication-based outcomes in the healthcare context (i.e., do they believe they will be able to predict how things are going, regardless of whether they are going well or poorly). Predicted Outcome (prOUT) is the *actual outcome* expected (i.e., prediction that things will actually go well or poorly).

Predictive Certainty (prCER). The prCER questions (8 out of the 16 items) in the AUM questionnaire were based on the first item of Clatterbuck's (1979b) Attributional Confidence Scale, which assesses the confidence participants have in their ability to predict how their interlocutor will behave. We adapted Clatterbuck's item to reflect the different domains in a healthcare context in which Predictive Certainty would be relevant. These included (1) the participants confidence in their ability to predict the quality of rapport they will have with a

health professional, (2) the ease with which this rapport will be established, (3) their ability to find information, complete necessary paper work, and communicate with non-medical personnel, (4) the quality of the services available, (5) the range of connections to specialists and other health care resources, the consequences of miscommunication, (6) the consequences of miscommunication, (7) the general impression health professionals will have of them, and (8) the quality of treatment they will receive. All items in the prCER scale of the AUM questionnaire were positively worded, such that participants had to agree or disagree with the statement that they are "extremely confident in their ability to predict" the above-mentioned outcomes. Participants had to indicate how much they agreed with this statement on a scale from 1 (Strongly disagree) to 7 (Strongly agree). The reliability of the prCER scale was very good for all contexts (L1 Predictive Certainty for physical health services (L1-prCERp): Cronbach's α = .86, 95%CI[.81, .90]; L2 Predictive Certainty for physical health services (L2-prCERp): α = .92, [.89, .94]; L1 Predictive Certainty for mental/emotional health services (L1-prCERm): α = .93, [.91, .95]; L2 Predictive Certainty for mental/emotional health services (L2-prCERm): α = .91, [.88, .94]).

The structural equivalence between the L1 and L2 versions of the prCER scale was also assessed. The configural invariance between the L1 and the L2 versions of the prCERp model was not supported (see Appendix D) as the fit for the model was below acceptable cut-offs for all fit indicators. A Confirmatory Factor Analysis (CFA) was performed to assess whether a one-factor model is an adequate fit for the L1 and the L2 prCERp questionnaire. The fit of the model was adequate for the L2 version of the questionnaire ($\chi^2_{df=20}$ = 32.954; CFI = .952; TLI = .933; RMSEA = .099, 90%CI[.028, .158]) but not the L1 version ($\chi^2_{df=20}$ = 58.868; CFI = .801; TLI = .721; RMSEA = .166, [.118, .216]). An Exploratory Factor Analysis (EFA) was performed to

assess the optimal number of factors for the L1-prCERp questionnaire. The parallel analysis indicated that the scale has a three-factor structure with items 1, 2, 4, 5, and 8 loading onto the first factor, items 6 and 7 loading onto the second factor, and item 3 loading on its own separate factor. As such, invariance testing is not appropriate for the prCERp scale because the L1 version of the scale does not have the same factor structure as the L2 version.

Measurement invariance was not supported for the prCERm scale. The fit of the configural model was low (see Appendix D) and as such no further model was assessed. CFAs confirmed that both the L1 and the L2 versions of the scale demonstrated one-factor structures, with relatively good fit (L1-prCERm: $\chi^2_{df=20}$ = 47.098; CFI = .923; TLI = .892; RMSEA = .140, 90%CI[.088, .192]; L2-prCERm: $\chi^2_{df=20}$ = 29.132; CFI = .967; TLI = .967; RMSEA = .082, [.000, .143]), although an acceptable fit for the L1 version was only supported by the CFI. Upon examination of the standardized residuals for the uni-factorial configural model, we determined that a lot of the covariance for items L2-prCERm02 and L2-prCERm03 was not accounted for by the model (the residuals of L2-prCERm02 were consistently underestimated and those of L2-prCERm03 were consistently overestimated). As such, it seems that the tested configural model does not properly account for these items' covariance with the other items in the scale, leading to poor fit when the L1 and the L2 scales are combined in one analysis. This might have implications on the way L2-prCERm02 loads onto the models we test as part of our hypotheses, with L2-prCERm02 potentially not being a significant indicator for the L2-prCERm latent variable.

Predicted Outcome (prOUT). The prOUT scale consisted of 8 items assessing the actual predicted outcomes for each of the variables measured in the prCER scale (quality and ease of rapport, quality of services, etc.). Each prOUT item directly followed the relevant prCER item

(see Appendix C). For example, participants first rated their predictive certainty regarding a given outcome, and then indicated how good the outcome is actually likely to be. Items 1 to 5 and item 7 were positively worded such that participants had to indicate their agreement with the statement that the outcome will actually be extremely good. Items 6 and 8 were negatively worded such that participants had to indicate their agreement with the statement that the outcome will actually be extremely bad. The reliability was good for the prOUT scale, although slightly lower than for the prCER scale (L1 Predicted Outcome for physical health services (L1-prOUTp): Cronbach's α = .82, 95%CI[.76, .87]; L2 Predicted Outcome for physical health services (L2-prOUTp): α = .86, [.82, .90]; L Predicted Outcome for mental/emotional health services (L1-prOUm): α = .85, [.81, .90]; L2 Predicted Outcome for mental/emotional health services (L2-prOUTm): α = .89, [.86, .93]). It is possible that reliability is lower for the prOUT scale because the outcomes being measured were quite varied (e.g. quality of treatment, rapport, extent of the clinician's contacts with other health professionals, etc.). As such, participants might have divergent predictions about the different outcomes being measured, leading to lower reliability. In contrast, the prCER scale measures the participants' certainty in their own ability to predict outcomes, which is likely to be more constant across outcomes.

Measurement invariance of the L1 and L2 versions of the prOUT scale was also assessed. Separate tests were performed for the physical health services and the mental/emotional health services versions of the scale. Configural invariance and partial weak invariance were supported for the PH Predicted Outcome scale (see Appendix D). Weak invariance for the prOUTp scale is partial because three items (prOUTp03, prOUTp04, and prOUTp05) were found to have significantly different loadings onto the latent variable in the L1 and the L2 scales, and as such caused a substantial drop in fit when loadings were restricted to equality for the weak model. The

said items were identified using modification indices and were progressively let free to vary while the change in the fit of the model was observed. Freeing these items resulted in a fit that was equivalent to that of the configural model. Strong invariance was not supported as indicated by the significant drop in fit between the partial week and the strong models (ΔCFI and or ΔTLI $\geq$ .010 and ΔRMSEA $\geq$ .015). The reason for this drop in fit is the same as the one observed for the HCAm scale: the intercepts for the L2 version of the scale were, on average, lower than the intercepts for the L1 version, indicating that participants thought that the outcomes in the L2 context were likely to be less good than in the L1 context.

For the prOUTm scale configural and weak invariance was supported (see Appendix D). Similarly to the PH Predicted Outcome scale, strong invariance was not supported as indicated by a significant drop in fit between the weak and the strong. Again, significantly higher intercepts for the L1 version as compared to the L2 version of the scale were the reason behind this non-invariance in the scale's intercepts.

Willingness to use healthcare services. The willingness of participants to use L1 and L2 physical and mental/emotional healthcare services was measured with a single item 7-point Likert-type scale: "If I had to seek healthcare services to address problems with my [physical health/emotional health], I would be willing to receive them in [Russian/French or English]" with the scale ranging from "1" ("Strongly disagree") to "7" ("Strongly agree").

Social network questionnaire. The social network questionnaire was designed to assess five characteristics of participants' social networks: size, density, interconnectedness, intimacy, and ethnolinguistic diversity. The social network questionnaire was based on a questionnaire previously developed by our research team (Doucerain et al., 2015). The questionnaire assesses the egocentric social network of participants, that is, where the ties between the members of the

participant's social network are the focus of the analysis. The questionnaire provides opportunity to list up to 20 acquaintances (excluding family members) with whom one interacts most often. The questionnaire then provides opportunity to pick up to 10 acquaintances from the ones previously listed with whom one feels most close to. Next, there is place to indicate the gender of these close acquaintances, one's relationship to them (e.g., friend, workmate), and the cultural community that each acquaintance belongs to. There is also a 7-point Likert-type scale regarding how close one feels to these acquaintances ("1" being "Very distant" and "7" being "Very close"). The questionnaire also elicits information from participants about which acquaintances knew each other and how often the participant observed each of these pairs of acquaintances interacting (i.e., less than once a month; a few times per month; about once a week; many times per week).

 Demographics of participants' social networks. The mean size of participants' social networks, based on all the alters that participants nominated, was 5.73 members ($SD = 3.52$) with a range of 1 to 12 members (participants had been asked to narrow their nomination of alters to ten, but two participants nevertheless nominated 12.) Participants reported that their social networks were composed on average of 3.38 females ($SD = 2.29$) with the minimum being 0 and the maximum 9 females. The average number of males in participants' social networks was 2.34 ($SD = 2.17$), with a minimum of 0 and a maximum of 9 males. An average of 3.54 ($SD = 2.86$) of the social network members were friends of the participants, with a range from 0 to 12. The mean number of social network members who were co-workers was 1.18 ($SD = 1.97$), ranging from 0 to 10, whereas the mean number of social network members who were participants'' clients was 0.11 ($SD = 0.51$), ranging from a minimum of 0 to a maximum of 3. On average, 0.24 of the members of participants' social networks were their bosses ($SD = 0.63$), with a range from

0 to 3. The average number of social network members who were professors was 0.16 (SD = 0.61), ranging from a minimum of 0 to a maximum of 4. The mean number of community members (excluding those previously described) who were part of participants' social networks was 0.27 (SD = 0.71) with a range of 0 to 4. Finally, participants indicated that an average of 0.21 (SD = 0.76) of the members of their network had another relationship with them (e.g. neighbour, their child's teacher, etc.), with a minimum of 0 and a maximum of 5.

Regarding the general characteristics of the social networks, the mean density of participants' social networks was 0.42 (SD = 0.34) with a minimum of 0.00 and a maximum of 1.00. The mean inclusiveness of their social networks was 4.73 (SD = 3.62) with a range from 0 to 10. The average number of triads (defined as the participant observing two of the members of their social networks interact less than once a month, once a month, once a week, or a few times a week) was 8.95 (SD = 10.52) with a minimum of 0.00 and a maximum of 45.00. The mean ethnolinguistic diversity of the members of participants' social networks (i.e., the number of different ethnolinguistic communities the participants identified the members of their social networks as belonging to) was 2.40 (SD = 1.14), with a minimum of 1 and a maximum of 6 different communities. Finally, the average closeness rating participants assigned to their relationships with the members in their social networks was 5.08 (SD = 1.06), with the minimum mean closeness being 2.80 and the maximum being 7.00.

Participants' L1 social networks consisted of members belonging to the Russian, Rumanian, Tatar, Ukrainian, Bulgarian, Moldovan, and Jewish ethnolinguistic communities. When only members of participants' L1 social networks were considered, the size of participants L1 social networks was on average 2.80 members (SD = 2.67), with a range from 0 to 10. L1 social networks were, on average, composed of 1.76 females (SD = 1.75) with a minimum of 0

and a maximum of 8, and 1.04 males ($SD = 1.44$), with a minimum of 0 and a maximum of 5. On average, 2.14 ($SD = 2.33$) of the L1 social network members were participants' friends, ranging from 0 to 9. The average number of L1 social network members who were participants' coworkers was 0.26 ($SD = 0.68$), ranging from 0 to 3, while none of participants' L1 social network members were their bosses. The average number of L1 social network members who were participants' professors was 0.02 ($SD = 0.15$) with a minimum of 0 and a maximum of 1. An average of 0.09 ($SD = 0.37$) of participants' L1 social network members were acquaintances from their communities (excluding the types of relationships previously described), with a minimum of 0 and a maximum of 2. The average number of L1 social network members who were participants' clients was 0.09 ($SD = 0.45$), ranging from 0 to 3. Finally, on average, participants indicated that 0.14 ($SD = 0.56$) of the members of their L1 social network had another kind of relationship with them, with the minimum number of members being 0 and the maximum 4.

Regarding the general characteristics of the L1 portions of the social networks, the average density was 0.30 ($SD = 0.38$) ranging from 0.00 to 1.00. The average inclusiveness of participants' L1 networks was 2.07 ($SD = 2.76$), ranging from 0.00 to 9.00. The mean number of triads within participants' L1 social networks was 3.06 ($SD = 5.95$), ranging from 0 to 28. The mean ethnolinguistic diversity that the members of participants' L1 social networks identify with was 1.02 ($SD = 0.60$), ranging from 1 to 3. Finally, the average closeness rating participants assigned to their relationships with members of their L1 social networks was 4.68 ($SD = 2.18$), with the minimum rating being 1.00 and the maximum 7.00.

Participants' L2 social networks consisted of members belonging to the Canadian-English, Canadian-French, Spanish, Arabic, Latino, Filipino, Jamaican, Iranian, Hindi, Korean,

and Chinese ethnolinguistic communities. When only members of participants' L2 social networks were considered, the size of participants L2 social networks was on average 2.92 members (SD = 2.90), with a range from 0 to 10. L2 social networks were, on average, composed of 1.61 females (SD = 1.72) with a minimum of 0 and a maximum of 7, and 1.31 males (SD = 1.82), with a minimum of 0 and a maximum of 9. On average, 1.40 (SD = 1.79) of the L2 social network members were participants' friends, ranging from 0 to 7. The average number of L2 social network members who were participants' coworkers was 0.92 (SD = 1.77), ranging from 0 to 8, while the average number of members who were their bosses was 0.20 (SD = 0.59), ranging from 0 to 3. The average number of L2 social network members who were participants' professors was 0.14 (SD = 0.60) with a minimum of 0 and a maximum of 4. An average of 0.18 (SD = 0.64) of participants' L2 social network members were acquaintances from their communities (excluding the types of relationships previously described), with a minimum of 0 and a maximum of 4. The average number of L2 social network members who were participants' clients was 0.01 (SD = 0.11), ranging from 0 to 1. Finally, on average, participants indicated that 0.07 (SD = 0.37) of the members of their L2 social network had another kind of relationship with them, with the minimum number of members being 0 and the maximum 3.

Regarding the general characteristics of the L2 portions of the social networks, the average density was 0.30 (SD = 0.39) ranging from 0.00 to 1.00. The average inclusiveness of participants' L2 networks was 2.12 (SD = 2.89), ranging from 0.00 to 9.00. The mean number of triads within participants' L2 social networks was 3.68 (SD = 7.56), ranging from 0 to 36. The mean ethnolinguistic diversity that the members of participants' L2 social networks identify with was 1.38 (SD = 1.05), ranging from 1 to 5. Finally, the average closeness rating participants

assigned to their relationships with members of their L2 social networks was 3.90 ($SD = 2.33$), with the minimum rating being 1.00 and the maximum 7.00.

Other measures. A number of additional single-item measures were also included into the questionnaire. These items measured (a) the approximate number of times participants have used L1 and L2 physical and mental/emotional health services in the last 6 months (ranging from "Never" to "16 times or more"; (b) the participants' satisfaction with the L1 and L2 physical and mental health services; (c) the accessibility of L1 and L2 physical and mental health services; (d) and the participant's preferred language (L1 or L2 and French or English) for receiving physical and mental health services.

Results

Data cleaning and preparation was done using R version 3.5.2 and all results were obtained using the `lavaan` package in R. All confidence intervals were obtained via bootstrapping with 1000 iterations. Data was first prepared for analyses by removing all incomplete responses and participants who did not consent to participate in the study. Participants were selected only if their first or dominant language was Russian and if they correctly answered the honesty question. Reverse scored items were reversed for all scales.

Scale scores were then prepared to make them L2- and mental health-specific to test our hypotheses. Aggregate scores were calculated for the L2 general communication anxiety (L2-GCA) scale by obtaining the mean score on the scale for each participant. To obtain the L2- and mental/emotional health-specific scores for the health communication anxiety scale (HCA_{2m}), the predictive certainty scale ($prCER_{2m}$) and the predicted outcome scale ($prOUT_{2m}$) we first residualized the raw L2-HCAm, L2-prCERm, and L2-prOUTm scores against their L1 equivalents (L1-HCAm, L1-prCERm and L1-prOUTm). As we also wanted to control for

additional factors that might account for participants' unwillingness to use L2 mental/emotional health services, we residualized the obtained L2-HCAm, L2-prCERm, and L2-prOUTm scores obtained in the previous step against participants' L2 speaking ability scores, their L2-GCA scores, and the frequency with which they have used L1 and L2 mental/emotional health services in the past 12 months. To obtain mental/emotional health-specific scores we further residualized these scores against their physical health equivalents (L2-HCAp, L2-prCERp and L2-prOUTp) which had themselves been residualized beforehand against their L1 equivalents (L1-HCAp, L1-prCERp and L1-prOUTp), L2 speaking ability, L2-GCA scores, and the frequency with which participants had used physical health services in the past 12 months. These final HCA_{2m}, $prCER_{2m}$, and $prOUT_{2m}$ scores were standardized before being used in the following analyses.

Relationship Between HCA_{2m} And the Willingness to Use L2 Mental/Emotional Health Services

Our first hypothesis was that HCA_{2m} will be negatively associated with participants' willingness to use L2 mental/emotional healthcare services. To test this hypothesis, we ran a regression analysis where participants' scores on the item measuring the willingness to use L2 mental/emotional health services were regressed on the HCA_{2m} latent variable (see Figure 1 in Appendix E). A significant negative association was found between HCA_{2m} and the willingness to use L2 mental/emotional health services (see Figure 1 in Appendix E), such that as HCA_{2m} increases, the willingness to use L2 mental/emotional health services decreases. This confirmed our first hypothesis: as HCA_{2m} increases, the willingness to use L2 mental/emotional health services decreases. In other words, the greater participants' anxiety about using their L2 in a mental/emotional healthcare setting, the less willing they are to seek these services.

Mediation by $prCER_{2m}$ and $prOUT_{2m}$

Given that a relationship was established between HCA_{2m} and the willingness to use L2 mental/emotional healthcare services, we wanted to understand what might explain the link between these two variables. That is, we wanted to understand what might mediate this relationship. Our second hypothesis was that the relationship between HCA_{2m} and the willingness to use L2 mental/emotional health services would be mediated by $prCER_{2m}$ and $prOUT_{2m}$. We hypothesized that as HCA_{2m} increases, decreases in $prCER_{2m}$ and $prOUT_{2m}$ will be associated with a decrease in the willingness to use L2 mental/emotional healthcare services.

Then, to test this hypothesis we ran a latent variable analysis for a mediation model with two mediators (see Figure 2 in Appendix E for a simplified schematic of this model, where item disturbances are omitted from the model). The analysis revealed that the relationship between HCA_{2m} was entirely mediated by $prCER_{2m}$, whereas $prOUT_{2m}$ was not a significant mediator as it was not associated with the willingness to use L2 mental/emotional health services (see Figure 3 in Appendix E). In this analysis, the direct relationship between HCA_{2m} and willingness was no longer significant. As such, our analysis demonstrated that the relationship between HCA_{2m} and the willingness to use L2 mental/emotional health services from our first hypothesis can be fully explained by a mediation through $prCER_{2m}$. This partially supports our second hypothesis: as HCA_{2m} increases, $prCER_{2m}$ decreases, which is in turn associated with a decrease in the willingness to use L2 mental/emotional health services. Inconsistent with our second hypothesis is the fact that $prOUT_{2m}$ does not play any role in the relationship between HCA_{2m} and willingness to use L2 mental/emotional healthcare: although HCA_{2m} and $prCER_{2m}$ are both significantly associated with $prOUT_{2m}$, $prOUT_{2m}$ is not significantly related to willingness. Therefore, the results of this mediation analysis demonstrate that increased anxiety about using an L2 in the mental/emotional healthcare context is associated to a decreased predictive certainty

(i.e. how confident they are that they will be able to predict how easily and quickly rapport will be established, the quality of care and communication within the healthcare setting, the quality of the contacts the health practitioner has with other practitioners, as well as the possible consequences of miscommunication) which is associated to a decreased willingness to use L2 mental/emotional healthcare services.

The Role of Social Network Characteristics

As we established that $prCER_{2m}$ mediated the relationship between HCA_{2m} and the willingness to use L2 mental/emotional healthcare services, we wanted to understand what factors might affect $prCER_{2m}$, independently of the mediation model. More specifically, we wanted to investigate how participants' social network characteristics (social network size, interconnectedness, density, the number of triads in the social network, the psycholinguistic diversity of the members of the network, and the closeness between the participants and the members of their social networks) would affect $prCER_{2m}$. Additionally, we wanted to compare the effect of L1 versus L2 social network characteristics $prCER_{2m}$. Therefore, our third hypothesis was that social network characteristics would be associated with $prCER_{2m}$ such that networks that are larger, more interconnected and dense, have more triads, and are more diverse with higher levels of closeness would be associated with higher $prCER_{2m}$. Furthermore, we hypothesized that these associations will only be true for the characteristics of participants' L2 social networks and not the characteristics of their L1 social networks.

To test these hypotheses, we ran two independent regression analyses. The first analysis used L1 social network characteristics as predictors. The second analysis used L2 social network characteristics as predictors. All predictor social network characteristics were entered simultaneously into each analysis. Similarly to our previous analyses, $prCER_{2m}$ was

operationalized as a latent variable (see Figures 4 and 5 in Appendix E). In addition to the residualization and standardization of the $prCER_{2m}$ variable as described previously, we also standardized the social network characteristics variables prior to each analysis.

Our analyses showed that none of the L1 or L2 social network characteristics were significantly related to $prCER_{2m}$ (see Figures 4 and 5 in Appendix E). Although some regression coefficients were substantial, confidence intervals indicated that none of them reached significance.

Overall, the results failed to support our third hypothesis as they seem to indicate that none of the L2 social network characteristics are associated with $prCER_{2m}$.

Discussion

This project explored the relationship between second language- and mental health-specific health communication anxiety (HCA_{2m}) and the willingness to use second language (L2) mental healthcare services among Russian-speaking immigrants in Canada. Our first objective was to establish whether an association exists between HCA_{2m} and immigrants' willingness to utilize L2 mental healthcare services. If a link was established, then our second objective was to explore the role of immigrants' confidence in their ability to predict how communication and treatment will unfold within the L2 mental healthcare context (their predictive certainty, $prCER_{2m}$) and their actual predicted outcomes of communication and treatment in the L2 context (their predicted outcomes, $prOUT_{2m}$). If one or both of these factors were found to underlie the relationship between HCA_{2m} and immigrants' willingness to use L2 mental healthcare services, then our third objective was to explore the role of immigrants' social networks in modulating their predictive certainty and/or their predicted outcomes about L2 mental healthcare services.

In line with our first hypothesis, the results of this project indicated that Russian-speaking immigrants' HCA_{2m} was in fact negatively associated with their willingness to use L2 mental healthcare services: Immigrants with higher anxiety about communicating in their L2 in a mental healthcare context were less willing to use L2 mental healthcare services were available to them. Our results are consistent with those obtained by Zhao et al. (in press) who observed a similar relationship between HCA_{2m} and HCA_{2p} (a physical healthcare-specific version of HCA_2) and Quebec Anglophones' willingness to use Francophone mental and physical healthcare services. These findings highlight the importance of HCA_{2m} as a language barrier to mental healthcare access among immigrants that is distinct from the general form of L2 communication anxiety (Guntzviller, Yale, & Jensen, 2016) and the general form of health communication anxiety (Booth-Butterfield et al., 1997). Our results also underscore the importance of developing tools and approaches to immigrant healthcare that minimize the impact of HCA_{2m} on mental healthcare access and use among this vulnerable part of the population, especially since immigrants are known to underuse mental healthcare services (Abe-Kim et al., 2007; Abebe, Lien, Elstad, Abebe, & Elstad, 2017; Durbin, Lin, Moineddin, Steele, & Glazier, 2014; Islam, Macpherson, Tamim, & Khanlou, 2018). Ensuring that HCA_{2m} is addressed is especially crucial in the case of Russian-speaking immigrants as this group is known to face multiple barriers in addition to language barriers that lead them to delay and even altogether avoid seeking mental healthcare. These include beliefs that mild mental illness such as depression and anxiety is normal and will disappear by itself (Leipzig, 2006; Shek et al., 2010), lack of mental health literacy (Leipzig, 2006), fear of stigma from the Russian-speaking community (Drob et al., 2016; Hundley & Lambie, 2007; Jurcik et al., 2013; Leipzig, 2006; Shek et al., 2010), distrust of

mental healthcare and social services (Leipzig, 2006) and skepticism about mental health professionals' capacity to be helpful (Drob et al., 2016).

In addition, our results indicated that the relationship between HCA_{2m} and immigrants' willingness to use L2 mental healthcare services was completely mediated by $prCER_{2m}$. Our results indicated that higher HCA_{2m} was associated with lower $prCER_{2m}$, which was in turn associated with a reduced willingness to use L2 mental healthcare services. After $prCER_{2m}$ was included as a mediator, the direct relationship between HCA_{2m} and willingness became insignificant, which indicated a full mediation by $prCER_{2m}$. This was partially in line with our second hypothesis. Although $prOUT_{2m}$ was negatively associated to HCA_{2m}, it was not associated to immigrants' willingness to use L2 mental healthcare services. Furthermore, $prCER_{2m}$ and $prOUT_{2m}$ were positively related in our sample, indicating that higher confidence in one's ability to predict how communication and treatment will unfold within the L2 mental healthcare context is associated with better predicted outcomes of communication and treatment. Despite this association, our results indicate that it is immigrants' lack of confidence in their ability to predict the quality of communication and treatment in an L2 mental healthcare setting, and not the fact that they predict that these outcomes would be negative, that explains the influence HCA_{2m}, a second language- and mental health-specific form of health communication anxiety, has on immigrants' unwillingness to use L2 mental healthcare services. Therefore, it seems that HCA_{2m} mostly decreases immigrants' willingness to use L2 mental healthcare because it decreases their confidence in being able to predict how encounters in the mental healthcare context will unfold, and not because they think that these encounters will necessarily go wrong. This finding has important implications for interventions aiming to increase mental healthcare use in immigrant populations. Future interventions should aim to reduce immigrants'

uncertainty about what it is like to seek and receive mental healthcare services. According to Clatterbuck (1979a, p. 148), communicative uncertainty can be reduced by "the provision of information which is perceived as adequate for the making of the necessary decisions within the interaction". Uncertainty in the mental healthcare context can therefore potentially be reduced through interventions aiming to inform immigrants about what mental healthcare services are like and how treatment unfolds, as this type of information can be useful in reducing uncertainty when immigrants consider communicating with a mental healthcare professional. Interventions aimed at decreasing immigrant's uncertainty during conversations with mental health professionals will also be of outmost importance. For example, future interventions might include information about specific mental illnesses and their treatments and the associated vocabulary. However, it will first be primordial to first research the type of information that is perceived as adequate by different immigrant groups.

Finally, the results of this project did not support the hypothesis that the characteristics of immigrants' social networks, be it their L1 or their L2 social networks, are associated with prCER$_{2m}$. This is inconsistent with past research, which emphasized the importance of social networks as an essential part of coping with immigration (Caidi et al., 2010; Kuo & Yung-Mei, 1986), especially in the case of Russian-speaking immigrants who use them extensively as a source of information and a way to obtain services (Jurcik et al., 2013; Ledeneva, 2008; Ritsner et al., 1997). In addition, our results are inconsistent with research showing that interconnected L2 social networks can decrease communication-related acculturative stress (Doucerain et al., 2015). A possible explanation for our inconsistent findings is that social network characteristics do not necessarily directly influence prCER$_{2m}$ but rather moderate the relationship between HCA$_{2m}$ and prCER$_{2m}$. Indeed, it is plausible that the relationship between HCA$_{2m}$ and prCER$_{2m}$

is strongest when immigrants' social networks are smaller, less dense and interconnected, less intimate, and less diverse, while it is weak when immigrants have a well-developed network on which they can rely. This would be in line with results reported by Jurcik et al. (2015), who found that, for Russian-speaking immigrants living in Montreal, perceived ethnic density (i.e. the proportion of people who are part of immigrants' respective ethnolinguistic background) moderated the relationship between acculturation and distress. The role of social network characteristics as moderators rather than predictors would therefore indicate that they are rather a context in which HCA_{2m} and $prCER_{2m}$ influence immigrants' willingness to use mental healthcare services, rather than direct predictors modulating these variables.

Limitations

To our knowledge, this project is the first to explore the relationship between HCA_{2m}, $prCER_{2m}$, $prOUT_{2m}$, social network characteristics, and immigrants' willingness to use L2 mental healthcare services. The first limitation of our study is the relatively small sample size which might have prevented us from obtaining significant results for the role of social network characteristics in our model. Furthermore, our results only apply to Russian-speaking immigrants in Canada, and might not generalize to other immigrant groups, or Russian-speaking immigrants residing in other countries. In addition, regional differences in the relationships we have uncovered might exist for Russian-speaking immigrants in different provinces and territories of Canada. Our results are also limited by the fact that participants had to imagine seeking mental and physical healthcare services in their L2 and reported on their willingness to use the services. Results might be different if immigrants' HCA_{2m}, $prCER_{2m}$, and $prOUT_{2m}$ are assessed in the context of actual healthcare-seeking behaviour. Another limitation of this project is that it is cross-sectional, and as such causality between the assessed variables cannot be inferred. Studies

employing a longitudinal design will need to be carried out in order to establish causal relationships within our model.

Conclusions

This project established the existence of a negative relationship between second language-, mental healthcare-specific health communication anxiety (HCA_{2m}) and Russian-speaking immigrants' willingness to use second-language (L2) mental healthcare services. Furthermore, this relationship was found to be mediated by immigrants' confidence in their ability to predict how L2 interactions and treatment will unfold within the L2 mental healthcare context (predictive certainty, $prCER_{2m}$). In contrast, the data did not support the idea that immigrants' predicted actual outcomes for communication and treatment in the L2 setting ($prOUT_{2m}$) played a role in explaining the relationship between HCA_{2m} and their willingness to use L2 mental healthcare services. In addition, the results of this project seem to suggest that the characteristics of immigrants' L1 and L2 social networks do not play a role in modulating $prCER_{2m}$.

These results, obtained in an immigrant sample, add to the existing findings linking HCA_2 to the willingness to use L2 healthcare services in non-immigrant samples (Zhao, 2017; Zhao et al., in press), which highlights the role of HCA_2 as a language barrier to healthcare access in these two linguistic-minority groups. This underscores the fact that HCA_2 seems to affect healthcare access regardless of the cultural background and the material, informational, and relational resources of the healthcare user. This study however also highlights some unique features of an immigrant sample as compared to a non-immigrant sample, namely the difference in the mechanism that mediates the relationship between HCA_{2m} and willingness to use L2 mental healthcare services. Indeed, $prCER_{2m}$ plays an important role in explaining this

relationship, highlighting the uncertainty immigrants face in regards to language and treatment within an L2 mental healthcare context, whereas it has not been found to play the same role in a non-immigrant sample (Zhao, 2017).

These results have important implications for future interventions targeting language barriers to immigrants' access to mental healthcare services. The findings of this research underscore the importance of considering the impact HCA_{2m} has on immigrants' willingness to use these services and suggest that $prCER_{2m}$ can be a promising target of interventions. Targeting HCA_{2m} and $prCER_{2m}$ as part of mental healthcare access campaigns can encourage immigrants to seek mental healthcare earlier. Delaying care because of HCA_{2m} and low $prCER_{2m}$ might be worsening immigrants' mental health over time. Interventions aiming to reduce HCA_{2m} and increase $prCER_{2m}$ could therefore decrease individual, family, and societal burden of mental illness by helping immigrants access care before the problem gets more severe or chronic. Future research on language barriers to mental healthcare access should aim to include HCA_{2m} as a distinct barrier that contributes to the overall underuse of mental healthcare among immigrant populations.

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Appendices

Appendix A – Second-language General Communication Anxiety (L2-GCA) Questionnaire

Please indicate below how you feel while speaking French/English in general, in everyday situations.

Choose the appropriate number on a scale from 1 to 7 (1 = strongly disagree, 7 = strongly agree) to indicate how strongly you agree with the statement about you. If you have not experienced the situation described in the statement, then try to imagine how you would feel.

1. I am socially somewhat awkward when I have to speak French/English.

2. I am generally comfortable at parties and other social functions when I am using French/English.*

3. I quickly overcome my shyness in new situations when speaking in French/English.*

4. It is easy for me to act natural when I am using French/English.*

5. I have doubts about my social competence when I use French/English.

6. I feel inhibited using French/English.

7. I find it easy to talk to strangers using French/English.*

---

* Reverse scored items. This scale is adapted from Cheek and Buss (1981).

Appendix B – Health Communication Anxiety (HCA) Questionnaire

Imagine you need to talk about emotional difficulties, using Russian/English or French to do this. Sometimes this would be with a doctor or other healthcare professional (social worker, counselor, therapist, psychologist, psychiatrist, etc.) in a medical setting (e.g., in a therapist's office, in a clinic, or a hospital). Sometimes this would be with people who are not healthcare providers. Below are statements about such situations.

In some cases, you might have already experienced the situation that is described. Please base your responses on your experience. If you have not already experienced the situation, then just imagine it.

Choose the appropriate number on a scale from 1 to 7 (1 = strongly disagree, 7 = strongly agree) to indicate how strongly you agree with the statement about you.

1. If I had to use (Russian/English or French) to talk to a health professional about emotional difficulties, I would get so nervous I would forget things I know.

2. If I had to use (Russian/English or French), I would feel my heart pounding when talking to a healthcare professional about emotional difficulties.

3. If I had to use (Russian/English or French), I would become nervous speaking in a healthcare professional's office about emotional difficulties.

4. If I had to use (Russian/English or French), I would get nervous if the doctor asked questions about emotional difficulties that I was unable to prepare for in advance.

---

*Reverse scored items. These scales are adapted from Guntzviller, Jensen, King and Davis (2011).

Appendix C – Anxiety-Uncertainty Management (AUM) Questionnaire

Please rate the following statements on a scale from 1=absolutely disagree to 7=absolutely agree:

1a. I am extremely confident in my ability to predict the quality of rapport I would have speaking with a (Russian/English or French)-speaking health professional about emotional difficulties, in terms of feeling understood, valued and supported. Think about all healthcare professionals including social workers, counselors, therapists, psychologists, psychiatrists, etc.

1b. I think the quality of the rapport would actually be extremely good in this situation.

2a. I am extremely certain that I will be able to predict how easy it would be to establish a good rapport in speaking with a (Russian/English or French) health professional about emotional difficulties, in terms of feeling understood, valued and supported. Think about all healthcare professionals including social workers, counselors, therapists, psychologists, psychiatrists, etc.

2b. I think it would actually be easy to establish a good rapport in this situation.

3a. If I had to obtain healthcare services at a (Russian/English or French)-speaking institution regarding emotional difficulties, I would be extremely confident that I would be able to predict my ability to find out information, complete the necessary paperwork, and communicate with non-medical personnel (e.g., hospital administrators, office secretaries, clerks, assistants). Think about all the institutions where you might receive services for emotional difficulties of any kind, including from social workers, counselors, therapists, psychologists, psychiatrists, etc.

3b. I think it would actually be extremely easy to do this in this situation.

4a. I am extremely confident about my ability to predict the quality of services available in (Russian/English or French) for treating or handling emotional difficulties. Think about all healthcare professionals including social workers, counselors, therapists, psychologists, psychiatrists, etc.

4b. I think the quality of services would actually be extremely good in this case.

5a. I am extremely confident about my ability to predict whether (Russian/English or French)-speaking health professionals have a wide range of connections to specialists and other health care resources for dealing with emotional difficulties. Think about all healthcare professionals including social workers, counselors, therapists, psychologists, psychiatrists, etc.

5b. I think these professionals would actually be extremely well-connected.

6a. I am extremely confident about my ability to predict the possible consequences of miscommunication with a (Russian/English or French)-speaking health professional in dealing with emotional difficulties. Think about all healthcare professionals including social workers, counselors, therapists, psychologists, psychiatrists, etc.

6b. I think the consequences of miscommunication would actually be extremely negative in this situation.*

7a. If I were to speak to a (Russian/English or French)-speaking health professional about emotional difficulties, I would be extremely confident about my ability to predict the general impression they would have of me. Think about all healthcare professionals including social workers, counselors, therapists, psychologists, psychiatrists, etc.

7b. I think that the health professional would actually have an extremely positive impression of me in this situation.

8a. I am extremely confident about my ability to predict the quality of treatment that I am likely

to receive from (Russian/English or French)-speaking health professionals for emotional

difficulties. Think about all healthcare professionals including social workers, counselors,

therapists, psychologists, psychiatrists, etc.

8b. I think that this treatment would actually be extremely poor in this situation.*

---

* Reverse scored items.

Note: Items with "a" in their numbering are predictive certainty items (prCER). Items with "b" in their numbering are predicted outcome items (prOUT).

Appendix D – Invariance Tests for HCA And AUM Questionnaires

Table 1. Invariance tests of HCA and AUM questionnaires.

Model	χ^2	$df_{\chi2}$	CFI	TLI	RMSEA	90% CI	$\Delta\chi^2$	$df_{\Delta\chi2}$
L1/L2 HCA (physical health)								
Configural	15.625	15	.998	.997	.025	[.000, .118]	-	-
Weak	16.764	18	1.000	1.000	.000	[.000, .106]	1.868	3
Strong	24.284	21	.989	.985	.051	[.000, .126]	7.032	3
L1/L2 HCA (mental/emotional health)								
Configural	36.789	15	.949	.905	.143	[.085, .202]	-	-
Weak	44.215	18	.934	.897	.148	[.093, .204]	7.408	3
Strong	55.116	21	.915	.887	.155	[.106, .206]	11.243*	3
L1/L2 Predictive certainty (physical health)								
Configural	180.045	95	.858	.820	.106	[.082, .129]	-	-
L1/L2 Predicted outcome (physical health)								
Configural	114.429	95	.957	.946	.051	[.000, .082]	-	-
Weak	145.492	102	.905	.888	.074	[.044, .099]	30.251***	7
Partial weak (prOUTp04 freed)	139.442	101	.915	.899	.070	[.038, .097]	22.171**	6
Partial weak (prOUTp04 and prOUTp05 freed)	130.063	100	.933	.920	.062	[.024, .091]	13.255 *	5
Partial weak (prOUTp04, prOUTp05, and prOUTp03 freed)	122.929	99	.947	.936	.056	[.000, .085]	7.594	4
Strong	137.803	106	.930	.921	.062	[.026, .089]	15.791*	7

	L1/L2 Predictive certainty (mental/emotional health)							
Configural	231.359	95	.841	.799	.133	[.112, .155]	-	-
	L1/L2 Predicted outcome (mental/emotional health)							
Configural	155.104	95	.923	.902	.085	[.060, .109]	-	-
Weak	167.514	102	.915	.900	.086	[.062, .109]	12.385	7
Strong	216.841	109	.858	.843	.107	[.086, .128]	47.387***	7

*$p < .05$, ** $p < .01$, *** $p < .001$

Note: CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation.
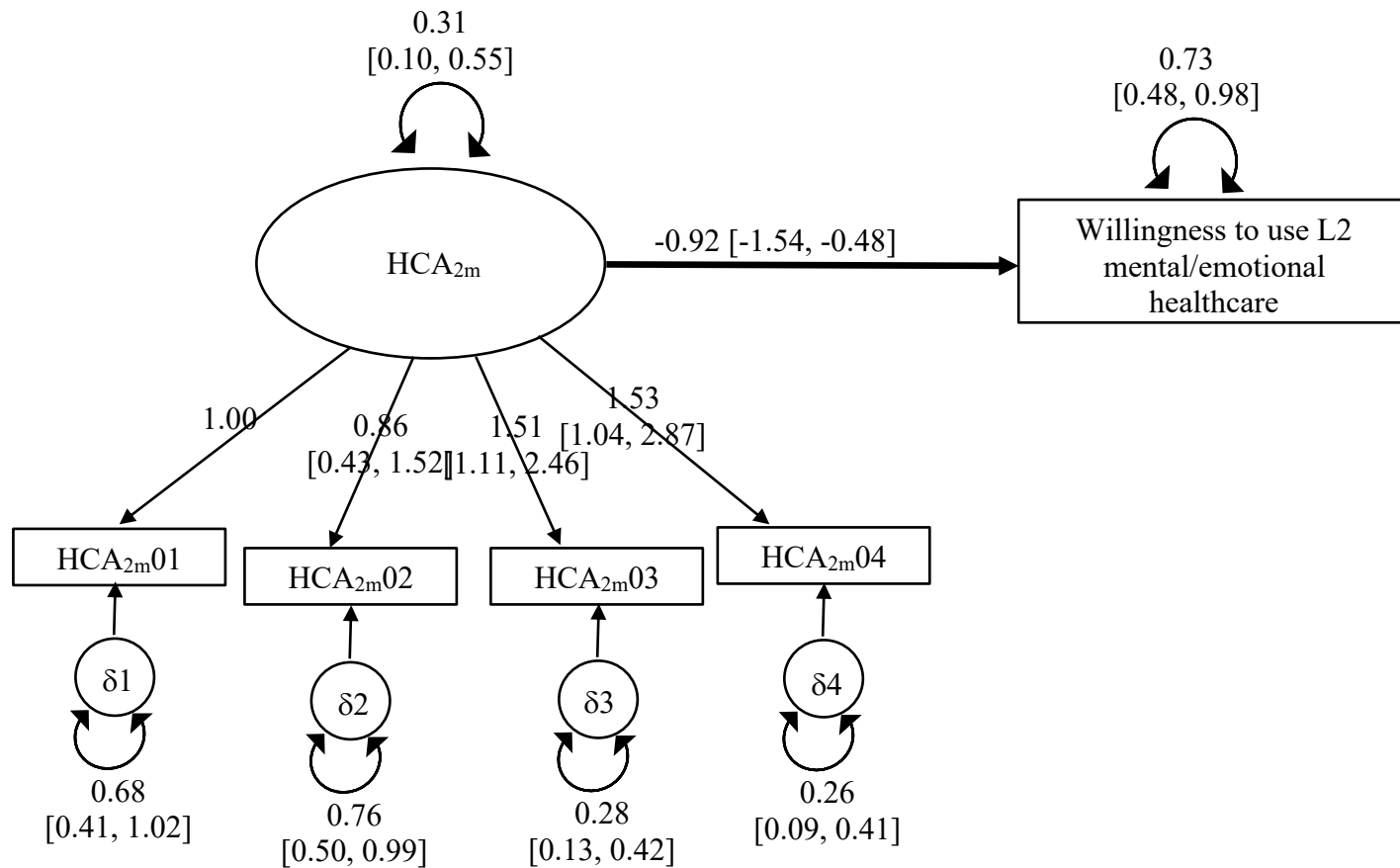
Figure 1. Relationship between second-language (L2)- and mental/emotional health-specific health communication anxiety (HCA$_{2m}$) and the willingness to use L2 mental/emotional healthcare.

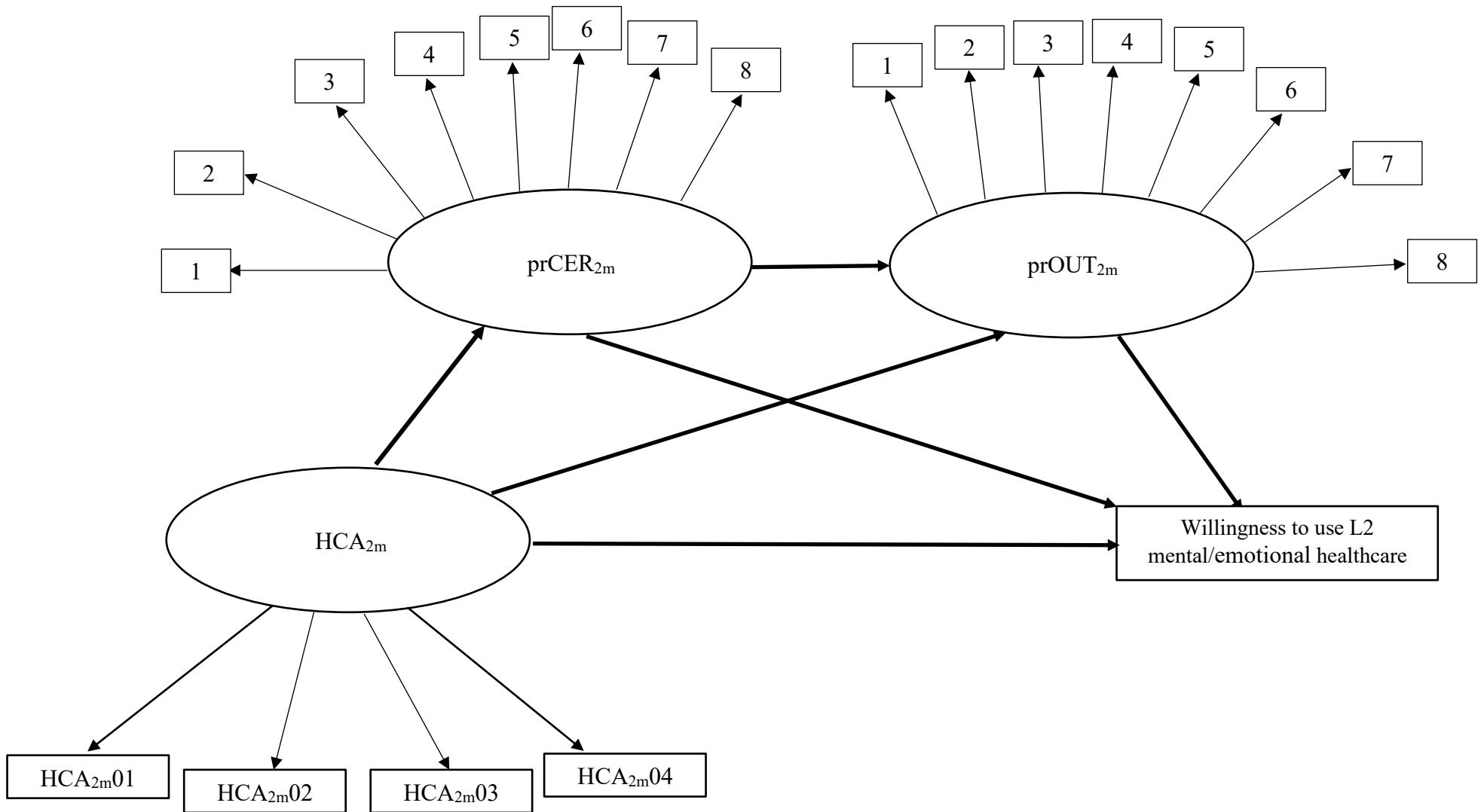*Figure 2.* Simplified schematic of the two-mediator model of the relationship between second-language (L2)- and mental/emotional health-specific health communication anxiety (HCA$_{2m}$), L2- and mental/emotional health-specific predictive certainty (prCER$_{2m}$), L2- and mental/emotional health specific predicted outcomes (prOUT$_{2m}$), and the willingness to use L2 mental/emotional healthcare services.

0.84
[0.50, 1.15]

0.56
[0.32, 0.78]

0.75
[0.47, 1.02]

0.74
[0.48, 1.00]

0.63
[0.35, 0.91]

0.82
[0.50, 1.07]

0.39
[0.10, 0.63]

0.61
[0.40, 0.86]

0.54
[0.30, 0.87]

0.52
[0.29, 0.72]

0.80
[0.45, 1.14]

0.93
[0.68, 1.15]

0.72
[0.50, 0.91]

δ7

δ8

δ9

δ10

δ11

δ12

δ13

δ14

δ15

δ16

δ17

δ18

δ19

0.96
[0.61, 1.30]

δ6

3

4

5

6

7

8

1

2

3

4

5

6

7

8

δ5

δ20

prCER$_{2m}$

prOUT$_{2m}$

0.44
[0.10, 0.89]

0.75
[0.45, 1.04]

0.55
[0.28, 0.95]

0.57
[0.21, 0.94]

0.68
[0.37, 1.02]

0.47
[0.09, 0.97]

0.18
[-0.23, 0.66]

1.00

0.44 [0.14, 0.83]

0.86
[0.45, 1.47]

0.79
[0.44, 1.20]

0.88
[0.47, 1.40]

0.56
[-0.06, 0.64]

0.32
[0.17, 1.05]

0.67
[0.27, 1.16]

0.67

1.00

-0.58
[-1.12, -0.17]

-0.59 [-1.05, -0.19]

0.32 [0.01, 0.84]

0.24
[-0.47, 0.70]

0.24
[0.06, 0.51]

0.72
[0.42, 0.98]

0.66
[0.33, 0.99]

0.22
[0.00, 0.41]

HCA$_{2m}$

Willingness to use L2
mental/emotional healthcare

-0.51 [-1.17, 0.15]

0.33
[0.12, 0.57]

1.00

0.82
[0.37, 1.44]

1.47
[1.06, 2.32]

1.50
[1.03, 2.53]

HCA$_{2m}$01

HCA$_{2m}$02

HCA$_{2m}$03

HCA$_{2m}$04

δ1

δ2

δ3

δ4

0.66
[0.39, 0.96]

0.77
[0.51, 1.04]

0.29
[0.10, 0.44]

0.26
[0.08, 0.41]

0.59
[0.37, 0.77]

L2-prCERm indirect effect: -0.19 [-0.69, -0.01]
L2-prOUTm indirect effect: -0.14 [-0.52, 0.18]
L2-prCERm/L2-prOUTm indirect effect: -0.08 [-0.39, 0.00]
Total indirect effect: -0.41 [-0.85, -0.12]
Total effect: -0.92 [-1.60, -0.41]

Figure 3. Relationship between second-language (L2)- and mental/emotional health-specific health communication anxiety (HCA$_{2m}$), L2- and mental/emotional health-specific predictive certainty (prCER$_{2m}$), L2- and mental/emotional health specific predicted outcomes (prOUT$_{2m}$), and the willingness to use L2 mental/emotional healthcare services.
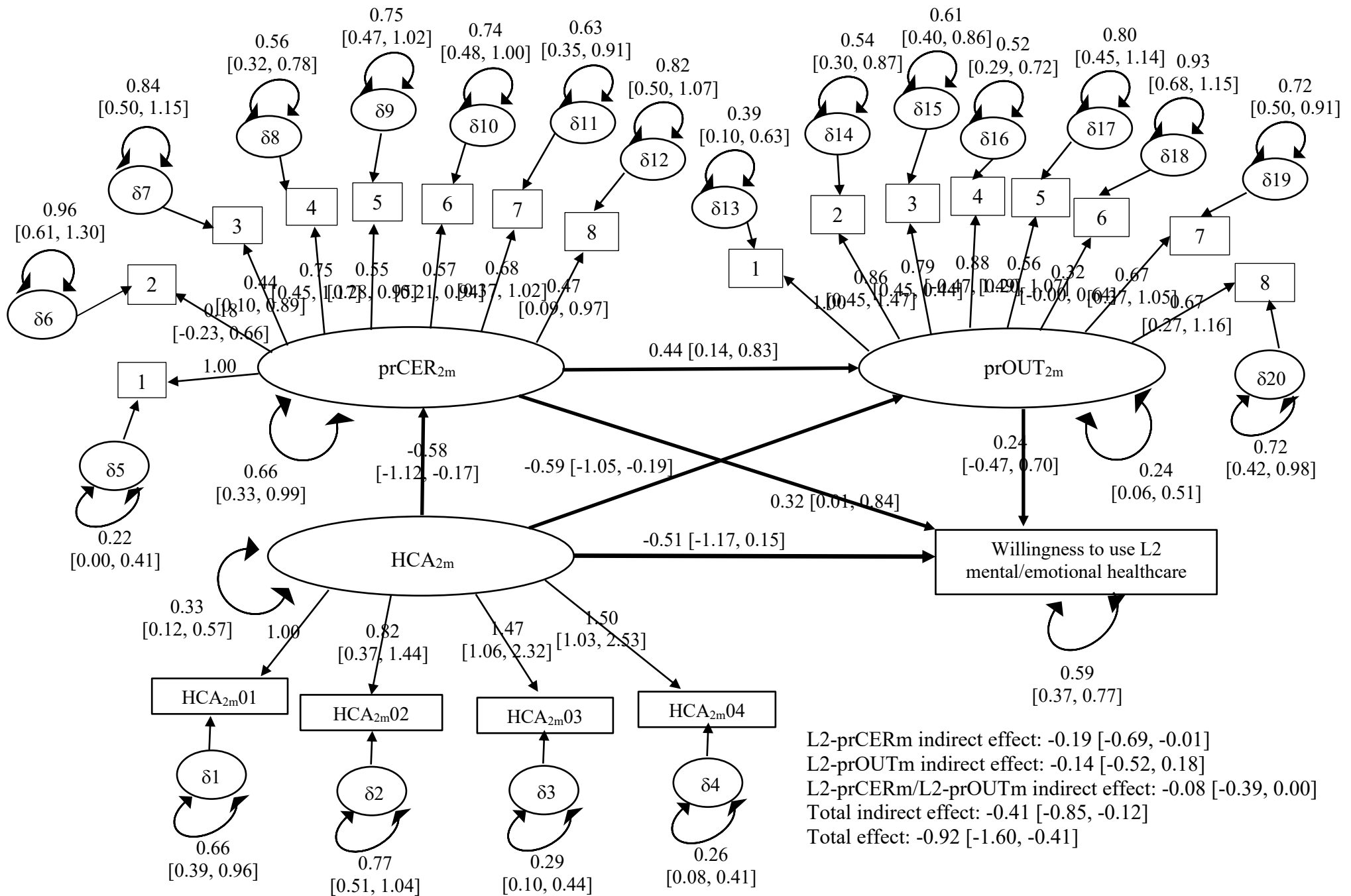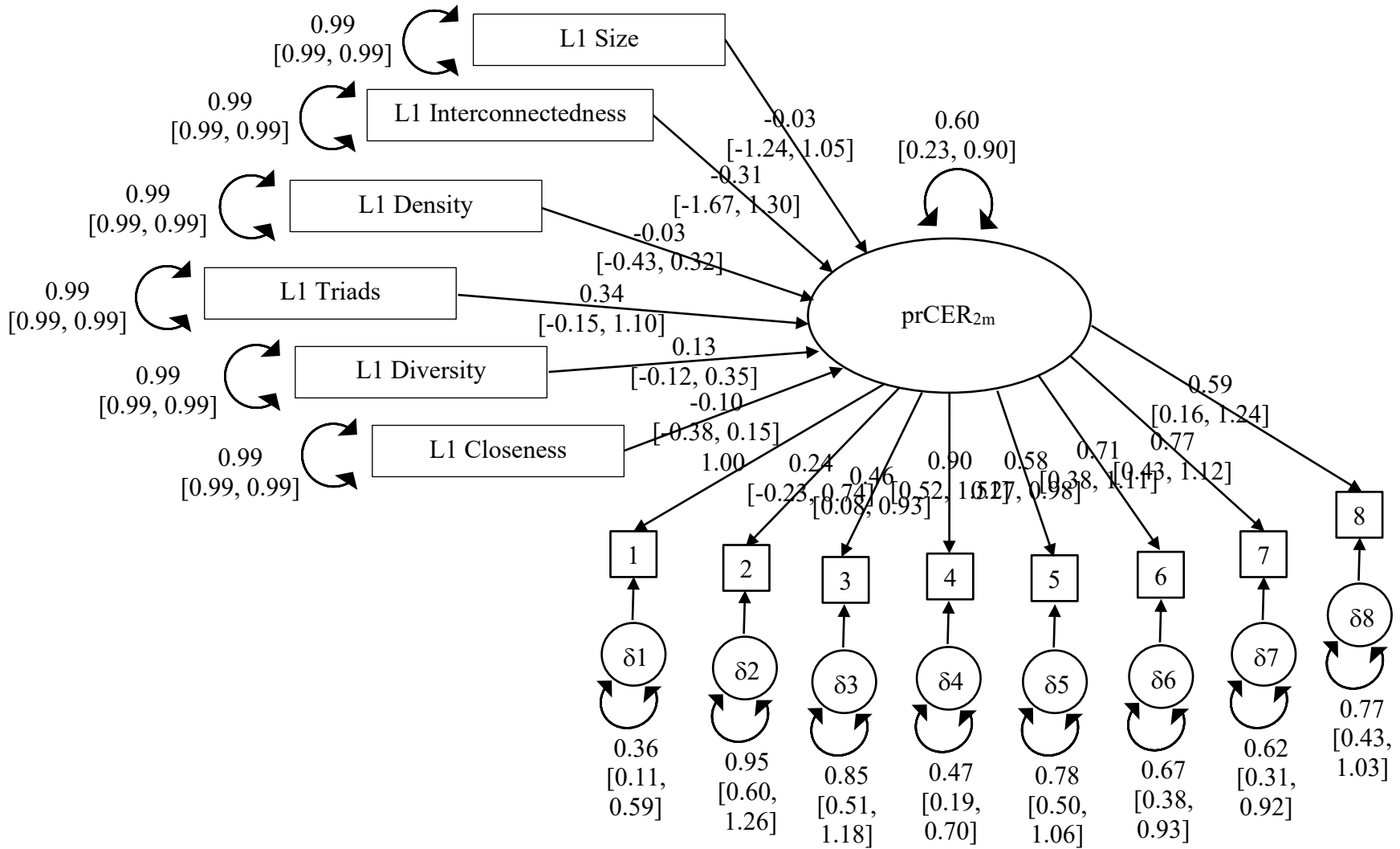
66

Figure 4. Relationship between first-language (L1) social network characteristics and second-language (L2)- and mental/emotional health-specific predictive certainty (prCER2m).
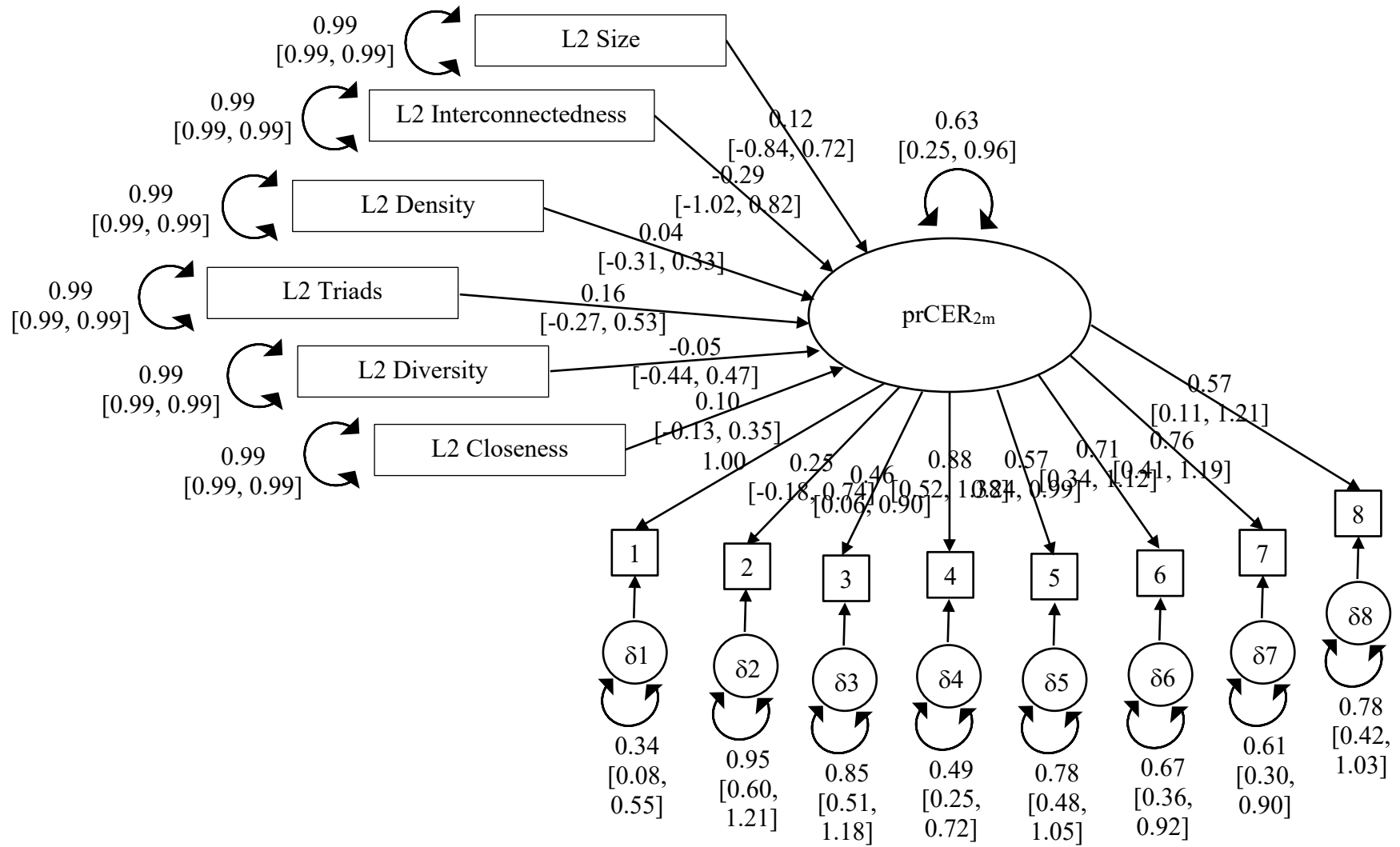
Figure 5. Relationship between second-language (L2) social network characteristics and L2- and mental/emotional health-specific predictive certainty (prCER$_{2m}$).