# Cultural and Linguistic Variables in Usability Testing

by

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## Abstract

Canada is a country where more than 1 in 5 are immigrants. While industries and public services in the country interact with a diversity of users, it is unclear if the cultural and linguistic background of their users can influence their perceived usability. We conducted a usability test of the website of Immigration, Refugee and Citizenship Canada to explore cultural and linguistic variables during usability testing, by using cultural dimensions, global English proficiency index and personality test. Our results show that the dimensions of Individualism, Time orientation, Power distance, and Uncertainty avoidance do influence participants' answers. We found that Indian participants were more comfortable with the website's English level while Chinese and Nigerians criticized it more. This thesis concludes that to assure the consistency, reliability and reproducibility of research results and protocols, researchers should recruit participants from multiple cultural and linguistic backgrounds to gather a general ideation of the usability.

## Acknowledgements

Since this thesis revolves around cultural and linguistic variables, I decided to thank the people who supported me during the past two years in their first language.

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# Chapter 1: Introduction

## 1.1 Motivation

Canada is one of the countries with the highest immigration rate in the world [1]. According to the 2016 census, the government of Canada welcomed 7.5 million immigrants from over 200 countries [2]. This number represents more than 1 in 5 persons in Canada, which gives us a hint on the diversity of users that Canadian industries and public services interact with.

Recently the federal government of Canada is bringing every effort to put their clients at the centre of innovation to account for this diversity [3]. One of the changes the government implemented was that all documentation and communication from its agents and online are required to be written in the English level a grade 8 student could understand or lower [4]. Moreover, many ministries recently built client experience teams within their different branches to do evaluate the usability of their services.

Immigration, Refugee, and Citizenship Canada (IRCC) implemented such a team. Indeed, IRCC is probably the institution with the most diverse clientele in terms of cultural and linguistic backgrounds as they receive all newcomers in Canada through permanent/ temporary immigration, refugee, and citizenship applications to name a few [2]. Current and future migrants in Canada often interact with IRCC's website to read information about the programs and services offered. IRCC's website can be complex for its users as they provide a large variety of services such as student visas, work permit and permanent residency and has information and hyperlinks to answer all these requests.

To help assess the usability of their website and improve the user experience, the client experience team of IRCC recently designed a usability space in their front office located in Ottawa, where they can have clients participate in usability tests. The team tests

their different products and services they offer to assure their efficiency and the positive experience of their users. Their usability tests are primarily conducted in-person with English-speaking participants in Ottawa as they represent a greater share of IRCC's in-person clientele in that office and because many products are first developed in English[1].

Yet, such a large diversity of clients, it is unclear whether cross-cultural and linguistic differences influence users' perceptions, attitudes and expectations during a usability testing and how these differences may influence users' interactions with the moderator [5]. There is a need to address the process of usability testing with a cross-cultural population and improve the reliability and validity in evaluating the cross-cultural results. In this thesis, we used IRCC's clientele to explore this matter and evaluate the usability of their website. This is in the objective of making the users' interactions with the moderator a better experience and assure the results from the study are representative of the users. We also aim for the results to affect usability testing in Canada, but expect that our results could be applied in other countries with usability labs and centres [6] and with high levels of immigration and diversity.

The cultural background of participants can have an impact on their behaviour and answers during interviews, probe testing, survey questions, to name a few [7], [8]. Moreover, the types of interaction between the participant and the moderator could be different during a testing session depending of their respective cultural and linguistic backgrounds [5]. Participants could also have different answer tendencies, such as leaning

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[1] Information given by IRCC employees from the Client Experience Branch based in Ottawa during an informal interview we had with them.

for the extremes in Likert Scale questions (in a 5-point scale, selecting 1 and 5 more often than 2, 3, and 4) or pleasing answers (when a participant tries to answer what they think the researcher wants them to answer) [7]. The cultural background of a participant may also influence how open they are to criticize a product or how shy or scared they are to do so [8]. The perception of ease of use, of usefulness, compatibility and trust on intention to adopt a certain product could also be influenced by cultural variables [9].

Another influencer of the behaviour and answers of participants is the language spoken by the participant versus the language the usability test is proceeded in [10]. Research says that multilingual people adopt different personalities when speaking different languages, thus have different preferences [10], [11]. These differences were also found to have an impact on the perceived usability for interfaces [12].

The major premise of these cross-cultural studies rests on the work of social psychologist Geert Hofstede who explains the matter with 5 dimensions: Power distance, Uncertainty avoidance, Collectivism/individualism, Time orientation and Masculinity/femininity [13]. Hofstede has identified an index score for each of the dimension to more than 50 countries. These dimensions have been used in the field of Human Computer Interaction (HCI) to explore cultural and linguistic variables in different contexts such as usability testing [8], [14]–[18]. Yet, we found little work exploring cross-cultural variables in usability testing precisely, beyond a Usability and Internationalization session at the 2007 HCI International Conference [19].

## 1.2 Research Questions

We are interested in better understanding cross-cultural and linguistic differences in usability testing in the objective to help inform researchers and practitioners on how to account for them. More specifically, we wanted to find out:

- Are there answer tendencies depending of the cultural and linguistic background of the users?
- Do cultural and linguistic variables have more influence on the answer's tendencies than the users' personalities?
- What strategies should we consider attenuating these differences to ensure the consistency, reliability and reproducibility of research and usability testing protocols and results?

To address these research questions, we designed a usability test of IRCC's webpage and collected data with answers from international students discussing their experience navigating and interacting with the webpage. We recruited English speaking international students from three countries, China, India, and Nigeria, because of their differences in scores with Hofstede's dimensions and because of their different backgrounds in English.

## 1.3 Contribution

Our work gives insights on how cultural and linguistic variables influence on answers tendencies of participants during usability testing. Specifically, we compare answers tendencies between international students from China, India, and Nigeria. These findings will inform researchers who prepare and conduct usability testing sessions in English with users of different cultural and linguistic backgrounds to account or minimize possible

cross-cultural biases when developing their study methodology. We provide a research plan and methodology for initial exploration of cross-cultural and linguistic differences in usability evaluations. We also suggest different mitigation strategies when designing a usability test.

## 1.4 Thesis Outline

This thesis is organized in 6 chapters. In Chapter 2, we present the literature on usability testing and its methodological and socio-demographic bias. We discuss the socio-demographic biases by looking at the cultural and linguistic variables during usability testing. In Chapter 3 we present the methodology of our usability testing where we discuss our usability procedure, our surveys, and our recruitment of Indian, Chinese, and Nigerian international students. In chapter 4 we present the results from our usability testing where we evaluated cultural and linguistic variables that emerged from our usability testing. We also present in this chapter the results of our linguistic analysis where we evaluated the English proficiency of our participants and general linguistic variables when it comes to usability testing. We also present the general usability of IRCC's website. We discuss these results in Chapter 5. Lastly, we present the conclusion and future work in Chapter 6.

# Chapter 2: Literature Review

In this chapter, we review prior work on usability testing research methodology, cross-cultural studies, and linguistic analysis.

## 2.1 Usability Testing

The approach of user-centred design often relies on usability testing to improve the quality of the interactive system developed [20]. Usability testing is defined as a testing session of an early prototype or functioning version of a computer interface with representative users attempting representative tasks in a representative environment [21]. This approach encourages designers and researchers to put their user/clients as the base of their innovation of new products and services.

First, researchers must identify representative users to test. Rubin and Chisnell [22] detail that the researchers should identify the relevant behaviours, skills, and knowledge of the typical users. If the researchers fail to identify these elements and test their products with the wrong participants, their results would not be reliable.

After identifying the participants, researchers must develop the usability test. Usability testing can take many forms such as probes, live user observations, activity logging, and video recording [23]. Moreover, to gain additional insights from their users, researchers use methods like self-developed or standardized questionnaires, semi-structured or free interviews, focus groups, and diaries.

Researchers use different strategies when developing their usability tests. Some will opt for field strategies and others for experimental strategies [24]. McGrath [24] explains that researchers will decide to proceed with a field investigation when they want

to observe the “natural” behaviours of their users and to proceed with a laboratory experimentation when they want to engage the participants into specific behaviours. For instance, think aloud is often used in usability testing, but like Hertzum [25] discusses, this method is preferable to use in a lab environment, since it can be unnatural for participants if done in another environment. Rubin and Chisnell [22] also provide a list of factors to help determine whether it is preferable to do the test on the field, in a lab, or remotely. The list contains elements discussing the test design and measures (qualitative, quantitative), the logistic of the study (for example, location, anonymity), and the availability of the participants.

Achieving a fully representative set of users, tasks and environment can be a challenge for researchers since there are many factors that can bias the results. The following sections discuss the potential elements that can influence the results during a usability test.

## 2.2 Biased Results in Usability Testing

We divided the types of factors that can influence the results in usability testing in two main categories: methodological bias and socio-demographic bias. Methodological bias may include the location of the test [26], the number of participants [27], [28], and the experience of the participants [29]. Examples of socio-demographic biases include common elements of comparison in usability testing such as age [30], [31], gender [32], culture and language [10]. In this research, we focussed our attention on the socio-demographic bias of culture and language. However, it is still important to understand the

other socio-demographic and methodological bias and acknowledge their potential influence on the results.

### 2.2.1 Methodological Bias

Many methodological factors can influence the results during a usability test. For instance, it may be difficult to reproduce exact usability test results when they are performed in different locations by different moderators [26]. Depending on the way instructions are given or the way questions are asked, there is a strong possibility that researchers will collect different insights from their participants in different locations [17]. This can be a positive result if the researchers are trying to discover the totality of the problems and issues, but can also be confusing to see which problems matter the most [26].

Researchers also found that participants were giving more elaborate feedback in an in-person context than in an online survey, where they gave shorter answers [33]. Additionally, Sauer et al. [34] found that the presence of the moderator (online or virtual) can influence the participants' behaviour as they may perceive this presence as social pressure hence be cautious with their answers. Grimm [35] discuss this in more detail calling it desirability bias.

Another methodological bias that can occur in usability testing is the number of participants that a researcher decides to have for their usability test [28],[27], [36]. Spool and Shroeder [27] started discussing the sample size of participants by arguing against the popular idea at the time that five participants was the perfect number. They continued their argument by providing a mathematical formula explaining that researchers should estimate the number of potential problems they can discover and an estimate the interest of the users.

Lewis [28] continued on this formula by adding that researchers should also have an idea of how precise their measurement method is. He explains that there is no specific sample size of participants when it comes to usability tests, but the more estimated problems there are the bigger the sample size should be. While Spool and Shroeder started speaking against the goal of 5 participants almost 20 years ago, the ideal number of participants is still vague to this day. Indeed, Barkhuizen [36] explains that it is a matter of epistemology and methodology. He discusses that 5 participants could be an appropriate number for qualitative research such as ethnographic studies, but when it comes to quantitative studies, the number of participants should be bigger to assure the condition of the specific inferential statistic has been satisfied.

Other work found a potential bias when the moderators associate themselves to the product being tested, as it influences the participants to prefer that product [17]. Dell et al. [17] compared participants' preferences when presented two identical videos different qualities, between a case where researchers did not associate themselves to either of the videos and when the researchers associated themselves to the poor-quality video. They found that the number of participants preferring the poor-quality video increased significantly when the researchers associated themselves to it. Moreover, researchers found a correlation between negative public reviews of a product and negative feedback given by the participants and the same pattern happens with positive public reviews influence in positive feedback [33].

In fact, the result bias can start as early as during the recruiting stage of the usability test. Clemmensen and Shi [37] discuss that the type and amount of compensation given to participate are said to have an influence on the results. They give the example that in the

United States, you cannot pay a government agent to participate, but that such rules might be different in other countries hence be easier to recruit participants from certain populations and potentially affect the representability of the user. The sheer presence of a compensation influences people to participate. In addition, some participants might have accumulated experience in doing usability testing, thus have a better knowledge on what type of answers the researchers are looking for [29].

Although we are not exploring the methodological bias in this thesis, we did take these facts into consideration when we designed our usability test to try to avoid potential bias. We discuss these rationales in Chapter 3.

### 2.2.2 Socio-Demographic Bias

In addition to methodological bias, the participants' socio-demographic profile can also influence the results during a usability test. As previously mentioned, it is important for the researchers to identify a representative group of participants to obtain reliable results [22]. This literature review reports on age, gender, cultural variable and linguistic variables as socio-demographic factors. The current section introduced the biases of age and gender. Section 2.3 will detail cultural variables while section 2.4 will focus on language variables.

Rose et al. [31] suggest that when working with teens, researchers should design their usability test to be short and engaging for them since their level of attention and confidence is lower than an average adult. Adding to this, Sonderegger et al. [30] discuss that when evaluating the task completion time, researchers should be aware that the age of the participants can affect the numbers and suggest that younger adults are usually faster in completing tasks than older adults.

Furthermore, prior works have demonstrated that answers from participants can differ depending on their gender [38]. Although this was not evaluated in a usability testing context, Zhang et al. [38] observed that online shopping behaviour differ depending on the gender of the participant. For instance, they found that males were searching more for convenience and looked more carefully at the products than females. This can inform web designers and researchers that this factor can impact their usability test.

Moreover, Kim et al. [32] discuss that argumentation differs depending of the gender and culture of the individual. They found that Korean women take argumentation more as a personal conflict compared to men who perceived argumentation as practical matter and less stressful. This information could be transposed into usability testing and inform the researchers that there is a possibility that women could be less tempted to criticize a product by fear of creating conflict compared to men.

## 2.3 Cultural Variables

Before diving in, like McCrae and Terracciano suggest [39], we remind the reader that stereotyping personality traits and behaviour in cross-cultural studies has to be done carefully and respectfully. As researchers, we are aware of the range of individual differences that can be found within each culture.

The work of Hofstede [13] is preeminent and often cited when it comes to the exploration of cultural variables. Hofstede is a Dutch psychologist who compared and ranked countries based on five dimensions: Individualism/Collectivism (IND), Time Orientation (TO), Power Distance (PDI), Uncertainty Avoidance (UAI), and Masculinity (MAS). We base our research on his work since these dimensions are the only national

cultural classification that has been used to evaluate users' preferences [40]. Hofstede assigned an index score out of 100 for each of the dimensions to all the countries he evaluated, with 50 as the threshold between low (below) and high (above) index scores.

We present Hofstede's dimensions' definitions with examples from the highest and lowest index scores for the respective dimension [13]. We included the index score of Canada to give a perspective of the native country of this project's researchers.

- **Individualism/Collectivism (IND)** is the extent to which members of a society are integrated into groups. For this dimension, the United States have the highest index score and are more individual, while Guatemala has the lowest index score and is more collectivist (**Figure 1**). This means citizens in the United States will prioritize more their well-being over the well-being of the group like citizens from Guatemala would do. In our usability testing, we explored this dimension by analyzing if our participants would prefer to have assistance while navigating the website (collectivist) or would be comfortable doing it by their own (individualist).

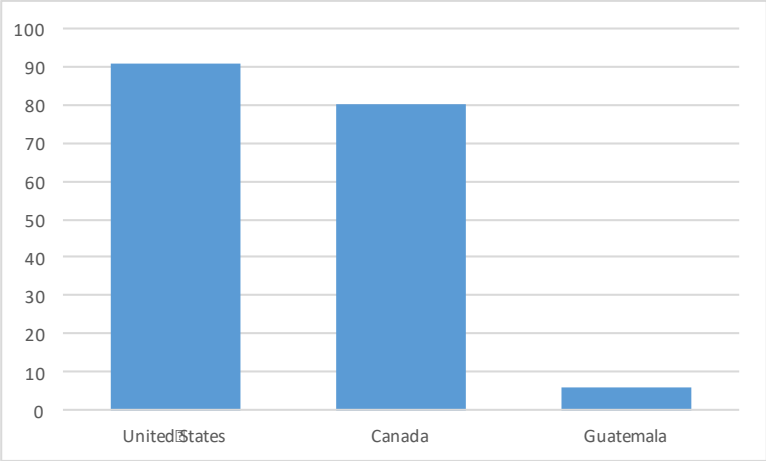


**Figure 1: Individualism index scores from Hofstede** [13]

- **Time Orientation (TO)** is the extent to which people have tendencies to focus on future or present goals. South Korea has the highest score for time orientation and Puerto Rico has the lowest (**Figure 2**). This means South Koreans have more of a future-oriented perspective and see problem solving as a necessity with a long-time orientation and while Puerto Ricans have the shortest time orientation and are more attached and focussed on their traditions. In our usability testing, we explored this dimension by looking at the references where our participants discussed elements of time in the usability test. If they would take the time to review the information or if they would like the navigation and the process to go faster.

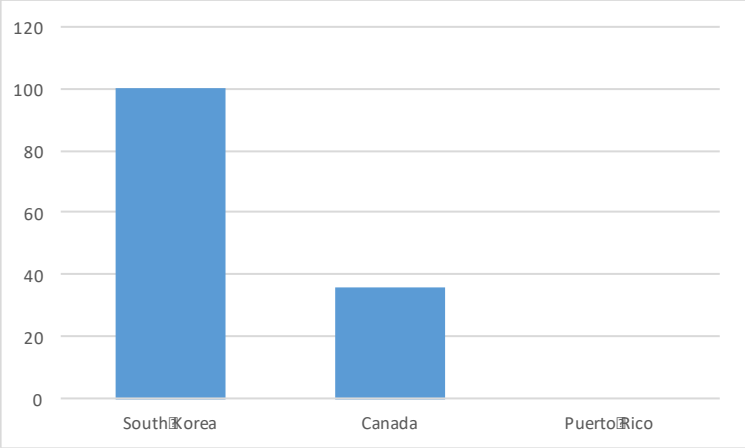


**Figure 2: Time orientation index scores from Hofstede** [13]

- **Power Distance Index (PDI)** is the extent to which the less powerful members of intuitions and organizations within a country expect and accept that power is distributed unequally. Austria is the country with the smallest power distance and Malaysia the country with the largest (**Figure 3**). In this case, Malaysia is the country where its citizens tolerate inequalities in the distribution of power the most and

accept the lack of democratic rights, while Austria is a country where its citizens have strong beliefs in democratic rights and in equal distributions of power. In our usability testing, we explored this dimension by looking if our participants would prefer to follow the instructions and suggestions given by IRCC or decide to do something else.

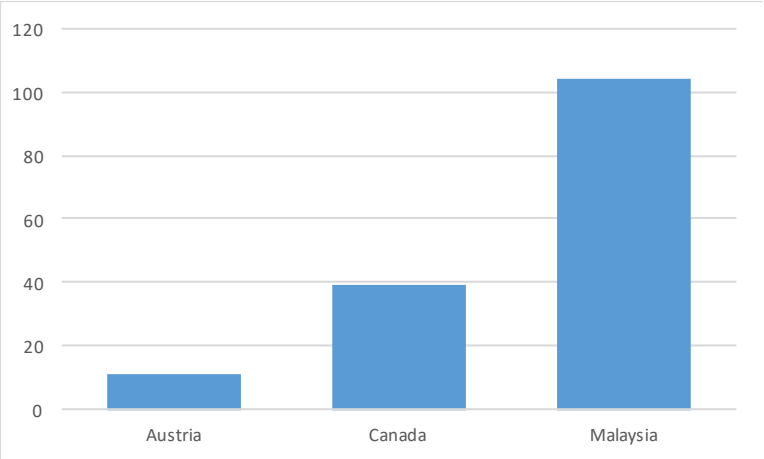


**Figure 3: Power distance index score from Hofstede** [13]

- **Uncertainty Avoidance Index (UAI)** is the extent to which the members of a culture feel threatened by ambiguous or unknown situations. Greece is the country with the strongest uncertainty avoidance and Singapore is the country with the weakest (**Figure 4**). This means Greeks are more uncomfortable when faced to unknown situations and prefer to have a timeline and outcomes expectations while people from Singapore are more comfortable in unknown situations. In our usability testing, we explored this dimension by analyzing the comments of our participants to see if they were positive or negative critics.

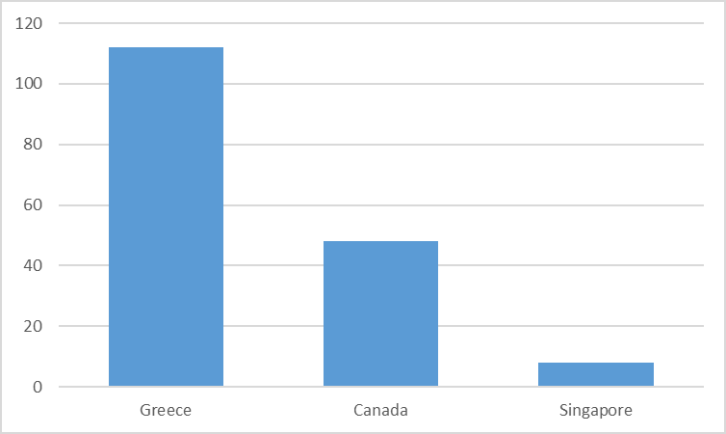


**Figure 4: Uncertainty avoidance index scores from Hofstede** [13]

– **Masculinity/Femininity (MAS)** is the extent to which men and women within a country have distinct or overlapping emotional gender roles. Slovakia scored higher on the masculinity scale while Sweden scored the lowest on the scale and is more feminine (**Figure 5**). This means people from Slovakia are more temped to prone heroism, achievements, and success while people from Sweden are more tempted to prefer cooperation, modesty, and care for equality between gender roles.

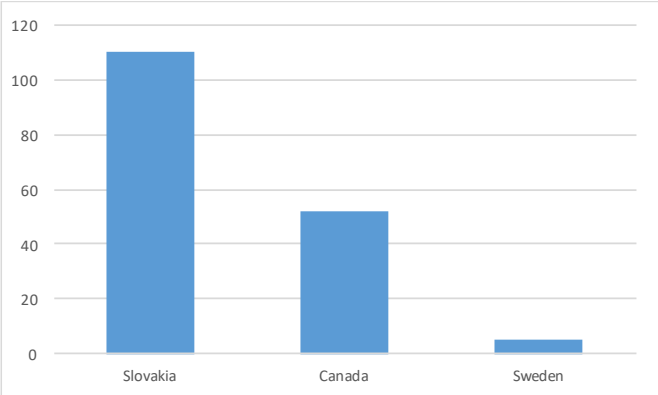


**Figure 5: Masculinity index scores from Hofstede** [13]

For this thesis, the dimension of masculinity was not considered since this concept has been more developed by the rise of women and gender studies contradicting the work of Hofstede [41]. We used the other four dimensions to explore behaviours and habits during our usability testing session. Concrete examples of researchers who applied those dimensions to specific study will be discussed in the following section.

### 2.3.1 Cultural Variables in Usability Testing

Although Hofstede's work was done for the workplace comparing answers from IBM employees across the world, his research has previously been used in the field of Human Computer Interaction to explore cultural variables, as these dimensions can have a high influence when it comes to technology adoption [14]. However, to the best of our knowledge, there are only a few studies that explored these variables in the context of usability testing. Lee and Lee [8] conducted three types of research methods: probe, usability tests, and focus groups with the objective to compare the influence of individualism/collectivism in these contexts. They did so with participants from two countries: Korea (collectivist) and the Netherlands (individualist). They concluded that participants from the Netherlands were more engaged and elaborate in their answer during the usability test and the focus group, while participants from Korea were more reserved and quieter. They also found that participants from the Netherlands were more open to criticize the probe compared to participants from the collectivist country who did not make any complaints but would put the blame on their lack of experience.

Wallace et al. [42] explored if there was a correlation between Hofstede's dimensions and usability attributes. They surveyed 144 participants from four countries:

New Zealand, Philippines, Taiwan, and the USA about the importance they give to the usability attributes of: effectiveness, efficiency, and satisfaction. They did not find any correlation between Hofstede's dimensions and the attribute of effectiveness but did find correlations for efficiency and for satisfaction. They found that preference for efficiency was influenced by the power distance index and that individualist groups preferred the efficiency over the other attributes. Moreover, they found that collectivist groups preferred the attribute of satisfaction. They also mention that the attribute of satisfaction was also preferred by the groups with short term orientation and weak uncertainty avoidance.

Vatrapu and Pérez-Quiñones [16] explored the dimension of power distance during structured interviews while evaluating the usability of a website. They observed how the nationality of the interviewer could influence the effectiveness of the interview. To do so they recruited two groups of Indian students. One group did the interview with a local interviewer from India and the other one did it with an American interviewer. They found that participants were giving more feedback and responded more freely when the interviewer was from the same culture as them. Although the authors are not sure if this is due to the fact that the participants were from a high-power distant country, their results give us insight on the influence of the origin of the researcher. In fact, these results correlate with the study of Dell et al. [17], who studied the response bias caused by the moderator, specifically between a local and a foreign moderator. They found that participants preferred more the product when the moderator was foreign than when it was a local moderator. Moreover, preliminary results from a study done by Shi and Clemmensen [18] suggest that participants from a low power distance country, in this case Denmark, do not seem to care if the moderators are foreign or not.

### 2.3.2 Cultural Variables in Other Research Methods

While not many studies have explored cultural variables with Hofstede's dimensions in the context of usability testing, some works have studied these variables in different contexts such as in surveys and content analysis. These findings helped us shape our study and data analysis.

In a survey, Figueroa et al. [9] compared the perception of ease of use, the perception of usefulness, and the compatibility and trust on intention to adopt e-government services between Spain and the United States. They found that individualism does not affect the adoption of e-government. They also found that uncertainty avoidance and power distance had an impact on the trust on e-government intentions. Spain has a higher rank in both of these dimensions and had better trust with e-government intentions.

Sonderegger and Sauer [43] found that the more aesthetically pleasing a prototype looks the more participants will prefer the prototype. In cross-cultural studies, Alexander et al. [44] explored web interface designs with the objectives to develop a "cross-cultural web usability model." They studied different webpage designs from three countries: Australia, China, and Saudi Arabia to compare elements such as the layout, navigation, links, multimedia, visual representation, colour. They found that countries with high uncertainty avoidance tempt to prefer clear navigation paths with no or rare interruptions. They also discuss that visual perceptions are influenced by the participant's collectivism or individualism and their power distance index. Singh et al. [11] came to similar conclusions while studying Hofstede's index scores by looking at webpages from Japan, China, India and America. More works have been done to look at interface's designs in

link with the cultural dimensions of Hofstede. Reinecke and Bernstein [40], [45] compiled and summarized their findings in the literature in **Figure 6**:

| | Low Score | High Score | Reference |
|---|---|---|---|
| Power Distance | Different access and navigation possibilites; nonlinear navigation | Linear navigation, few links, minimize navigation possibilities | Burgmann et al. 2006<br>Marcus and Gould 2000<br>Voehringer-Kuhnt 2002 |
| | Data does not have to be structured | Structured data | Marcus and Gould 2000 |
| | Most information at interface level, hierarchy of information less deep | Little information at first level | Burgmann et al. 2006<br>Marcus and Gould 2000 |
| | Friendly error messages suggesting how to proceed | Strict error messages | Marcus and Gould 2000, 2001 |
| | Support is only rarely needed | Provide strong support with the help of wizards | Marcus and Gould 2000 |
| | Websites often contain images showing the country's leader or the whole nation | Images show people in their daily activities | Gould et al. 2000<br>Marcus and Gould 2000 |
| Individualism | Traditional colors and images | Use color to encode information | Marcus and Gould 2000 |
| | High image-to-text ratio | High text-to-image ratio | Gould et al. 2000 |
| | High multimodality | Low multimodality | Hermeking 2005 |
| | Colorful interface | Monotonously colored interface | Barber and Badre 1998 |
| Masculinity | Little saturation, pastel colors | Highly contrasting, bright colors | Dormann and Chisalita 2002<br>Voehringer-Kuhnt 2002 |
| | Allow for exploration and different paths to navigate | Restrict navigation possibilities | Ackerman 2002 |
| | Personal presentation of content and friendly communication with the user | Use encouraging words to communicate | Callahan 2005<br>Dormann and Chisalita 2002<br>Hofstede 1986 |
| Uncertainty Avoidance | Most information at interface level, complex interfaces | Organize information hierarchically | Burgmann et al. 2006<br>Cha et al. 2005<br>Choi et al. 2005<br>Hodemacher et al. 2005<br>Marcus 2000<br>Marcus and Gould 2000, 2001<br>Zahed et al. 2001 |
| | Nonlinear navigation | Linear navigation paths / show the position of the user | Baumgartner 2003<br>Burgmann et al. 2006<br>Corbitt et al. 2002<br>Kamentz et al. 2003<br>Marcus 2000<br>Marcus and Gould 2000, 2001 |
| | Code colors, typography & sound to maximize information | Use redundant cues to reduce ambiguity | Marcus and Gould 2000, 2001 |
| Long Term Organization | Reduced information density | Most information at interface level | Marcus and Baumgartner 2004<br>Marcus and Gould 2000 |
| | Content highly structured into small units | Content can be arranged around a focal area | Marcus and Gould 2000 |

**Figure 6: Relationship between Hofstede's Dimensions and UI Aspects** [45]

Guzman et al. [46] also used Hofstede's dimensions to compare online feedback in an online store and found that there is a correlation between the user's cultural background and the type of feedback that is written and suggests being careful when analyzing this sort of data.

Lastly, other studies can inform potential cultural bias in usability testing like Profita et al. [19], who did not use Hofstede's dimensions, but studied social acceptability of wearables. They found that Chinese and Americans people do not have the same preferences for the locations and interactions style for wearable devices. Montero et al. [20] looked into how different gestural interactions be accepted differently by users. They found that the more noticeable a gesture is the less chance it will be socially accepted. Interestingly, Dierk and Paulos [21] explain that getting inspiration from the cultural norms and practice of a specific culture when designing a product, in this case they looked at cosmetic computing, increases the chances for the product to be socially accepted. Therefore, usability tests should imitate actual tasks the participant would perform with a given product and be realistic [22].

### 2.3.3 Personality Variables

When accounting for cross-cultural variables, some authors also study personality traits in parallel with Hofstede's cultural dimensions. One of the most popular scales for personality trait is the Big Five personality traits [47]. The Big Five is a scale of five personality traits [48]:

- Openness to experience: being curious and seeking new experience.
- Conscientiousness: being well organized or reliable.

- Extraversion: being talkative, energetic, or sociable.
- Agreeableness: being friendly, helpful, kind, or warm.
- Neuroticism: being anxious, irritable, or anger.

Migliore [49] found a correlation between the personality trait of Extraversion and the dimensions of Individualism and Uncertainty avoidance. Moreover, Scott et al. [50] found that Individualism and Neuroticism are important influencers on the perceived quality of video while Power distance, Uncertainty avoidance, and Openness to experience are important influencers on the enjoyment. They also found that Conscientiousness and Masculinity are important influencers on both the perceived quality and the enjoyment. Chien et al. [48] found a correlation between Agreeableness and Conscientiousness for initial trust in automation.

## 2.4 Language Variables

When it comes to studying linguistic variables, it is necessary to explore the predominance of English in the world. Indeed, according to the British Council, a quarter of the world speaks English, with non-native speakers outnumbering native speakers with a ratio of 4:1 [51]. For this research, we are interested in the prevalence of English often observed in the technological field. Indeed, more than half of the most visited websites are written in English [52]. Additionally, most of the influential companies in technologies are Americans, thus provide services in English, which makes it difficult for non-English-speaking tech workers to access key resources and services to evolve their skills in their native language [52].

Karusala et al. [53] explored this matter in India. Their data shows that even though the interface provides tools to translate the settings and keyboard into their native language, the majority of the users preferred to keep the interface in English. One of the reasons was that some people did not know how to change the settings due to their low experience with the interface. Additional reasons were because they wanted to practise their English and because they found the translation and keyboard tools too cumbersome to use. Finally, the interviewees stated that some English technical terms for mobile devices were considered "standard" and thus, did not like how they were translated in their native language. Terms like "brightness" and "settings" are hard to translate in Hindi. The authors also found that people thought they were losing the meaning of the terms once translated in their own language and feared missing out. Calvet [54] explains this common situation with the term of vehicular language where individuals change language depending of the context they are in.

### 2.4.1 Linguistic Variables in Usability Testing

Sun and Shi [5] explored if there were differences in a usability test when speaking another language. They observed that there were differences in the types of interaction between the participants and the moderator depending on the language spoken during the usability test. They tested different pairs of bilingual Chinese moderators and participants. When the moderator and the participant were speaking Chinese, the moderator took more time to introduce the project and gave more help and encouragement to the participants. When both were speaking English, the moderator and participants would make eye contact to make themselves understood and the moderator would be more careful of the task list.

Previously cited, Singh et al. [11] not only studied cultural variables but also looked into linguistic variables with interface design's preferences. They found that level of white space, the number of hyperlinks, the length of text and more varies when looking at different countries with different national languages. An explanation is that language is said to form an individual's personality and opinions [55]. This means that one may prefer advertisements and an extra loaded interface while one may, on the other hand, prefer a more refine page with more images and less text. This fact was also found to have an impact on the perception of usability for interfaces [12]. This is why Hillier [10] suggests that an interface should be built by a designer who speaks the same language as its users.

Lastly, for this section, we cannot discuss linguistic variables without going over the topic of translation. Dorothée Behr [56] discusses this matter regarding the translation of questionnaires. She explains that when survey questions are translated by a second party, the questions usually come to the translator without any context. She tries to bring awareness that words can have different meanings in different languages thus, without the context, the translator cannot, all the time, translate appropriately the questions to obtain the expected answers. In a similar direction, Finstad explored usability testing in a second language with a short survey: The System Usability Scale [57]. His main finding was that most non-native English speakers did not understand the word "cumbersome." Furthermore, Yammiyavar et al. [58] bring awareness on the fact that non-verbal cues during usability evaluations, like words, can mean different things for different cultural backgrounds.

## 2.5 Tools and Solutions

To account for these cultural variables bias, we find systems and tools to help recognize them. Heimgärtner [59] presented the "Intercultural Interaction Analysis" tool (IIA), which helps identify variances in user interactions in system navigation. MOCCA [40], [45], [60] has also proven its abilities to adapt an interface according to a check list filled by the users prior to start the navigation. The check list was designed to analyze the user's cultural background using Hofstede's dimensions to guide the list. Although these two tools have only been tested in their respective laboratory, they can help bring the necessary modifications to adapt an interface with the user's preferences.

For the linguistic aspect, Ling et al. [61] are trying to design better tools for multilingual web search interfaces by exploring different display of multilingual search results. They found that participants preferred when the search results were displayed in two distinct panels and not all mixed together. To remediate cross-cultural communication problems, Jiang and Wang [62] suggest that the solution should be earlier than trying to implement new systems and try to teach better English in foreign countries. Even though mobile phones are now used to learn English, some countries still value the professors' knowledge more than a phone when it comes to learning English [63]. Furthermore, research demonstrates that being interested in learning a foreign language could be linked to the interest in cross-cultural communication [64].

# Chapter 3: Methods

Our research questions are the following:

- Are there answer tendencies depending of the cultural and linguistic background of the users?
- Do cultural and linguistic variables have more influence on the answers tendencies than the users' personalities?
- What strategies should we consider to attenuate these differences to ensure the consistency, reliability and reproducibility of research and usability testing protocols and results?

To answer our research questions, we developed a usability test of an IRCC webpage to collect data from international students from China, India, and Nigeria regarding their behaviour and answers' tendencies in the context of usability testing.

## 3.1 Population Rationale

To explore variables in usability testing, we required a population of participants who would have different cultural and linguistic backgrounds. To help us determine this population, we first selected the language of the usability test. We decided to do our study in English, since it is one of Canada's official languages and it is the predominant language in the world, hence more IRCC clients are likely to speak English. In addition, there is more information about its use in other countries [52]. We leave to future work the evaluation of IRCC usability sites in French.

We opted to use international students as our participants, as they come from a variety of home countries. They are likely to all have a similar level of experience with the website of IRCC (having had to obtain a study Visa).

Based on the country of origin of Carleton University international students [65], we selected to focus on international students coming from three countries: China, India and Nigeria, as they were the most populous in terms of incoming international students (Table 1) yet they have different uses of English and different index scores in Hofstede's dimensions (Figure 7). Moreover, China and India are in the top 5 countries of birth of recent immigrants in Canada [2] (Table 2), which makes our groups more representative of IRCC's clients.

**Table 1: Top 5 countries of international students at Carleton University in 2018** [65]

| Country | China | India | Nigeria | Egypt | Bangladesh |
|---|---|---|---|---|---|
| Number of students | 1734 | 528 | 484 | 127 | 97 |

**Table 2: Top 5 countries of birth of recent immigrants in Canada in 2016** [2]

| Country | Philippines | India | China | Iran | Pakistan |
|---|---|---|---|---|---|
| Number of immigrants | 188 805 | 147 190 | 129 020 | 42 070 | 41 480 |

**Use of English:** Although Nigeria is not part of this top 5, having between 10,001 and 50,000 of immigrants in Canada according to the census in 2016 [2], we decided to include them to better evaluate linguistic variables to have them as a control condition. Indeed, those three countries have different use of English. Nigeria has English as an official language. In India, English is not recognized as an official, but is spoken in many academic

and professional institutions to communicate since people speak different dialects [66]. In China, English was recently institutionalized, thus is not as often spoken compared to Nigeria and India [67]. According to the EF English Proficiency Index [52], which evaluate non-native English speakers' English abilities, India and Nigeria have a moderate proficiency ranking 28th and 29th out of 88 while China has a low proficiency ranking 47th.

**Hofstede Cultural Dimensions**: The three countries have a similar index score for the power distance dimension (Figure 7). Nigeria as a higher uncertainty avoidance index score. India is more individualist. China has a longer time orientation. Prior work has observed these index scores variations creating differences in the way participants could think, act and feel during a usability test.

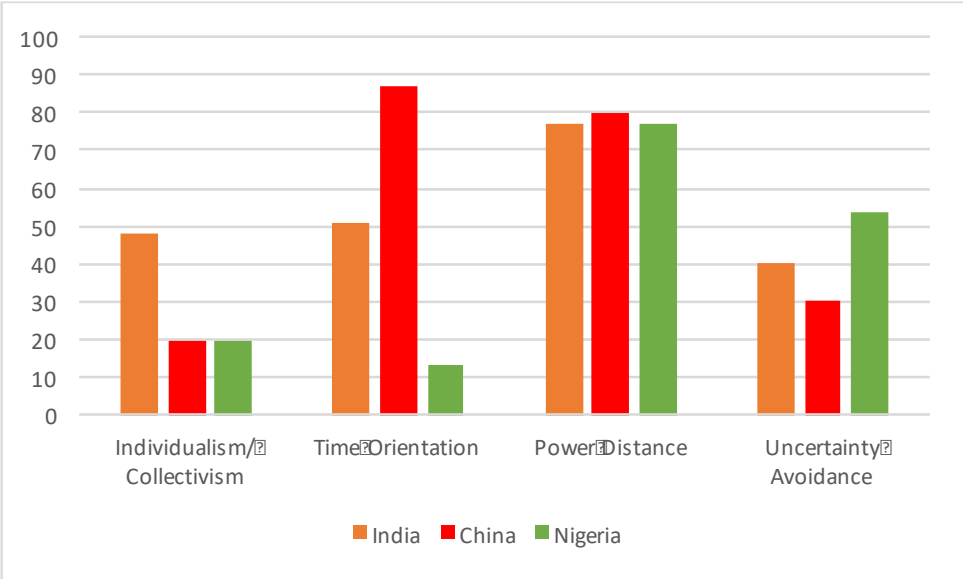


**Figure 7: Hofstede Cultural Dimensions Scores for China, India, and Nigeria** [13]

**Exclusions:** We did not include any native Canadians as they do not need to interact with IRCC, and, as such, are not representative users. We also do not include any permanent

residents or foreign-born Canadian citizens as we assumed they would have had an extensive level of interaction with the application process and IRCC website, which could in turn bias the results.

## 3.2 Study Methodology

We divided this section in three parts where we discuss the procedure of our usability test, the design of our survey, and our recruitment methods.

### 3.2.1 Usability Test Procedure

We developed the usability test of the webpage of IRCC to collect data from international students to explore their behaviour and answers' tendencies in the context of usability testing. This usability testing focuses on qualitative measurements.

We evaluated IRCC's website, specifically the application process for a post-graduate work permit. We made our participants navigate IRCC's webpage from the home page and guided them with instructions through different links. The instructions were the same for all our participants and were leading them to a page where they had to fill out a questionnaire to assess for eligibility for the work permit (Figure 8).

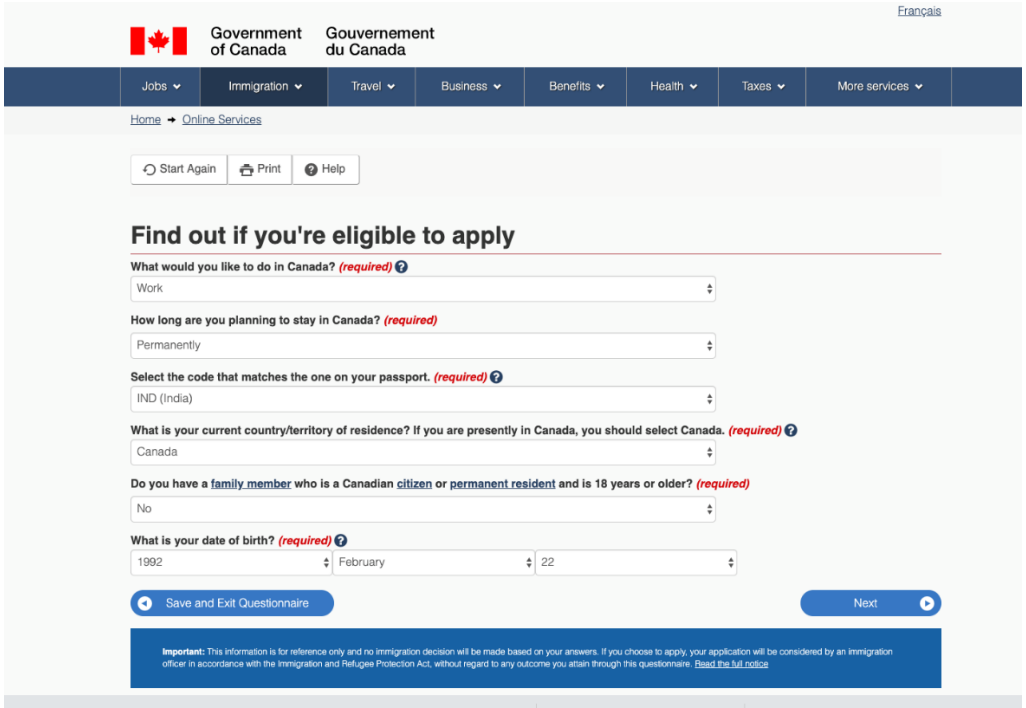


**Figure 8: Screenshot of the first page of the questionnaire form IRCC our participants had to fill**

Since the website of IRCC contains many links to directs its users to different pages according to their needs, we gave a scenario to our participants to make sure they would all have the same experience navigating the website and for the consistency of our results (Appendix B ). The scenario described a fictive persona named Anika who was a student finishing her master thesis at Carleton University. She had intentions to stay in Canada by applying for a work permit and started to look on IRCC's website to read information about the application process. We designed this persona as to be a representative user of IRCC. This persona was informing our participants about the context of the navigation they will

have to do on the website. Following this short description, we gave our participants instructions to find specific links starting from the main webpage of IRCC[2]:

- From the main page, find a link where you can read information about a "student work permit."
- Once you found the link, find a link on the page where you can read information about "changing your conditions and stay in Canada."
- From that page, "find out if you are eligible to apply online."
- From there, they had to fill a questionnaire done by IRCC with pre-filed answers we gave them.

We let our participants read the entire webpage to look for the specific hyperlinks and navigate where they thought would be the right link. We redirected the participants if we saw they were going too far from the wanted link. Because we did not want to collect their personal information and for privacy concerns, we provided our participants with fill-in answers for the questionnaire. The answers were fictive and attributed to the persona of the scenario: Anika. Having our participants filling the questionnaire with the same answers also meant that they would have the same results and answer at the end of the questionnaire, thus would not influence their answers in our survey and short interview.

Because we gave our participants the specific links where they had to go and redirected them if they were going too far on the website this made the navigation on the website and the overall experience less realistic and easier to the participant. Additionally,

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[2] https://www.canada.ca/en/immigration-refugees-citizenship.html

Karat et al. [68] found that participants identify less and least severe problems when they are walked through the test. For this reason, we wanted to provoke our participant to criticize the website to better explore the dimension of Uncertainty avoidance better. Our provocations were the following:

- The links given were not the right ones (student work permit) instead of post-graduate work permit.
- The questionnaire was not for a work permit, but for "express entry" to Canada as a future migrant.
- We gave high linguistic score to Anika, knowing the answer from IRCC's questionnaire was generic and asked to improve English score no matter if the score was high or not:
    - Speaking: 8.5/9
    - Listening: 9/9
    - Reading: 8/9
    - Writing: 9/9

To explore our participants' reaction to these provocations we asked them if they thought they found the necessary information for Anika to pursue an application with ease. We also analyzed the critics in all the answers our participants gave during the short interview.

With this scenario, we conducted a between subject design. We changed the persona's nationality to match the nationality of our participants. Anika would be Indian if the participant was Indian, Chinese if the participant was Chinese, and Nigerian if the participant was Nigerian. This variation did not affect the results at the end of the

questionnaire of IRCC. We did this to make the scenario closer to what our participants would experience in real life like usability research suggests to do [21].

The usability test lasted 30 minutes. The participants were navigating and interacting with the website for approximately 15 minutes and answering questions for the following 15 minutes. There is no specific duration for usability tests, but most of the work on usability testing discuss the importance of the tasks being representative of a real-life situation [21].

### 3.2.2 Survey Design

For this study, we opted to proceed with a mixed methodology of data collection. We developed a survey of 22 multiple-choice, Likert scale or text-entry questions divided in three parts (Appendix A ):

- Socio-demographics:

  Gender, age, education, nationality, languages spoken, and abilities in English.
- Ten-Item Personality Inventory test [69]
- System Usability Scale [57]

To avoid the bias of generalizing behaviours belonging to one country, we decided to include the Ten-Item Personality Inventory test (TIPI) [69] to our study. One of the criticisms Hofstede received on his work was that he temped to forget the individual in his conclusions [70]. We understand that our participants are individuals at first and that personality factors might also affect the results of our research.

We used the System Usability Scale (SUS) [57] survey to collect data on the usability of the webpage, but also to explore tendencies when answering Likert Scale

questions as suggests Duh and Chen [7]. We excluded 5 questions from the System Usability Scale since they would not apply to our participants experience in our specific test. Here are the 5 questions we included in our usability test:

- I found this website unnecessarily complex
- I think that I would need assistance to be able to use this website
- I thought there was too much inconsistency in this website
- I would imagine that most people would learn to use this website very quickly
- I felt very confident using this website

To collect qualitative data, we developed a semi-structured interview of 9 open-ended questions that we asked participants at the end of the usability test. We developed the questions with the objective to gain insights on Hofstede's dimensions and linguistic variables. We consulted a Linguistic Anthropologist Professor and a Woman and Gender Studies Associate Professor interested in global migration from Carleton University to develop these questions. We did so with the objective to target specific dimensions, linguistic variables, and insights about the usability of IRCC's website (Figure 9).

| | |
|---|---|
| •How do you feel about what you just went through? | Power distance, Time orientation, Uncertainty avoidance, Interpretation of the question |
| •Do you think you found the necessary information for Anika to pursue an application with ease? Why? | Power distance, Uncertainty avoidance |
| •How do you feel about the answer Anika got after the research and questionnaire you did? | Power distance, Time orientation, Uncertainty avoidance Interpretation of the question |
| •How did you find the language IRCC used on their website? Did you find the information easy to understand? | Ease with the English level of IRCC |
| •Was there any time where you had to read again a word or section more than once to better understand the content and meaning? | Ease with the English level of IRCC |
| •What would be your next steps after the answer Anika got after the questionnaire? What would you do next? | Power distance, Time orientation |
| •In a real life situation would you have liked to review this process with someone? (for the language, reassurance, etc) | Individualism/ Collectivism |
| •What was your first impression when you entered the website? | Insights on usability of IRCC's website |
| •What did you like or dislike about the website? Why? | Insights on usability of IRCC's website |

**Figure 9: Survey questions with concepts we analyzed for each question**

Before the official recruitment for the usability test, we piloted the study with two international students, one from Guatemala and one from India, to evaluate the suitability of the questions and the overall proceeding of the study.

### 3.2.3 Recruitment

We did our recruitment at the main campus of Carleton University and of the University of Ottawa. We recruited through social media (Twitter, Facebook) on targeted groups of both universities in Ottawa such as the Carleton Research Participant page, the Carleton Indian Students' Association (CISA), The Carleton University Chinese Students Association, the Carleton University Nigerian Student Association (CUNCA), and uOttawa Bureau International Office, with permission of the group administrators. In addition, we put posters around the Carleton University campus to recruit participants. We also used the snowball method by asking participants, graduate administrators and faculty members to share our interests in recruiting participants among international students from India, Nigeria and China.

Usability testing sessions occurred over a period of 9 weeks between March 29th and May 23rd and were scheduled with the application "Calendly" by the participants. We excluded any participants who were not international students, over 18 years-old, from India, Nigeria or China, located in Ottawa, and comfortable speaking in English. Participants received a $10 compensation for their time. We obtained ethical clearance from the Carleton University Research Ethics Board (CUREB-B #110528)(Appendix A ).

## 3.3 Participants

We conducted our usability test with 30 international students (Table 3): 12 from China, 14 from India, and 4 from Nigeria (Table 3). 3/12 Chinese students, 8/14 Indian students, and 4/4 Nigerian students self-identified as male, the others all self-identified as female. The ages ranged from 20 to 37 years old (*M*=24.58, SD= 4.54) for Chinese students, from

19 to 34 years old (*M*=24.79, SD= 3.66) for Indian students, and from 18 to 22 years old (*M*=19.75, SD= 1.71) for Nigerian students. Most of our participants were master and undergraduate students at the exception of one PhD student from China.

**Table 3: Participants socio-demographics**

| | Male | Female | Mean Age | Undergrad | Master | PhD |
|---|---|---|---|---|---|---|
| **India (N=14)** | 8 | 6 | 24.79 | 2 | 12 | 0 |
| **China (N=12)** | 3 | 9 | 24.58 | 5 | 6 | 1 |
| **Nigeria (N=4)** | 4 | 0 | 19.75 | 4 | 0 | 0 |

Figure 10 shows the English abilities of the participants by nationalities. We use domain descriptive to inform the language proficiency of our participants. We attributed Conversational level to the level B of the Common European Framework of References for Languages (CEFR) [71], Business level to the level C, and Fluent level to almost native. The Indian and Nigerian groups of participants had a majority of fluent English-speaking participants, while the Chinese groups of participants had more business English-speaking participants.

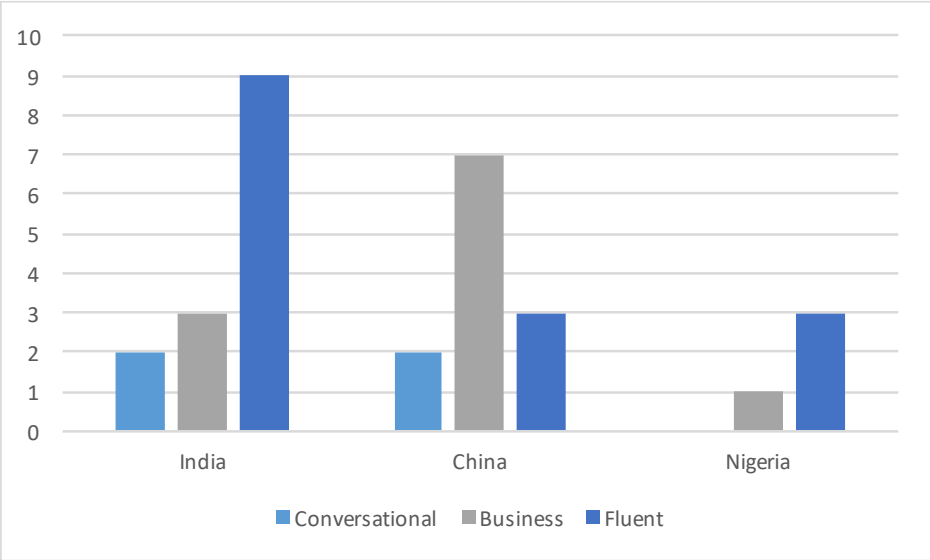



**Figure 10 Participants English Abilities by Nationality**

We present the Ten Item Personality Test (TIPI) results in Figure 11. Indian and Chinese participants have similar profiles with a higher mean for "Conscientiousness", "Agreeableness", and "Openness to Experiences", with India having a higher score for "Openness to Experiences" and China for "Conscientiousness". Nigerian participants had a different profile with "Neuroticism" being higher than "Agreeableness". Like Chinese participants, Nigerian participants also scored higher for "Conscientiousness". We notice that there is a lot of overlapping between the error bars representing the standard deviation, which typically indicates the difference between the personality traits may not be statistically significant. We analyzed these results in a later section to explore if personality traits have a bigger or smaller influence in usability testing answers than the cultural dimensions.

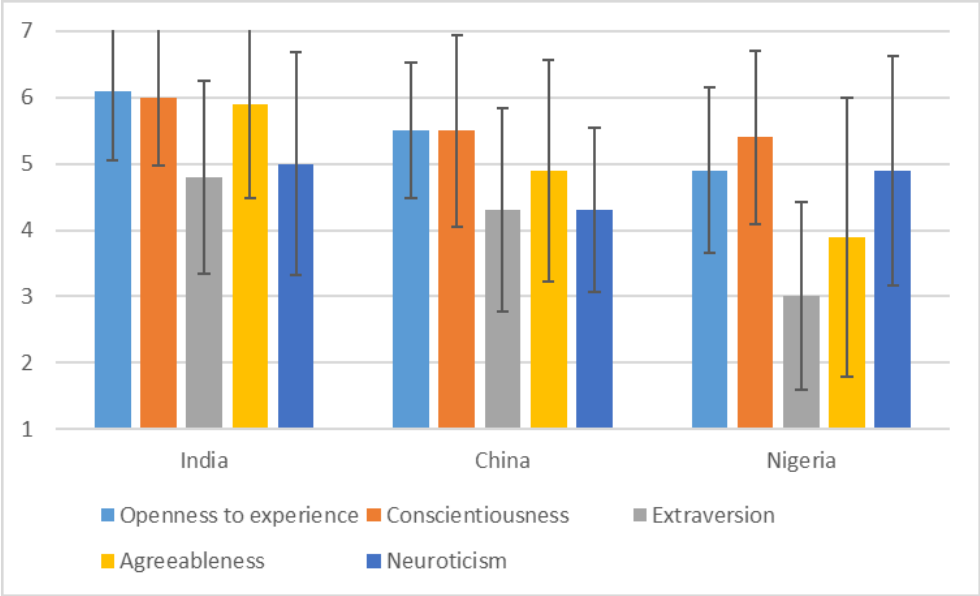



**Figure 11: TIPI score by nationality with error bars representing standard deviation**

### 3.4 Potential Bias

As discussed in the previous chapter, there are multiple potential biases during usability testing. In our case, we want to acknowledge the fact that our main researcher who conducted the study with participants is a female French Canadian. We note that that a foreign moderator (i.e., someone who does not have the same nationality as the participants, in this case Canadian instead of Indian, Chinese or Nigerian) can influence participants to prefer the product [16]. However, this would be representative of typical IRCC personnel conducting usability tests. However, we assured that the participants understood the main investigator was not associated to IRCC as to avoid them preferring the product [17].

# Chapter 4: Results

In this chapter, we first present how we analyzed our data. We continue by presenting our results for the dimension of Individualism/Collectivism, then follow with Time orientation, Power distance, and Uncertainty avoidance. Furthermore, we present our results from our analysis of the personality test our participants answered in comparison with the cultural dimensions. We then continue with our analysis of the Likert scale answer's tendencies and our linguistic analysis.

## 4.1 Data Analysis Methodology

We transcribed and coded the qualitative answers from the short interviews using Nvivo12 [72]. We coded our qualitative data using predefined themes from Hofstede's dimensions' key differences [13], listed in Table 4 with a descriptor for each. We also created our own themes for the linguistic analysis (Table 5) and used an additional coding technique, action coding, for a specific question [73]. We later divided these themes into categories to better analyze our results.

**Table 4: Key differences (in white) between the level of each dimensions [9]**

| Dimension | High level of the dimension | Low level of the dimension |
|---|---|---|
| **IDV** | **Collectivism** | **Individualism** |
| | Interdependent self | Independent self |
| **TO** | **Long-Term Orientation** | **Short-Term Orientation** |
| | Perseverance, sustained efforts toward slow results | Efforts should produce quick results |
| **PDI** | **Large Power Distance** | **Small Power Distance** |
| | Subordinate expect to be told what to do | Subordinates expect to be consulted |
| **UAI** | **Strong Uncertainty Avoidance** | **Weak Uncertainty Avoidance** |
| | Citizen protest should be repressed | Citizen protest is acceptable |

**Table 5: Linguistic themes for our data analysis**

| Linguistic Themes | Definition |
|---|---|
| **Interpretation of the question** | How participants interpret "how do you feel about" |
| **Clarification of the questions** | Which question participants did not understand |
| **Thoughts on Language** | How participants found the language used by IRCC |

We discuss our results using a similar terminology as NVivo12 [74], using terms such as: coding, theme, category, and reference.

- We refer as **coding** to the action of assigning participants' comments to a theme.
- We refer to a **theme** as a folder that gathers common content across all of our participants.
- We refer to a **category** when we divide a theme into sub-themes.
- We refer to the number of **references** as the number of selections in the interview answers that we coded to a specific theme.

In our research, the themes in our cultural analysis are typically referred to the low and high indexes of a dimension. For instance, the dimension of Individualism/Collectivism has the themes of Individualist and of Collectivism. Additionally, we added extra themes to certain dimensions when needed. For example, we added the theme "Both" to the dimension of Individualism/Collectivism because we found participants discussing both elements within a single comment.

Because we had dimensions that could be analyzed in more than one answer, participants could have more than one comment referring to a specific dimension/theme during the interview, which is why we decided to account for the number of references. We note here that a reference can be coded to multiple themes.

Lastly, for the anonymity of our participants and for ethical reasons, we attributed an alpha numerical coded identity to each of our participant prior to the usability test. We have three groups of code, one for each country. The identity codes include 2 letters and 2 numbers. All participants coded identity start with P (participants) followed by the first letter of their native country (I: India, C: China, N: Nigeria), followed by the order we had them scheduled. For example, PC02 was our second participant from China to participate in our usability test.

## 4.2 Cultural Results

We divided the following sections to present our findings from our usability test for each of the four cultural dimensions we analyzed. For each dimension, we present the themes in which we coded our references and compare the results between the three countries. From this comparison, we can identify who has a higher or lower level for the dimension. We follow this analysis by doing a second comparison between these results and Hofstede's index score rankings presented in Figure 7. This comparison helps identify if our results correspond to Hofstede's index ranking or if they are different and indicates a potential bias using this index.

### 4.2.1 Individualism/Collectivism

We divided this dimension into three themes: Individualism, Collectivism, and Both. We coded Individualism when participants mentioned they prefer to navigate and do a similar application process online by themselves. We coded Collectivism when participants mentioned they would require and or prefer assistance. We coded Both when participants

referred to both concepts. For this dimension and for the one of Time orientation, we discuss the number of participants and not the number of references, as the close-ended question (would prefer assistance or no) only lead to attributing one reference for each participant.

6/14 Indian participants, 4/12 Chinese participants, and 0 Nigerian participants mentioned they would prefer to go over the process by themselves (Figure 12). With the exception of 2 participants (1 Indian and 1 Chinese), the rest mentioned they would prefer, in a real-life situation, to review the process with someone. The 2 exceptions were coded as Both since they had ambiguous answers such as:

> *PC01: "I think I can do it alone, but maybe it's better if somebody has gone through it could help me with it."*

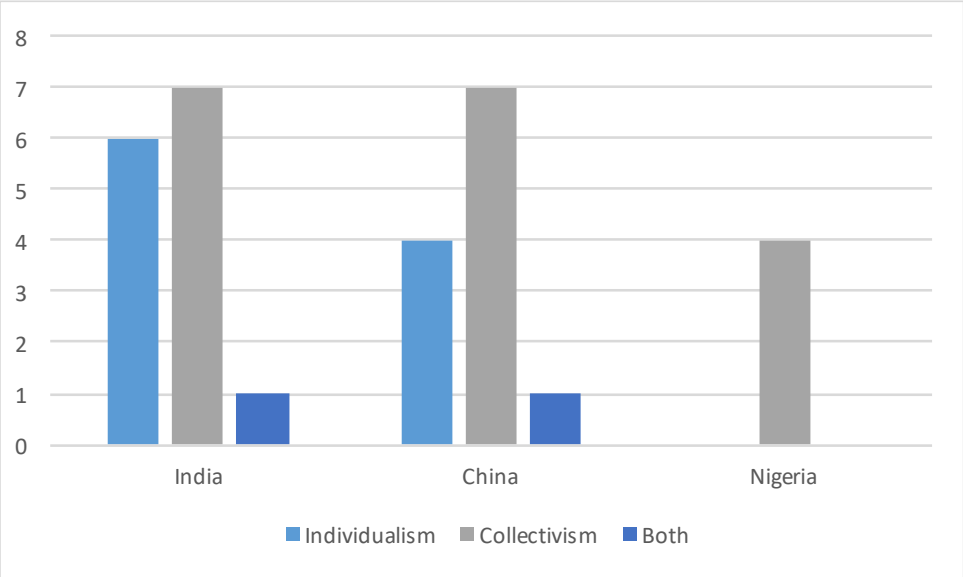



**Figure 12: Number of Individualist/ Collectivist participants between countries**

We found similarities between or results and Hofstede's index scores. Our results correlate with Hofstede's ranking with India being more individualist than China and Nigeria. The only difference we found for this dimension was that according to Hofstede, China and Nigeria have the same score, but our results show we identified more Chinese participants as individualist than Nigerians. Our small sample size for our Nigerian participants might be the cause for this: more participants are needed to evaluate whether this is a trend in our data, or just due to the low number of Nigerian participants.

We investigate further the profiles of the person whom our participants would want to review the process with. We divided the Collectivism theme into 4 categories of persons: Officials, Online support group, Person with previous experience, and Undefined. For this analysis, we discuss the number of references, as our participants could indicate more than one potential option of assistance.

We coded 12 references where participants mentioned they would like to review the process with someone who had prior experience going through the process (5 Chinese participants, 5 Indians, and 2 Nigerians)

> *PI03: "I would like to have a person with experience. Maybe I might take some, I mean clarification and everything and how they went through all the process."*

We coded 7 references where participants mentioned they would prefer to review the process with an official (either from IRCC or from other organisms offering assistance for this kind of process) (2 Chinese participants, 3 Indians and 2 Nigerians).

2 Indian participants mentioned they had used online groups to find information and assistance to go over similar processes already and would do the same for future situations.

> *PI11: From personal experience she used Facebook group to guide herself. She found someone with a similar profile/score that went through a similar obstacle and she helped her overcoming that obstacle about a visa.*

Lastly, 4 Chinese participants mentioned they would like to review it with someone but did not specify whom.

Beside when participants did not specify who they would like to review the process with, the common factor is that participants would like assistance from someone who has more expertise using the website, either a recent user or an official figure. We did not find differences for this preference between the three countries. There were no references where participants mentioned they would like to review the process with a family member or a friend, where we could have interpreted as emotional support.

This gives us insights on the usability of IRCC's website since our participants mentioned a need of assistance in a real-life situation when doing such application process on this website. This means there is a need to design the website better to enhance the experience of the user. A suggestion could be to improve the guidance for the user to navigate more easily on the website and not require assistance.

### 4.2.2 Time Orientation

Since we did not design a specific question to influence our participants to answer with a time element to gather data for the dimension of Time orientation, we were not able to code many references where participants discussed elements of this dimension. We identified 5 participants: 3 Chinese, 1 Indian, and 1 Nigerian for the theme of Short-Term Orientation and we identified 6 participants: 2 Chinese, and 4 Indians for the theme of Long-Term Orientation.

For Short Term Orientation, the most common comments related to saving time through assistance and on how a better display of information could be more efficient:

> *PN02: "I would like to have that person with me so I don't make any unnecessary mistakes and have to come back again."*

> *PC07: "It actually points me to another direction, but it would be better if they can have like hyperlinks like under the things of the other page. So that she can go directly through and she doesn't go for another Google search."*

For Long Term Orientation, the most common comment was on how they would take the time to read carefully the information to go over the process.

In Hofstede's index score ranking for the dimension of Time orientation, China has the highest score over India and Nigeria. Our results show differently with India having the longest time orientation. However, according to Hofstede's score, Nigeria is the country

with the shortest time orientation. Our results show potentially the same with Nigeria having no references for long-time orientation.

The results of the theme of Short-term orientation correlates with our previous results on Individualism/Collectivism, where participants would like assistance to save time and be more efficient. This supports our idea mentioned in the previous section, where the usability of IRCC's website should be improved by designing the website in a way where the navigation is more guided.

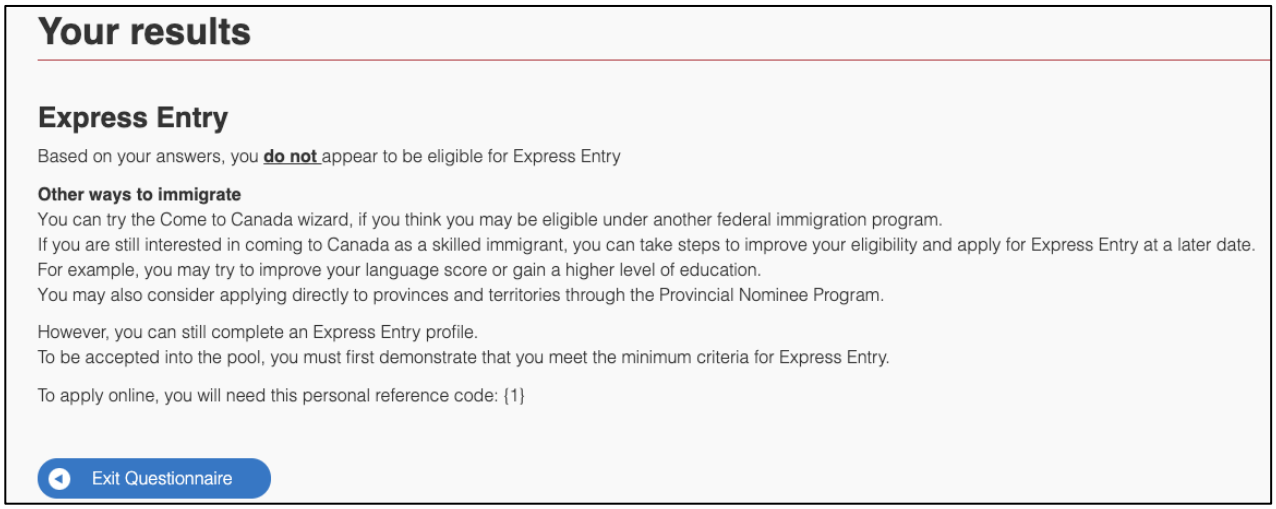
### 4.2.3 Power Distance

We coded the Power Distance dimension by coding the actions of our participants as our references. Action coding consists of identifying all the verbs of action in the participant's answer and list them as patterns later [73]. We did the action coding for one question: "What would you do next?". We included this question in our interview specifically to explore the dimension of Power Distance. We decided to pursue our analysis with action coding because this question requires an answer with action verbs and because participants answer with a list of actions more than elaborating on each action. We considered high Power distance when the participants follow the instructions and suggestions given by IRCC, a low Power distance when the participants take their own alternative.

In Table 6, we present a list of the verbs (references) that we collected and separated into categories. Our first category is "Following Instructions", it reassembles the explicit references where participants mentioned they would follow the instructions, and the references where participants said they would do the same actions as suggested in the answer from the questionnaire (Figure 13).

**Table 6: Action coding for Power distance**

| Follow Instructions | Research | Improve Skills | Ask |
|---|---|---|---|
| • Follow instructions<br>• Improve English score<br>• Apply to program suggested | • Research<br>• Read more<br>• Search information using Google<br>• Check availability | • Apply to a job<br>• Get work Experience<br>• Find job<br>• Improve skills | • Ask someone |



**Your results**

**Express Entry**

Based on your answers, you **do not** appear to be eligible for Express Entry

**Other ways to immigrate**

You can try the Come to Canada wizard, if you think you may be eligible under another federal immigration program.
If you are still interested in coming to Canada as a skilled immigrant, you can take steps to improve your eligibility and apply for Express Entry at a later date.
For example, you may try to improve your language score or gain a higher level of education.
You may also consider applying directly to provinces and territories through the Provincial Nominee Program.

However, you can still complete an Express Entry profile.
To be accepted into the pool, you must first demonstrate that you meet the minimum criteria for Express Entry.

To apply online, you will need this personal reference code: {1}

Exit Questionnaire

**Figure 13: Screenshot of the answer given by IRCC after filling the questionnaire**

Our Following category is "Research" and it reassembles the references that are in link with research such as reading, search using Google, and check for information. The next category is "Improve Skills" and it reassembles any references where the participants said they would take action to improve their skills such as applying for a job and get work experience. Note here that we included "improve language score" in the category of

"follow instruction" since IRCC explicitly suggest this action. Lastly, we have the category of "Ask" which reassemble the references where participants said they would ask for assistance.

We compared the action coding between the three countries and represented the data with a bar chart (Figure 14). Indian and Chinese participants had a high number of participants who relied on doing extra research of information to get to the next step.

> *PI02: "I don't know like Honestly. Like just go online and read more and like figure out what that federal program is with the provincial program."*

Additionally, Indian participants had a high number of participants who were ready to improve their score/personal skills by applying for a job and gain experience on the field.

Lastly, all three countries had a high number of references where participants mentioned they would follow the instructions and suggestions given by IRCC.

> *PN02: "I'll use what they told me here to apply online. And I would use the reference code that was given here. I would also check for IELTS exams and how to improve my score."*

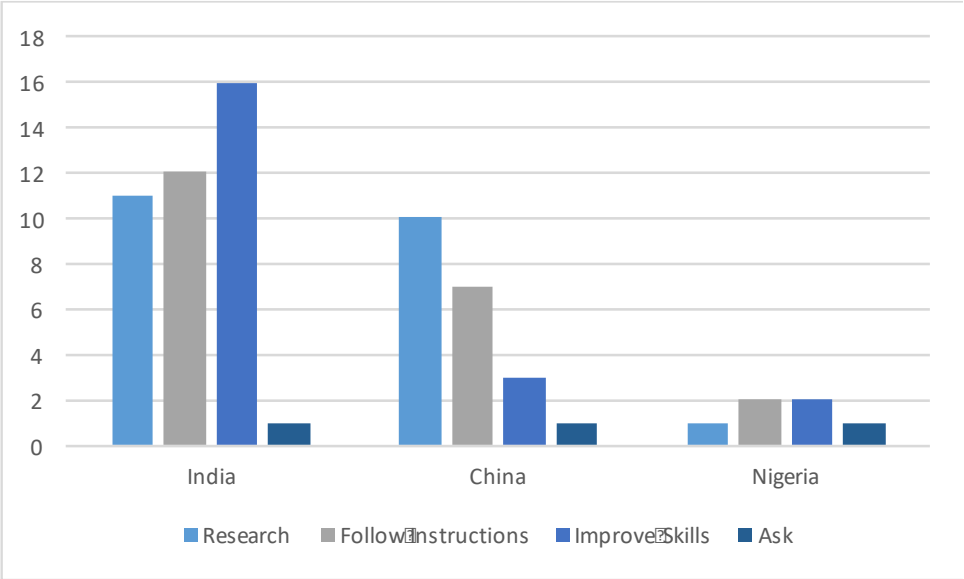



**Figure 14: Number of references for each of the 4 themes identified for PDI coding**

In Hofstede's index score ranking for the dimension of Power distance, China has the highest score with 80 followed closely by India and Nigeria with both having the index score of 77. Our results show potentially the same with Indian, Chinese, and Nigerians having differences and similarities in their answers.

With this analysis we could identify differences and similarities between the three countries. Indeed, our Indian participants demonstrated that they would work on their own person by mentioning they would try to improve their working skills and gained experience as well as doing extra research. They also mentioned, like the two other countries, they would follow the instructions which demonstrates a high-Power distance. Our Nigerian participants also had more references for improving their skills and follow the instructions. Compared to Indians, our Chinese participants mentioned more often they would do more research on their end and follow instructions before working on improving their skills.

In terms of the usability of IRCC's website, we can see from this analysis that participants take different actions given the same instructions. This give us insights that the way the instructions are formulated is not clear for the users to pursue the application process with ease. It can also give us insights on linguistic variables where Indian and Nigerian participants interpreted the instructions as they have to improve their skills, while Chinese mentioned they would have to do some additional research to continue the process which could indicate a misunderstanding of the instructions.

### 4.2.4 Uncertainty Avoidance

This dimension includes themes where the participants commented negatively or positively about IRCC's website and the navigation process. To follow along the description given in Hofstede's key differences [13], we coded the negative comments in "protest" (Weak UAI) and the positive comments in "no protest" (Strong UAI), see Table 7.

**Table 7: Detailed coding for the theme of Uncertainty avoidance**

| Protest | Neutral | No Protest |
|---|---|---|
| • Suggestion<br>• Informative<br>• Wrong info<br>• Explicit dislike | • Positive comment with negative ending<br>• Negative comment with positive ending | • Rational<br>• No dislike<br>• Positive comment |

We coded in total 53 references where participants were protesting against the website and 42 references where participants were not protesting and complimented the website instead, see Figure 15. One reference was attributed per answer which means one participant can have multiple references coded for the same theme because participants were commenting on the website when answering different questions. We added a third theme: "Neutral" with references where participants answered with a negative comment but immediately followed with a positive comment as a middle point in the dimension, since the participants seemed to hesitate about making a negative comment. We present in the next lines the categories of the three themes we have for UAI and accompanied each of them with a representative quote.

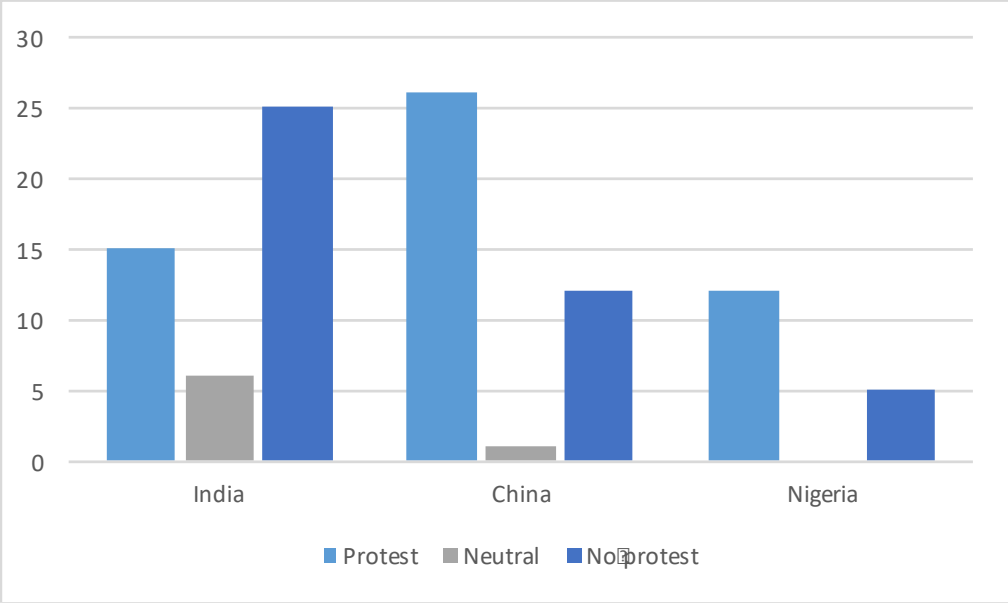



**Figure 15: Number of references for "Protest", "Neutral", and "No protest" by country**

#### 4.2.4.1 References for "Protest"

We coded 21 references where the participants protested on different features of the webpage and added suggestions on what IRCC should do to solve the issue (13 from Chinese participants, 6 from Indians, and 2 for Nigerians).

> *PC02: "There's a lot of stuff in there, but it's like too much information for me so. I was thinking like if there could be a process. In the beginning like 'what's your status' you choose student, you choose worker, you choose PR and you choose citizen then just go to that section and I need to look information about that."*

We coded 17 references where the participants protested specifically about how the webpage is too informative and can be overwhelming (6 from Chinese participants, 5 from Indians, and 6 from Nigerians).

> *PN03: "I think it's kind of centred still around too many unnecessary information like you just go on it. I feel like it could be a lot simpler than it is and easier for someone to follow. Someone coming for the first time could easily get intimidated and then could also end up having the wrong application and you applying for the wrong thing."*

Additionally, we coded 10 references where participants protested about the information being too general and not specific to the case (2 from Chinese participants, 4 from Indians, 4 from Nigerians).

> *PI09: "I don't feel like they have suggested it's entirely correct because they suggest to better improve your language skills. I think the score is pretty much high so it's unnecessary. I feel like they are suggesting the thing which certain things are unnecessary so you can just exclude them. So it's not based on the profile, it's just a general way."*

Lastly, we coded 5 references from 3 Chinese participants where there was an explicit dislike about the webpage:

> *PC05: "I really hate this design!"*

#### 4.2.4.2 References for "No protest"

We coded 13 references where the participants explicitly shared the appreciation for the webpage, mentioning there was nothing they disliked (5 from Chinese participants, and 8 from Indians).

> *PI03: "The website is kind of like user-friendly. Like sometimes the website would be very complex to use, we need some assistance or something. But I find this website is some of user-friendly."*

Additionally, we coded 18 references where participants rationalized the information given by IRCC (4 from Chinese participants, 12 from Indians, and 2 from Nigerians).

*PI02: "I felt that was good. Like it might be because some of the answers that we fed in the system was like also like an indication that these results could be a possibility because like some of the factors like: if she's working, or she has a job offer and stuff like that. Like if you want to come to Canada to like I guess stay longer or study or stuff, like I feel like you need a reason or something. Or like you need prove that you have something going on for you."*

Lastly, we coded 11 references where participants shared explicitly that they had no dislike for the website (3 Chinese participants, 5 Indians, and 3 Nigerians).

*PI04: "Like I said it was easy. It has some things written in bold so I can find it easier. There's nothing that I dislike."*

#### 4.2.4.3 References for "Neutral"

We coded 7 references where participants gave negative comments immediately followed by a positive comment (1 from 1 Chinese participant, and 6 from 4 Indians).

*PC06: "sometimes, maybe the explanation is not, not enough for me to understand very well. I need to ask someone who has experience to explain it to me. But mostly things are very clear."*

In Hofstede's index score ranking for the dimension of Uncertainty avoidance, Nigeria has the highest score with 54 followed by India with 40 and China with 30. Our results show different with India having a stronger uncertainty avoidance and Nigeria having the weakest.

Indeed, our Indian participants were the one who least criticized IRCC's website. When they did they mostly rationalized their thoughts and tried to identify a reason why a certain problem was targeted. This could come back to the idea that participants tempted to be more cautious with their answers during an in-person usability test [34], [35]. Our Chinese and Nigerian participants were the two countries that criticized the most IRCC's website.

This is mostly with the analysis of this dimension that we collected insights from the usability of IRCC's website. We discuss in more details our findings in the discussion in Chapter 5.

### 4.2.5 Summary of cultural results

Our results from our cultural analysis based on Hofstede's cultural dimensions of Individualism/Collectivism, Time orientation, Power distance, and Uncertainty avoidance show the presence of cultural variables between the three countries we studied. We noted that Indian international students were more individualist and less temped to criticize IRCC's website. On the other hand, Chinese and Nigerian international students were more collectivist and had more references criticizing IRCC's website. Furthermore, in our analysis of power distance, participants from the three countries mentioned they would

follow the instructions and demonstrated a high power distance. These results confirm the potential bias that cultural variables can have on usability testing results.

### 4.3 Personality Results

We decided to include the Ten Item Personality Inventory test [69] in our study to explore if the variables in participants' answers varied more because of a cultural and linguistic differences or because of the personality traits of our participants. In Figure 16, we present the number of participants who scored higher in each of the 5 personality traits. We also added combinations of personality traits when participants had the same score for 2 or more personality traits.

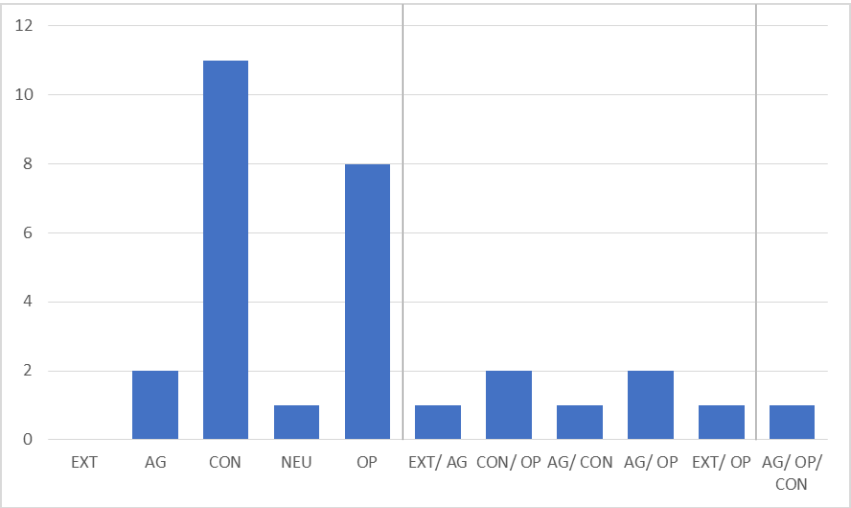



**Figure 16: Number of participants per personality traits (EXT: extraversion, AG: agreeableness, CON: conscientiousness, OP: openness to experience, NEU: neuroticism)**

Since all personality traits except "Conscientiousness" and "Openness to Experience" had only 1 or 2 participants, we decided to pursue our analysis with the 19 participants that

scored in either of these two traits. In Figure 17, we present these 19 participants divided by their countries and personality trait in which they scored higher.

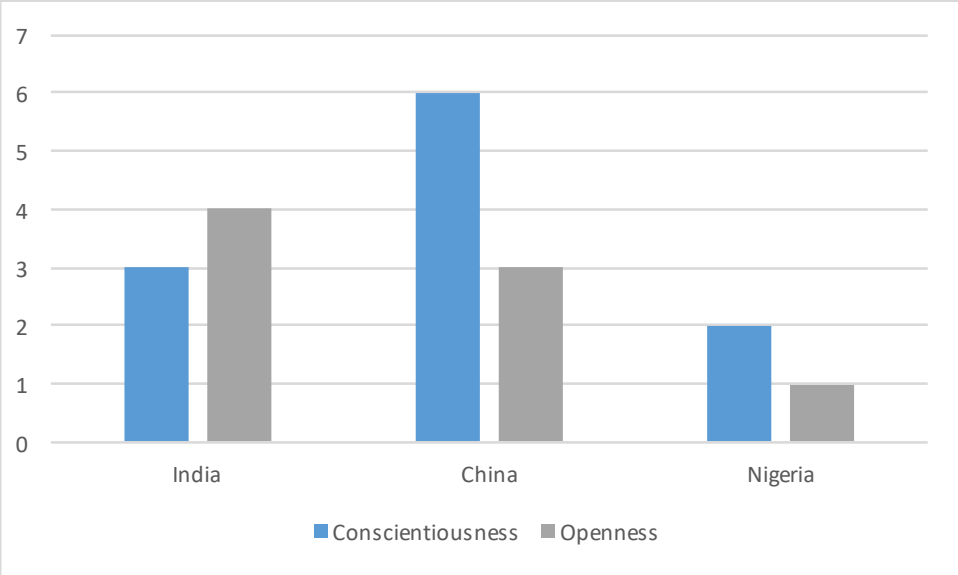



**Figure 17: Conscientiousness and Openness to experience by country**

To compare Hofstede's dimensions between these two personality traits, we looked at the definitions for "Conscientiousness" and for "Openness to Experience." Someone who scored high in "Conscientiousness" is recognized as being self-disciplined and prefers planning things rather than being spontaneous [49]. We could thus interpret that someone who is more conscious would score more as an individualist, with a long-term orientation and a high-power distance.

Someone who scored high in "Openness to Experience" is recognized as someone who takes more risk and is more aware of his/her emotions [49]. Scott et al. [50] found a correlation between openness to experience and uncertainty avoidance influencing the enjoyment of the users. They discuss that a participant with a high score on "Openness to

experience" and a weak Uncertainty avoidance will tempt to score higher in enjoyment. We could thus interpret that someone who is open to experience would score a weak uncertainty avoidance index.

### 4.3.1 Individualism/Collectivism

As can be seen in Figure 18, both personality traits have a higher number of collectivist participants. These results do not correlate with the definition provided earlier mentioning that people scoring high in "Conscientiousness" are more self-disciplined.

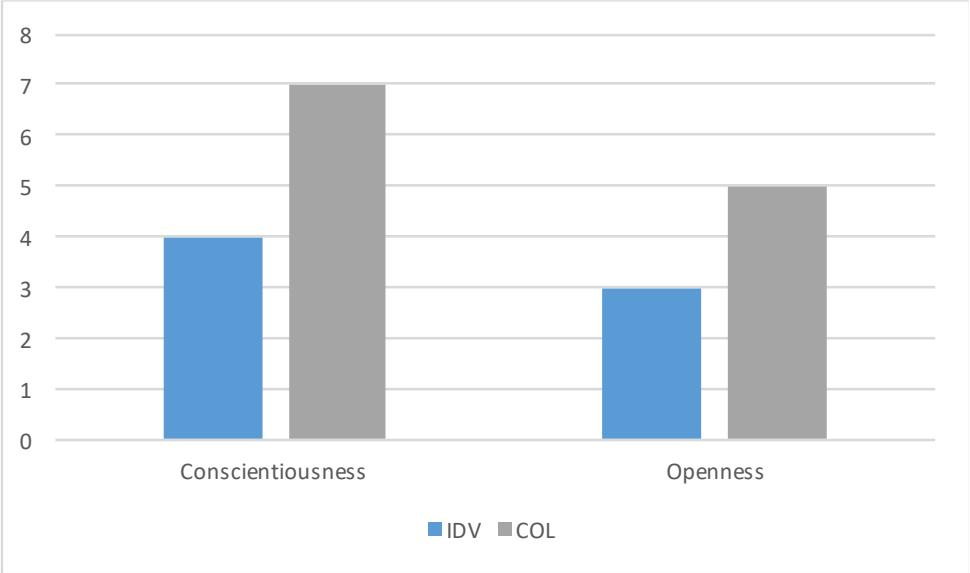



**Figure 18: Number of participants divided by IDV and COL**

### 4.3.2 Uncertainty avoidance

Like Scott et al. [50], we did find a correlation between "Openness to experience" and Uncertainty avoidance. Indeed, as can be seen in Figure 19, there is a bigger gap between the number of references for "protest" and "no protest" in "Conscientiousness" than for

“Openness to experience”. This means participants who scored higher in “Conscientiousness” had stronger Uncertainty avoidance.

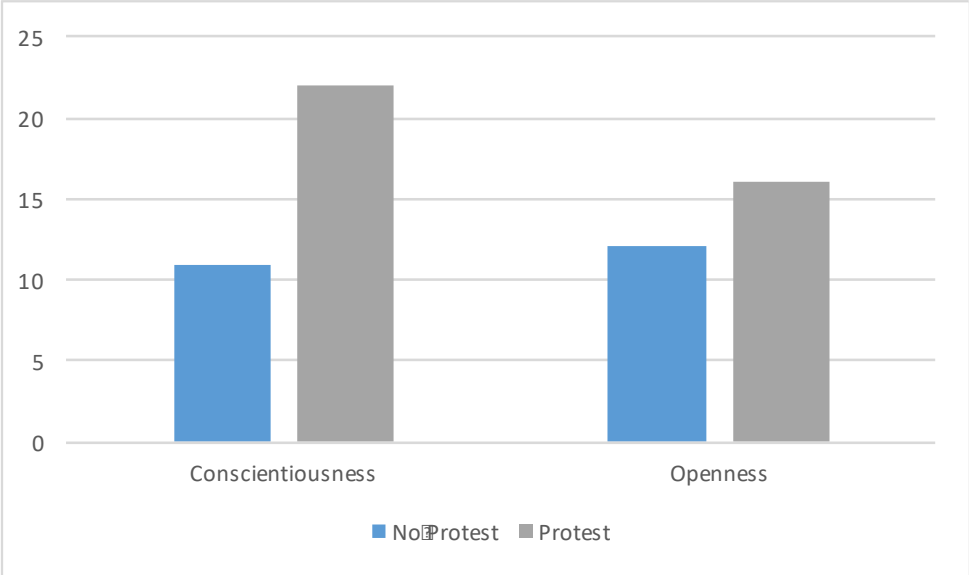



**Figure 19: Number of references coded for UAI divided by personality traits**

### 4.3.3 Summary of personality results

From these 2 analyses, we can conclude that comparing the personality traits from the Big five with Hofstede’s cultural dimensions does not always correlate with one another. Additionally, we have seen with Figure 11 and with Figure 16 that participants do not score high on only one personality trait and the error bars are long and overlapping, which can make it hard to distinguish behaviours and answer patterns between participants. However, these results still give us insights on the importance to acknowledge the potential bias of personality traits in usability testing as we found a correlation between “Openness to experience” and Uncertainty avoidance.

## 4.4 Likert Scale Results

### 4.4.1 Likert Scale Tendencies

Duh and Chen [7] discuss, in their research on cultural variables, that there could be differences in answer tendencies in Likert scales type of surveys. They discuss that the cultural background of an individual could influence the answer tendencies to choose either the extremes of a scale or the midpoints. We decided to include five questions from the system usability scale (SUS) [57] with a 5-point scale to see if we could find differences in the tendencies of answers between the three countries we studied. Additionally, these questions also helped us collect insights from users and their perceptions of IRCC's webpage.

To analyze our results, we calculated the number of times each number between 1 and 5 were selected for each the three countries (Figure 20).

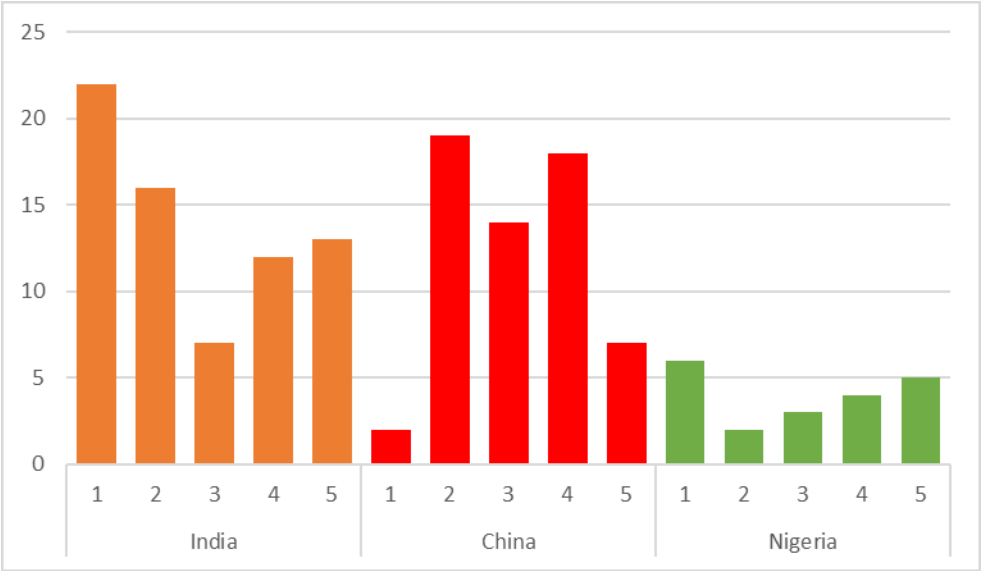



**Figure 20: Likert scale tendencies (frequency for each scale) for India, China, and Nigeria**

As we can see in Figure 20, China seems to have a midpoint tendency having answered 2-3-4 more often than the extremes of 1 and 5. As for India, it seems they are avoiding the specific neutral answering 3 less often than the four other options. It is hard to identify a pattern with our Nigerian participants as their answers seem to be more clustered.

We were interested in exploring cultural variables in Likert scale questions following Duh and Chen's discussion on this matter [7]. For this reason, we decided to also analyze these answers by looking at the questions specifically and see if we could find any patterns of answers. To do so we took the average of answers for each of the questions for each of the country. We show the results in Figure 21.

At first glance, India has the lowest average scores for the questions of complexity and inconsistency, which have negative connotations, and the highest scores for the questions on learnability and confidence which have positive connotations. Moreover, India is the country with the lowest average score for the second question regarding the need of assistance which correlates to our findings in our analysis of the dimension of Individualism/Collectivism where India score higher in Individualism. The average score for the answers of our Chinese and Nigerian participants do not show important visual differences.

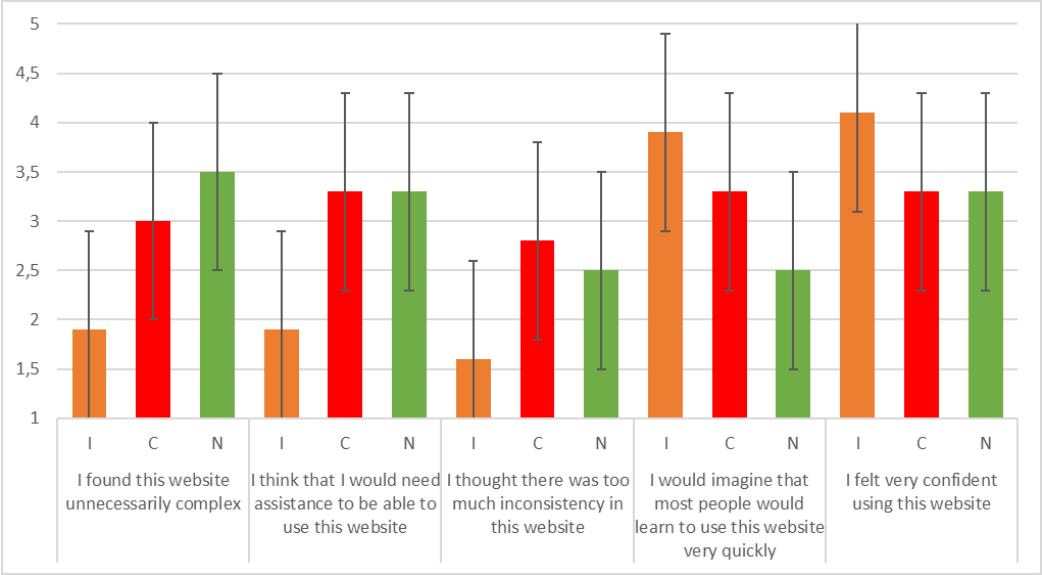



**Figure 21: Likert scale answers for the SUS for India (I), China (C), and Nigeria (N) with error bars representing standard deviation**

### 4.4.2 System Usability Scale of IRCC's Website

In addition to exploring answer tendencies when it comes to Likert Scale, we were also able to gain insights on the perceived usability of IRCC's website from our participants. To do so we calculated the average score of all of our 30 participants for each of the five questions. We show the results in Figure 22. Overall, the highest score was for the quick learnability of the website and for the confidence using the website.

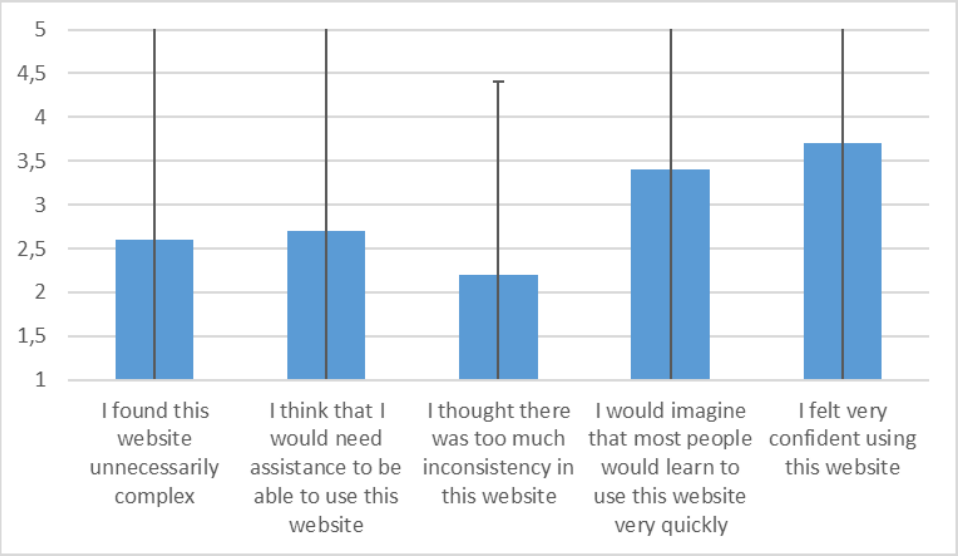



**Figure 22: System usability scale of IRCC's Website with error bars representing standard deviation**

### 4.4.3 Summary of Likert scale results

In this section, we were interested in looking at answer tendencies of our participants when answering Likert scale questions. Our results show that Indians tempt to avoid the neutral option (number 3 on the scale) while Chinese tempt to avoid the extreme options (number 1 and 5 on the scale). We also found a correlation with our previous analysis of the dimension of Uncertainty avoidance where our Indian participants scored higher on the questions with positive connotations and lower on the questions with negative connotations. Moreover, our results also correlate with our finding from our analysis of the dimension of Individualism/Collectivism, where Indians scored lower on the question about the need of assistance.

## 4.5 Linguistic Results

In this section, we were interested in looking at the English proficiency of our participants by looking at their ease regarding the English used by IRCC. We also analyzed if speaking multiple languages can influence the ease of our participants with the English. Lastly, we investigated the different interpretation our participants had for the expression: "how do you feel," since words can have different meanings in different languages.

### 4.5.1 English proficiency

#### 4.5.1.1 Ease with IRCC's English

To explore the linguistic variables in our usability testing of IRCC webpage, we asked our participants two questions regarding the language of the website:

- How did you find the language IRCC use on their website (was it easy to understand/to follow)?
- Was there any time where you had to read again a word or a section more than once to better understand the content/meaning? Do you remember when/which part?

We began our data analysis by scoring the language's "easiness." We identified three themes for this analysis: "Easy," "comfortable," "Difficult." If participants commented that the language was easy to understand in the first question, and did not have to read again a word or a section we coded the participant in "easy" commented the language was hard to understand, but did not have to reread a word or a section we coded the participant in "comfortable." We also coded in "comfortable" participants that mentioned they found the language easy to understand, but that had to read again a word or a section. Lastly, we

coded in “difficult” the participants who mentioned the language was difficult to understand and who had to read again a word or a section. Our results in Figure 23 show that Indian participants had more ease with the English IRCC used on their website. Interestingly, although English is the mother tongue of our Nigerian participants, they scored higher in “comfortable” with the language, like most of the Chinese participants.

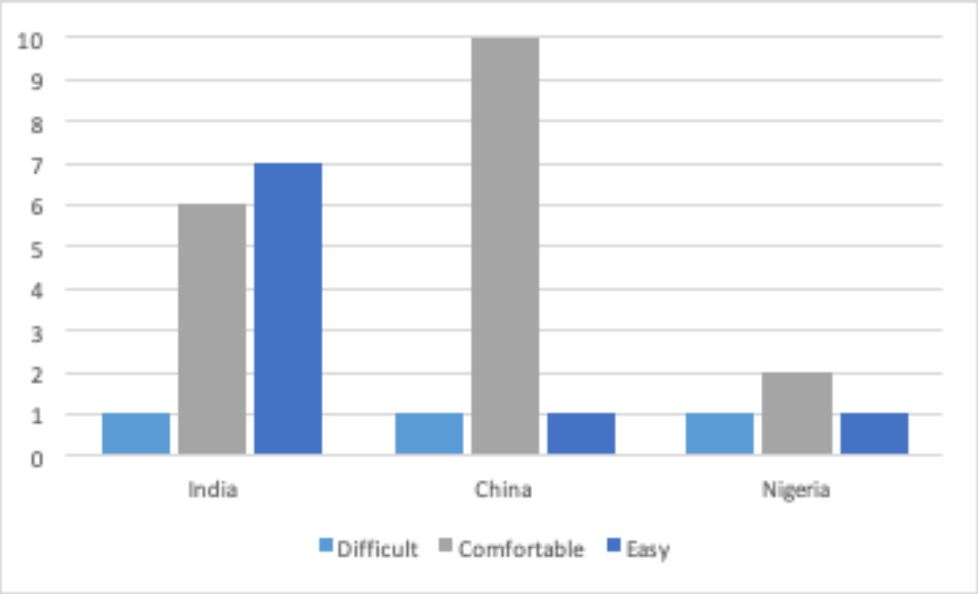



**Figure 23: Number of participants on ease with the English of IRCC by nationality**

#### 4.5.1.2 English proficiency by number of languages spoken

We also explored if speaking multiple language had an effect on the participants ease with the English language IRCC use on their webpage. 18/30 participants (all 3 countries included) were bilingual, speaking their mother tongue and English. 6/30 participants were trilingual: they spoke their mother tongue, English and another language. 6/30 participants were multilingual: they spoke their mother tongue, English and 2 or more other languages.

Our results in Figure 24 suggest that the more languages our participants spoke, the more they found the English used by IRCC was easy to understand.

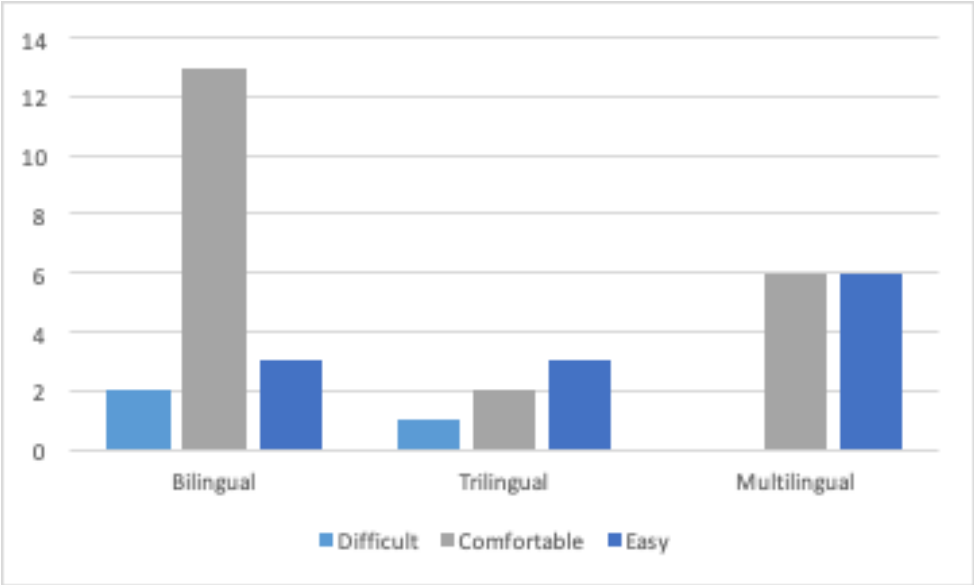



**Figure 24: Language's ease by number of languages spoken**

To confirm this last result discussed, we did the same analysis only looking at our Indian participants since their groups was more equally divided between the 3 categories. 4/14 participants were bilingual, 6/14 were trilingual, and 4/14 were multilingual. Again, the results shown in Figure 25 suggest that the more languages our participants spoke, the more they found the English used by IRCC was easy to understand.

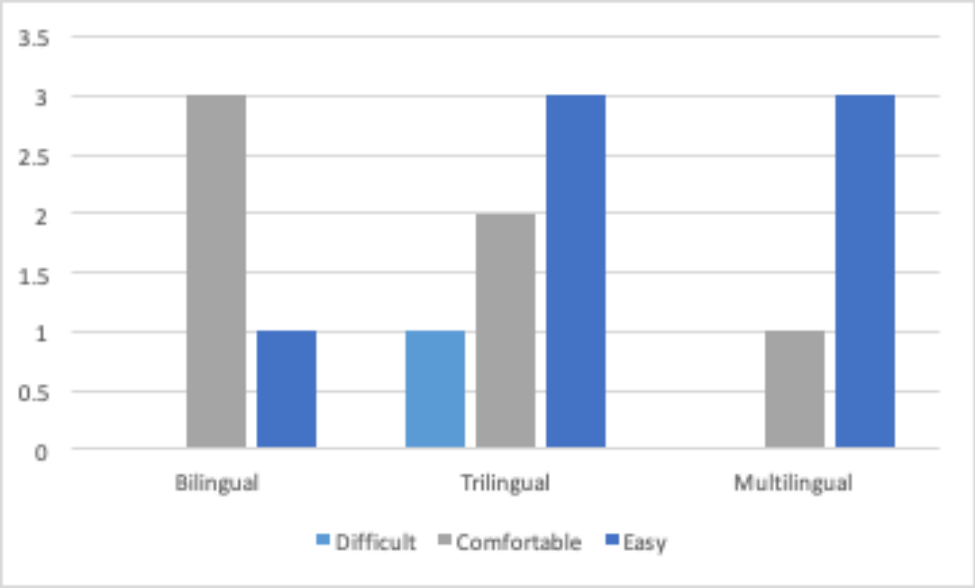



**Figure 25:Language's ease by number of language spoken for Indian participants**

#### 4.5.1.3 Usability of IRCC's English

We also looked at the comments our participants did for these two questions. For the first question, 3 Chinese, 4 Indian, and 1 Nigerian participants gave comments (the other ones answered only by yes or no). The common comment from our Chinese participant was that they found the language somewhat easy to understand but they were aware that something could be improved, one saying it explicitly, another one mentioning that it did not seem that IRCC followed the 8th grade English level but was harder.

> *PC01: "I think it's easy to understand. But I was told that the government of Canada's website would use language only on a grade 8th level or something like that. But I am not sure if this is for grade 8th reading. I don't know, because I don't take like English lessons in this*

*country so I don't know what grade 8th really is, so it could be higher than grade 8th."*

For our Indian participants, the most common theme was that the language is difficult to understand at the initial point of the research but with familiarity and experience on it, it becomes easier to understand with time. The comments from our Nigerian participants were similar to this mentioning the initial navigation is difficult because the website is very informative.

*PN01: "And initially when I entered the website, I wasn't so sure because it seems like it had a lot of things that didn't seem right. So I wasn't so sure of like what to, like where to go because like they have like 2 options and I can't really see much difference between them. So like which one to I go through and so yeah."*

For the second question, more participants commented: 11 Chinese, 6 Indians, and 3 Nigerians. For this question, the 3 groups agreed on 2 two things. Participants across the 3 groups seem to agree that IRCC's website is very informative, thus had to read more carefully to better initiate their search and to better understand what they are reading.

*PC07: "Especially this kind of things you have to be really careful. Because you are coming to this country you are not like."*

Participants also discussed that one part of the questionnaire they had to fill was more complex. The reason was that this part was asking for National Occupational Classification (NOC) work skills and only gave a short description of it and offers a link to more information which brought to a completely new webpage (Figure 26).

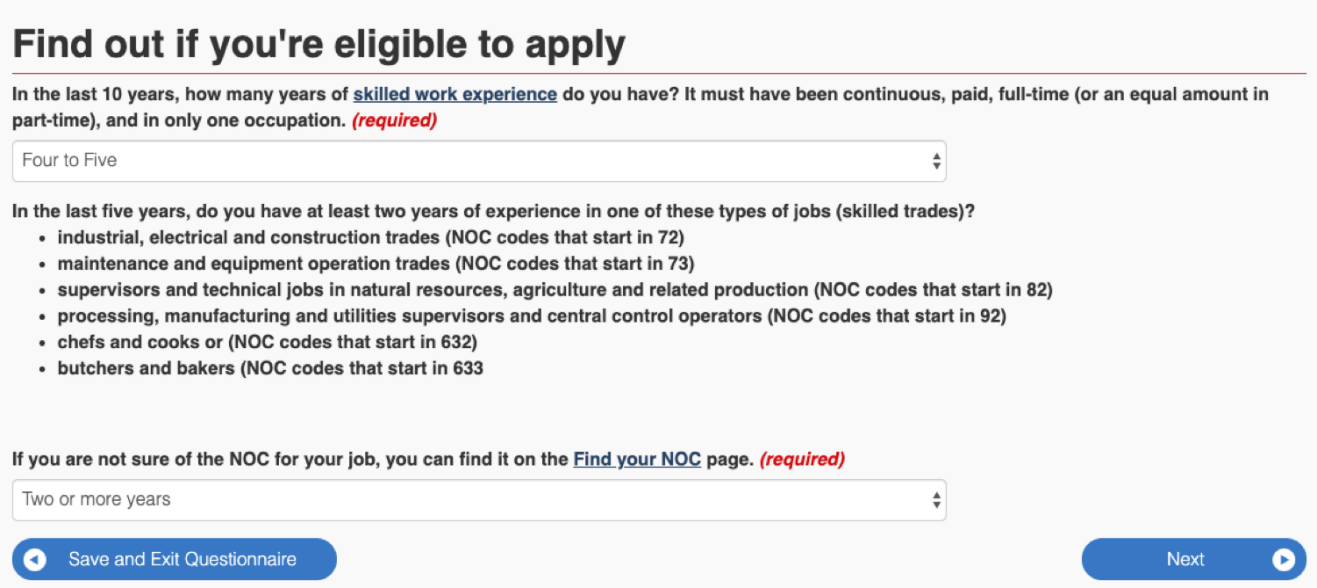



**Figure 26: Screenshot of the question where participants were asked about the National Occupational Classification**

Participants seemed to dislike this aspect saying it felt like a whole new search by its own.

> *PC06: "Well like for the NOC codes because I read that before, because I'm doing my research on how to apply for my immigration status so I know that before. But if I had not read that before maybe I would spend more time on that yeah."*

### 4.5.2 Linguistic variables in interpretation

We pursued our data analysis by looking at the way our participants interpreted the expression, “how do you feel about...?”. In our interview, we had two questions starting with this expression:

- How do you feel about what you just went through?
- How do you feel about the answer Anika got from the questionnaire?

As discussed in our literature review, words and expressions can have different or multiple meanings when speaking in different languages [56]. According to the Cambridge Dictionary [75], the verb “feel” has two definitions in English:

- To experience something physical or emotional.
- To have a particular opinion.

We coded the answers from our participants according to these two definitions. During the process of coding we identified an additional interpretation of the questions which was a descriptive answer. We thus had three codes to analyze our participants’ answers: Opinion, Emotional, and Description. Because each participant had to answer two “how do you feel about” questions, we coded 2 references for each, which means we had a total of 60 references.

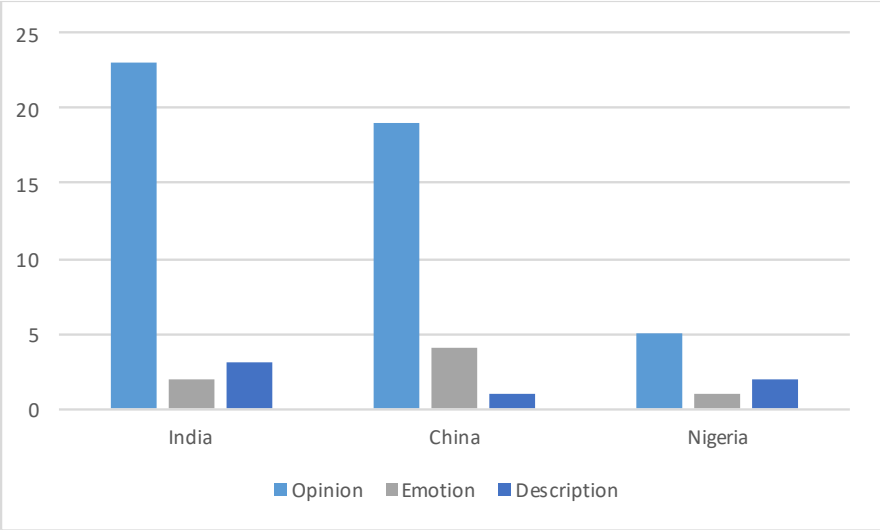



**Figure 27: Interpretation of "how do you feel about" by country**

As can be seen in Figure 27, most of our participants answered the questions by giving their opinion.

> *PI08: "I don't know any of these things so. I think it's okay, they're giving you pretty straight forward answers like okay I need to do this this this."*

We coded 7 references where the participants answered the questions by discussing their emotions. 4 references were from Chinese students, 2 from Indians, and 1 from a Nigerian.

> *PC08: "I am really sad about her. Like to the website she cannot she doesn't appear to be eligible but I think she can have other ways to get a visa maybe. Good for her."*

Moreover, we coded 6 references where the participants answered the questions by giving a description of the situation. 3 references were from Indian students, 1 from Chinese, and 2 from Nigerians.

*PI05: "She didn't appear for the eligible express entry but she needs to improve the IELTS score as well as a higher education. Other way she can apply for the express entry by using the minimum criteria of express entry."*

Lastly, for our linguistic analysis, we observed when our participants were asking to clarify a question during the interview. We coded 17 references from 12 participants where participants asked to clarify the question. 5 participants were Chinese students, 6 were Indians, and 1 was Nigerian. 9/17 of these references were to ask clarification of the two previous questions analyzed in this work: "how do you feel about…".

*PC12: "How do I feel ... Like you mean like easy to use the website or?"*

### 4.5.3 Summary of linguistic results

With our results from the linguistic analysis we can see that linguistic variables can influence the results during usability testing. Indeed, we found that the English proficiency of our participants does not always correlate with the ease of English during a usability test. Indeed, our Indian participants, who had English as their second language, had more ease with the English used by IRCC than our Nigerian participants who all had English as their mother tongue. Moreover, we found that the more our participants were speaking languages, the more ease they had with the English level used by IRCC.

Lastly, we found that using expressions with multiple meaning in an interview or survey can bias the results as some participants can misinterpret the question. In this case we tested the expression "how do you feel" wanting our participants to answer with an

opinion. Although the majority of our participants answered as expected, we still got one participant at least from each country answering the question with an emotion or a description of the task. This is a good reminder that researchers should be careful with their use of words when developing interview and survey questions to make sure they use words and expressions that explicitly states what the researchers are looking from their questions.

# Chapter 5: Discussion

We present our results of a usability test in which we studied cultural and linguistic variables in the context of usability testing with 30 participants who were international students from China (N=12), India (N=14), and Nigeria (N=4). Our results show similarities between Hofstede's index scores in each of the dimensions analyzed in this research. Although our results do not correspond exactly to what Hofstede had, we still found differences in answer tendencies and patterns between the three groups of participants we studied. Our results also differ from our expectations for the linguistic analysis, where Indians participants had more ease with the English used on IRCC's website.

In this section we discuss the profiles of the countries we could identify and the insights these profiles give regarding cultural and linguistic variables during usability testing. We follow with a discussion on Hofstede's index scores and the personality traits. Following this, we continue with a discussion on our analysis for the language and answer tendencies for Likert scale. Lastly, we discuss the usability of IRCC's website from our usability test.

## 5.1 Countries' profiles

From our analysis of the results from our usability testing, we were able to identify differences between the answer patterns in survey interview questions and Likert scale questions for each of the countries. We discuss in this section the profiles we identified for each country. Again, we want to remind that stereotyping behaviours and characteristics

has to be done carefully and with respect and that we acknowledge individual differences within each culture [39].

### 5.1.1 India

From our results, our Indian participants were the one that preferred the most IRCC's website. In our analysis for the dimension of Individualism, India was the country with the most participants who would prefer to pursue a similar process by themselves without the need of assistance. This can be interpreted in two ways: Indian participants are more independent and prefer to resolve problems by themselves and/or Indian participants found the navigation and interactions on IRCC's website easier.

Furthermore, when we look at our results from our analysis of Time orientation, India was the country that had the longest time orientation. As we described in the previous sections, a longer time orientation means that people accept that it takes time to solve a problem and achieve task. This could have had an impact on the fact that our Indian participants were the group that least critiqued IRCC's website with our analysis of the dimension of Uncertainty avoidance and that scored low on the negative Likert scale questions and high on the positive ones.

Moreover, with our analysis of the dimension of Power distance, our Indian participants was the group that was ready to take more actions when we asked them about what they would do next following the answer they got from the questionnaire (Figure 13). Indeed, they were ready to do more research on the website, take actions to look, apply, and gain work experience, as well as following the instruction given by IRCC.

Lastly, we found interesting results when we did our analysis of the language. Indeed, our Indian participants were the country with the more ease with the English level of IRCC. As for their comments, they were mostly discussing about the fact that the initial navigation can be tricky and that they needed to read more carefully to make sure they understand everything.

### 5.1.2 China and Nigeria

An interesting result we found with our analysis on the language ease with the English level used by IRCC, is that China and Nigeria both were "comfortable" with the English. This is interesting as China was identified by the EF English Proficiency Index [52] as a country with a low proficiency in English and Nigeria with a moderate one. Moreover, this index evaluated non-native English speakers from all countries, but Nigeria recognizes English as their official language. Indeed, all of our 4 Nigerian participants mentioned their native language was English. Additionally, in our socio-demographic data, the majority of Nigerian participants self-identified as fluent in English while Chinese participants self-identified as being on the business level. We could not identify which dimension or personality trait could have influenced this result since we coded both countries with very similar score for each.

Indeed, overall, China and Nigeria have similar profiles from our analysis and were the ones who least preferred IRCC's website. Indeed, we identified both countries as collectivist which means they would prefer assistance when doing a similar application process online on this webpage. This correlates with Hofstede's index scores for this dimension where China and Nigeria both had the same score. Furthermore, China and

Nigeria were the two countries in which we coded the most references where participants mentioned they would follow the instructions when we asked them what they would do next following IRCC's questionnaire which demonstrates a higher Power distance. China and Nigeria were also the two countries that critiqued the most about IRCC's website when we analyzed the dimension of Uncertainty avoidance. In terms of the analysis for the dimension of Time orientation, we only coded one reference for Nigeria which was for Short term orientation hence, we could say that Nigeria has a shorter-term orientation compared to China where we coded references for both Short and Long-term orientations. According to Hofstede's index scores for this dimension, China is the country with the highest Time orientation and Nigeria with the lowest.

Where we identified differences between the two countries was with our analysis of the Likert scale tendencies. China appears to have a mid-point tendency having a low number of answers on the extremities of 1 and 5. On the other side, Nigeria appears to have more of an extreme tendency where participants answered with 1 and 5 more often than the mid-point answers.

## 5.2 Languages

We found that Indians participants had more ease than Chinese and Nigerian participants with the English level used by IRCC. We expected our Nigerian participants to have more facilities with the English since they were our only participants with English as their mother language. This result could be in link with our results from Uncertainty avoidance where Indian participants had more references complimenting the website than criticizing it and was the opposite for the Nigerians. As expected with the EF English Proficiency Index

[52], our Chinese participants were the groups with less ease with the English used by IRCC.

Regarding the interpretation of the questions “how do you feel”, the majority of our participants interpreted the questions as we wanted, which was to explore their opinion. We did have a few participants who interpreted the question differently and answered by describing their feelings or by giving a description of what they did. This confirms what Calvet’s [54] work explains that words can have different meanings in different languages. Although the majority of our participants interpreted the questions as we expected them to, we suggest, for future research, to avoid terms with multiple meanings like discusses Behr [56] and use more precise terms, like “think,” in this case, or “what is your opinion” instead of “how do you feel.”

We also found that the more languages our participants spoke the more ease they had with the English. This could be the explanation why our Indian participants were the group with the most ease with the English level used by IRCC. They were the group with the most multilingual individuals. Moreover, as discussed in our population rational, Indians are used with the vehicular languages and to associate different contexts with different languages [54]. If we associate this with the findings of Billestrup et al. [76] where they discuss the level of Internet expertise might be a bigger influencer, we can explain why our Indian participants had more facility with the English and overall satisfaction with the website.

This can be insightful for the client experience team of IRCC regarding the usability of their website. We had participants mentioning the initial navigation can be complicated. Additionally, like our participant PC01 mentioned, it is unclear if the government always

follows the 8th grade English level recommendation [4]. This can potentially affect negatively the experience of individuals from countries with lower English proficiency [52].

### 5.3 Insights on Cultural and Linguistic Variables in Usability Testing

From our analysis of our usability test results, we were able to identify differences in the answers between the three countries of India, China, and Nigeria. We also found differences between our results and Hofstede's index score in terms of which country had a higher level of a dimension for instance India having a stronger Uncertainty avoidance in our results when in Hofstede's index score, Nigeria scores higher than India. Chien et al. [48] had a similar situation with their study and explained that this could be due to their participants' differences in aspects like ages and education background.

The work of Billestrup et al. [76] could be a better explanation as they did not find significant differences between the experience of their users across gender, age, and academic background. Instead, they explain that the results might differ more with the different level of Internet experience, which we did not evaluate in our study.

Other studies included a personality trait analysis to their cross-cultural analysis to see if the differences could be explained by them [49], [50]. This is for this reason that we decided to include the personality test and analyze if the personality of individuals has more weight on the participants' answers and behaviour than their cultural background. Our results for this analysis did not correlate with the descriptions of the personality traits either. One thing that could explain these results is that the differences between the score of each personality traits for each participant were low, which can make it hard to

distinguish behaviours and answer patterns between participants. Additionally, Scott et al. [50] explains that only 9.3% of the variance credited to human factors can be analyzed by looking at the personality and cultural traits of the participants. Although their research was to explore this aspect for perceived quality and enjoyment, this percentage could be insightful for other usability attributes as well, such as satisfaction or ease of use.

### 5.3.1 Recommendations

Hofstede studied these dimensions in the context of the workplace and may not completely transpose in the context of usability testing. We believe that Hofstede's cultural dimensions are still a good tool to inform researchers about potential cultural biases when interacting with users from multiple cultural backgrounds. The cultural dimensions can inform what aspect of a usability test can be influenced by specific dimensions. However, we suggest using the interpretation of the task results as guidelines instead of precise values.

Indeed, we suggest researchers to use these guidelines when developing the methodology of their usability tests. Our results show that Indian participants did not criticize the website as much as the participants from the two other countries. Since in usability testing the objective is to find the higher number of issues in the product tested, we recommend to develop questions to influence participants to criticize more or to ask on specific aspects of the webpage instead of general questions such as "how did you find the website?"

Our results also show that Chinese participants tempted to avoid the extremes of 1 and 5 on a 5-point Likert scale survey while Indians seemed to avoid the neutral position

of 3. We suggest using a larger scale, for instance a 7-point scale, to attenuate these different answers tendencies.

We believe that the best strategy attenuating these differences to ensure the reliability of research and usability testing protocols and results would be to recruit participants from multiple cultural and linguistic backgrounds to gather a general ideation of the usability. It is unclear how many participants from different cultural and linguistic backgrounds would make the perfect sample, since our results show that our Indian participants differed more from our Chinese and Nigerian participants in terms of answer tendencies. In the same way researchers try to recruit the same number of males and females [38] or from different groups of age [30], we suggest to recruit participants from different cultural and linguistic backgrounds.

In terms of consistency and reproducibility of testing protocols and results, we suggest using basic and clear terms in questionnaires and surveys given during the usability test. This will help diminish the potential linguistic bias when participants have different levels of English or any other language the usability test is processed in.

Our results are also a good indication of potential bias when reporting results from studies done with only one cultural and linguistic group. Indeed, like we have seen with our results, Indian participants did not criticize the website as much as the Chinese and Nigerian participants. Researchers should be aware of this bias when reporting results and when they want to recreate a usability test with a different cultural group of users, in the same direction where words have different meanings in different languages [54].

## 5.4 IRCC's Website's Usability

Besides studying cultural and linguistic variables in usability testing, our study also allowed us to gather comments and insights regarding IRCC's website. When looking at our results from our analysis of the dimension of Individualism/Collectivism our results show that the majority of our participants from all three countries would prefer to go through an application process of IRCC with the assistance of someone. The most preferred assistance was from someone who had experience going through a similar process. Moreover, some participants who mentioned they would like assistance from someone also mentioned it would also help to save time on the website.

This could also be explained with our analysis of the dimension of Uncertainty avoidance when we looked into the critics of the participants. We coded 16 references where participants complained about the website being too overwhelming and informative. Although we did not specifically study the cultural differences in design preferences of interfaces like in [7], [38], [44], [45], we did not find differences between countries for this comment having 6 Chinese, 5 Indians, and 5 Nigerians mentioning this aspect. These insights could suggest that the website is not enough as user-friendly as the designers of the website from IRCC might think. Which comes back to Hillier [10] discussing the bias of the designers designing with their own cultural and linguistic backgrounds and might not always satisfy the targeted users, in this case, clients from different countries.

When we looked at our results from our analysis of the dimension of Power distance, we can see that not all the participants wished to follow the instructions and suggestions given by IRCC. Like 10 of our participants mentioned, some suggestions that were given at the end of the questionnaire did not correspond to the specific profile of

Anika. Particularly at the part where IRCC suggests improving the language score. The score we gave Anika for the International English Language Testing System (IELTS) test were high:

- Speaking: 8.5
- Listening: 9
- Reading: 8
- Writing: 9

This could explain why we had a high number of participants who did not mention they would follow the instructions and suggestions given in the answer from the questionnaire. Maybe a recognition system of data entry could be implemented to better inform their clients according to their specific profile when they answer these types of questionnaires online.

Lastly, we reiterate our suggestion that IRCC follows the definitions and interpretation of the cultural dimensions as guidelines more than the index score directly when studying users from different countries.

## 5.5 Limitations

### 5.5.1 Participants' limitations:

For this research we were only able to recruit 4 international students from Nigeria. This makes it a small sample size [27], [28] to analyze the data and to compare with our two other groups of participants with 12 and 14 participants. The ideal scenario would have been to have the same number of participants from each country to better compare the data.

Having more participants from this country could have helped us draw a better profile for Nigeria.

Another limitation we had regarding our participants was the number of countries we analyzed in this research. We only compared three countries which had similar index scores for Power distance and for uncertainty avoidance. In future research it could be interesting to compare countries with bigger differences in the index scores to see if the differences correspond better with Hofstede's index scores or not.

Furthermore, Hofstede's index score and our results do not take into consideration the cultural diversity within each country. Indeed, multiple languages are spoken within India [66]. This applies to all countries we studied. Further investigation would need to be done to see if our participants' answers are influenced by these different backgrounds to draw a better profile for each of the regions of one country.

As previously discussed, we only recruited international students for our study since they already had experience using IRCC's website but were not as experienced as someone who did a permanent residency or a citizenship application process. We acknowledge having different level of expertise on the website could have influenced the results on the number of criticisms said for instance [76]. Additionally, our participants were, for the majority, enrolled in graduate programs, which indicates a higher education level than most applicants for residency in Canada [77]. This level of education could also have biased the results since, as graduate students, they may find easier to understand complex situations hence had more ease navigating the webpage. Graduate students also develop their critical minds which could have influenced the amount and types of criticisms

given about the website. Again, it is important to acknowledge differences within each country such as the different cultural groups, languages, and socio-economic status.

### 5.5.2 Study limitations:

As mentioned in our literature review, there are multiple methodological and socio-demographic biases when it comes to usability testing. Our main researcher for this study who did all the usability testing was a French Canadian. Our results could be biased if we consider the work of Vatrapu and Pérez-Quiñones [16] who found that participants seemed to give more feedback and feel more comfortable when the researcher is from the same nationality than them. Additionally, although our results show that China and Nigeria had more references that critiqued the website than complimented, our results could be biased if we look at the work of Dell et al. [17] where they found that participants preferred and complimented more a product when the researcher was foreign. Our Indian participants had more references that complimented the website, which could be a result of having a foreign researcher.

Because our objective was to study cultural and linguistic dimensions, we did not consider comparing our results between other socio-demographic variables such as the gender identities of our participants. We acknowledge these elements could have influenced the results [38]. Moreover, as mentioned in our review of literature, we did not study the dimension of Masculinity since gender studies contradict his work [41]. Indeed, countries like Canada now accept that individuals identify themselves as Gender X, also known as non-binary [78]. Although we did not explore this bias since our interests were on the cultural and linguistic bias, this brings new opportunities to explore this socio-

demographic bias of gender identities in usability testing beyond the typical male and female repartition of participants.

Another limitation related to this is that we only had one gender identity for our persona “Anika” that was female. Having a male persona for our participants who identified as male could have influenced their answers as the persona would have been more representative of them [21].

We understand the website of IRCC is a large interface with multiple links directing their clients to the service they want to have access to. We concentrated our study with only one small part of the website. Since we made our participants start their navigation from the home page, we had to give them some directions on what links to select. We provided our participants with written instructions on which information to look for, but sometimes our participants were navigating the website more with their instincts than with the instructions. This sometimes made our participants selecting wrong links and thus the researcher had to guide them back to the right page where they could continue their navigation. There is a possibility that these redirections could have affected the thoughts and feelings of our participants about the website when answering the questions from our interview survey.

Another limitation in our study was regarding our interview survey. We designed the questions in our survey to trigger answers related to only one aspect of Hofstede’s definitions of the dimensions. For instance, when asking our participants what they would do following the answer from the questionnaire they filled, we expected an answer related to the dimension of power distance, but specifically looked for the aspect of the subordinate is told what to do or not. In his work there is more than this aspect when looking at the

description of power distance. A solution to counter this problem for further research would be to develop more than one question with multiple aspects of each of the dimensions so we have a better idea of the participant's profile on the dimensions.

A related limitation was for the dimension of Time orientation. We did not ask a specific question targeting this aspect and were looking into all the answers from our participants to identify time elements instead. To better analyze this dimension, we should have developed questions targeting different aspects of this dimension.

# Chapter 6: Conclusion and Future Work

This thesis explored cultural and linguistic variables in the context of usability testing. We designed and conducted a usability test of IRCC's webpage with international students from India, China, and Nigeria for this exploration. We present in this chapter the conclusion and the future work for this thesis.

## 6.1 Conclusion

With our usability tests, we identified cultural and linguistic differences between the three countries we studied. These differences were based on cultural dimensions (Individualism, Time orientation, Power distance, and Uncertainty avoidance) defined by Geert Hofstede [13], on personality traits from the Big Five [47], on the system usability scale [57], and on languages spoken. The objective of this study was to explore cultural and linguistic variables during usability testing and use our findings to inform user experience researchers of these potential biases.

We conducted usability tests with 30 international students from India, China, and Nigeria to identify their differences in their answers tendencies and usability preferences when investigating IRCC's website. We structured each test the same way: Socio-demographic and personality survey, user testing of the website, system usability scale survey, and short interview.

The results from our cultural analysis showed differences between the three countries and with Hofstede's index scores. Our Indian participants demonstrated more satisfaction and ease of use regarding the usability of IRCC's website while our Chinese and Nigerian participants demonstrated less satisfaction. We identified different answers

tendencies in Likert scale questions which were in link with the dimension of Power distance. These answers our research question of identifying cultural variables in usability testing and what strategies to explore these variables. Hofstede's cultural dimensions are good concepts that can be used to explore cultural variables but the index scores from his work are not always accurate depending of the usability context.

The results from our linguistic analysis demonstrates that participants had more ease with the English level used by IRCC's on their website when they spoke multiple languages. During their navigation, participants experienced difficulties with the English level at the initial navigation of the website and familiarized gradually with the English with time. This informs about the use of languages in usability testing and answers our second research question.

## 6.2 Future work

Our results show that the cultural and linguistic background of users can influence their answers in usability testing. In our observations we saw differences with the satisfaction on the usability of a webpage and on answer tendencies. While this work was conducted only in English with international students from India, China, and Nigeria, the insights can extend to provide support to all user experience researchers in the process of developing usability tests.

Future work includes the possibility to explore cultural and linguistic variables with other countries and linguistic background. In addition to the ease in English, we intend to pursue studies in other languages to better explore linguistic variables during usability testing. We already have plans to pursue our work by doing the same usability test in

French with international students from other countries. These additional studies would be crucial to go beyond the analysis of the users cultural and linguistic backgrounds, to address the gap between what the users really think and what they share with the researchers.

# Appendices

## Appendix A Ethical Clearance


Office of Research Ethics
503 Robertson Hall | 1125 Colonel By Drive
Ottawa, Ontario K1S 5B6
613-520-2600 Ext: 4085
ethics@carleton.ca

**CERTIFICATION OF INSTITUTIONAL ETHICS CLEARANCE**

The Carleton University Research Ethics Board-B (CUREB-B) has granted ethics clearance for the research project described below and research may now proceed. CUREB-B is constituted and operates in compliance with the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2).

**Ethics Protocol Clearance ID:** Project # 110528

**Research Team: Joanie Ouellet (Primary Investigator)**
Dr. Audrey Girouard (Research Supervisor)

**Project Title:** Cultural and Linguistic Variables in Usability Testing

**Funding Source** (If applicable):

Effective: **March 26, 2019** Expires: **March 31, 2020**.

**Please ensure the study clearance number is prominently placed in all recruitment and consent materials: CUREB-B Clearance # 110528.**

***Restrictions:***

This certification is subject to the following conditions:

1. Clearance is granted only for the research and purposes described in the application.
2. Any modification to the approved research must be submitted to CUREB-B via a Change to Protocol Form. All changes must be cleared prior to the continuance of the research.
3. An Annual Status Report for the renewal of ethics clearance must be submitted and cleared by the renewal date listed above. Failure to submit the Annual Status Report will result in the closure of the file.If funding is associated, funds will be frozen.
4. A closure request must be sent to CUREB-B when the research is complete or terminated.
5. During the course of the study, if you encounter an adverse event, material incidental finding, protocol deviation or other unanticipated problem, you must complete and submit a Report of Adverse Events and Unanticipated Problems Form, found here: https://carleton.ca/researchethics/forms-and-templates/

Failure to conduct the research in accordance with the principles of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans 2ndedition* and the *Carleton University Policies and Procedures for the Ethical Conduct of Research* may result in the suspension or termination of the research project.

Upon reasonable request, it is the policy of CUREB, for cleared protocols, to release the name of the PI, the title of the project, and the date of clearance and any renewal(s).

Please contact the Research Compliance Coordinators, at ethics@carleton.ca, if you have any questions.

**CLEARED BY:** **Date: March 26, 2019**

[redacted]

Bernadette Campbell, PhD, Chair, CUREB-B

[redacted]

Natasha Artemeva, PhD, Vice-Chair, CUREB-B

## A.1 Consent form

**Title:** Cultural and Linguistic Variables in Usability Testing
**CUREB-B Clearance #:** 110528
**Funding Source**: NSERC DG CUResearch
**Date of ethics clearance**: 03-26-19
**Ethics Clearance for the Collection of Data Expires**: 03-31-20

I _____, choose to participate in a study exploring variables of preferences and comments in a usability testing of a webpage. The study aims to compare these variables among international students from India, Nigeria and China. The lead researcher is Joanie Ouellet in the School of Information Technology, under the supervision of Dr. Audrey Girouard.

**The experiment:** The researcher is asking participants to navigate a webpage with given instructions and to answer questions following the navigation.

**Participants:** must be at least 18 years old, and comfortable in using the English language. Be an Indian, Nigerian or Chinese international student (part-time/full time, undergraduate/graduate). Participation is voluntary. Participants will receive $10 as compensation for their participation in the study.

**Data collection and use:** We will collect data through a socio-demographic survey, a personality survey consisting of 10 7 points likert scale questions, a 5 5 points likert scale questions on usability on a tablet, and audio recorded answer to a semi-structured interview. Audio will only be captured with the participant's consent during the semi-structured interview at the end of the session. If participants do not consent to be audio recorded, the researcher will take written notes of the interview. Electronic Data will be stored on a password-protected computer at Carleton University. None of your personal information will be associated with the stored data, data collected during your session will be associated with a coded ID (e.g., P01). Only recordings intended for publication, which has been edited to remove identifying features, will be moved to cloud storage. Once the project is completed, all research data will be archived indefinitely and potentially used for other research projects on this same topic.

**Risk to participants:** We do not anticipate any risks to participants. If at any time you feel uncomfortable in any way, please inform the researcher who will stop the session.

**Withdrawal:** Participation is entirely voluntary and at your discretion. If at any time during the session you choose to withdraw from the study, for any reason, you may do so. Any information collected will be discarded. It is not possible to withdraw after the session has completed, because data is not associated with your name.

If you would like a copy of the finished research project, you are invited to contact the researcher to request an electronic copy which will be provided to you.

The ethics protocol for this project was reviewed by the Carleton University Research Ethics Board, which provided clearance to carry out the research. Should you have any ethical concerns with the study, please contact Dr. Bernadette Campbell, Chair, Carleton University Research Ethics Board-B (by phone: 613-520-2600 ext. 4085 or by email: ethics@carleton.ca).

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Carleton University
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Do you agree to participate in this study: ___Yes ___No

Do you agree to be audio-recorded in this study: ___Yes ___No

Signature of participant_____ Date_____

Signature of researcher_____ Date_____

## A.2 Questionnaires

# Usability Testing of a Webpage

Title: Cultural and Linguistic Variables in Usability Testing
CUREB-B Clearance #:
Date of ethics clearance:
Ethics Clearance for the Collection of Data Expires:

Please answer the following questions to the best of your knowledge. This will help us better understand your response to the other questionnaires. Do not include your name anywhere in the questionnaire. Please feel free to leave blank if you prefer not to answer any questions.

* Required

1. **Participant ID (to be filled by researcher)** *

_____

## Socio-demographics

2. **What is your gender?**
*Mark only one oval.*

- ( ) Female
- ( ) Male
- ( ) Prefer not to say
- ( ) Other: _____

3. **How old are you (in number of years)?**

_____

4. **What is your current level of education?**
*Mark only one oval.*

- ( ) Undergraduate
- ( ) Masters Student
- ( ) Doctorate Student (PhD)
- ( ) Other: _____

5. **What is your nationality?**
*Mark only one oval.*

- ( ) China
- ( ) India
- ( ) Nigeria
- ( ) Other

6. **What is your native language?**

_____

7. **What other language(s) do you speak?**

_____

8. **How do you consider your ability in English?**
*Mark only one oval.*

- Beginner level
- Conversational level
- Business level
- Fluent level
- Other: _____

## Ten-Item Personality Inventory

Here are a number of personality traits that may or may not apply to you. Please select a number for each statement to indicate the extent to which you agree or disagree with that statement. You should rate the extent to which the pair of traits applies to you, even if one characteristic applies more strongly than the other.

## I see myself as:

9. **Extraverted, Enthusiastic**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | | | | | | | | Strongly agree |

10. **Critical, quarrelsome**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | | | | | | | | Strongly agree |

11. **Dependable, self-disciplined**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | | | | | | | | Strongly agree |

12. **Anxious, easily upset**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | | | | | | | | Strongly agree |

13. **Open to new experiences, complex**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | | | | | | | | Strongly agree |

14. **Reserved, quiet**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

15. **Sympathetic, warm**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

16. **Disorganized, careless**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

17. **Calm, emotionally stable**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

18. **Conventional, uncreative**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

## System Usability Scale

For each of the following statement, mark one box that best describes your reaction to the website today.

19. **I found this website unnecessarily complex**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

20. **I think that I would need assistance to be able to use this website**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

21. **I thought there was too much inconsistency in this website**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

22. **I would imagine that most people would learn to use this website very quickly**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

23. **I felt very confident using this website**
*Mark only one oval.*

| | 1 | 2 | 3 | 4 | 5 | |
|---|---|---|---|---|---|---|
| Strongly disagree | ◯ | ◯ | ◯ | ◯ | ◯ | Strongly agree |

**Appendix B : Study Scenario**

"Anika is finishing her Master degree here at Carleton university and her student visa will expire soon. She is considering to extend her stay in Canada by applying for a work permit. To find out information on the process she goes on the main page of the Immigration, Refugee, and Citizenship Canada."

- Go on the main page of IRCC

On please share with the researcher all the words/ section you have difficulties to understand.

- Find the link where she can read information about a student work permit
- Navigate the entire page and look for the link for her to find information about changing her conditions and extending her stay in Canada.

"Reading the information page that she landed on, Anika observes that there is a chance for her to be able to apply online. Find out if she is eligible to apply online."

**Demographics for the questionnaire on eligibility for online application**

Like to do in Canada: Work
How long she is planning to stay: permanently
Code on passport: IND (India) – CHN (China) – NGA (Nigeria)
Current country of residence: Canada
Family member in Canada: No
Date of birth: 22-02-1992

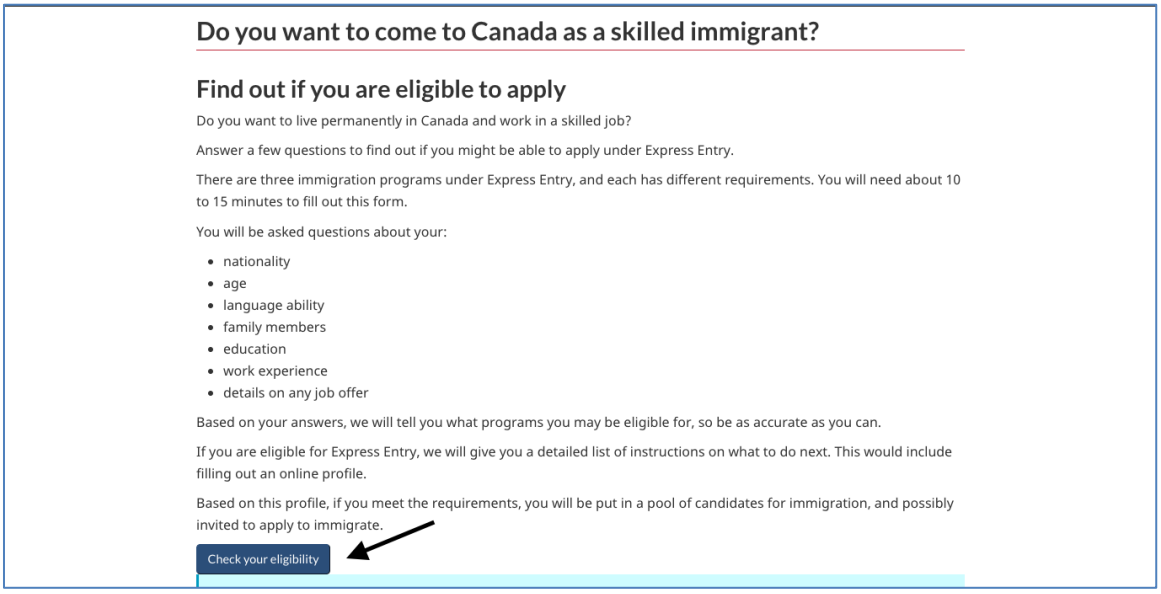
- Press "*Continue*"

Main reason to come to Canada: Find a permanent job
*Results: Express Entry (might be eligible for)*

- Press "*Continue*"

Province or territory of interest: Ontario
English test taken: IELTS
Date the test was taken: 07-07-2017
Score on the test:
Speaking: 8.5
Listening: 9
Reading: 8
Writing: 9
Other language test results: none
How many years of skilled work experience in Canada: None
NOC most experience in: None of the above
In the last 10 years how many years of skilled experience: 4-5
In the past 5 years: 2 or more years
Certificate of qualification form: No
How much money will bring in Canada: 12 475$ - 15 530$
How many family members: 4
Valid job offer in Canada: no
Currently legally working in Canada: No
*Results: do not appear to be eligible for express entry*

## B.1 Serie of screenshots of the pages participants navigated

## Services and information

**My application**
Sign in or create an account, check application status and processing times, find forms, pay fees, and learn about medical and police checks

**Visit**
Find out if you need a visa to visit, do business or transit through Canada, and how to extend your stay as a visitor

**Immigrate**
Find out what immigration programs you can apply for, sponsor your family and use a representative

**Get answers to your questions**
Find quick and direct answers to frequently asked questions in our Help Centre

**Work**
Apply for or extend a work permit, learn about International Experience Canada and being a caregiver, get your credentials recognized, and hire foreign workers

**Study**
Apply for or extend a study permit or student work permit

**Citizenship**
Apply for, resume or give up Canadian citizenship, prepare for the citizenship

**New immigrants**
Get a permanent resident card, find immigrant services in your area, apply for

## Most requested

- Sign in or create an account to apply online
- Check your application status
- Check application processing times
- Find an application form
- Pay your fees
- Find out if you need an eTA or a visa to visit Canada
- Have questions? Find answers in the Help Centre

## Contact us

- Find out how to contact us

Français

Government of Canada | Gouvernement du Canada

Search IRCC

MENU

Home > Immigration and citizenship > Immigrate to Canada > Immigrate through Express Entry

## How Express Entry works

Express Entry is an online system that we use to manage applications for permanent residence from **skilled workers**.

### Step 1: Find out if you're eligible

There are two ways to find out if you're eligible for a program that is part of Express Entry:

- answer a few questions to see if you meet the minimum requirements
- read the detailed requirements for each program

### Step 2: Get your documents ready

You need documents, such as language test results, to show that you're eligible for Express Entry. Some documents take a long time to get, so you should get them ready now.

- Get the documents you need

### Step 3: Submit your profile

Your Express Entry profile is where you give us information about yourself.

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## Find out if you're eligible to apply

**What would you like to do in Canada?** *(required)*

Work

**How long are you planning to stay in Canada?** *(required)*

Permanently

**Select the code that matches the one on your passport.** *(required)*

IND (India)

**What is your current country/territory of residence? If you are presently in Canada, you should select Canada.** *(required)*

Canada

**Do you have a family member who is a Canadian citizen or permanent resident and is 18 years or older?** *(required)*

No

**What is your date of birth?** *(required)*

1992 | February | 22

Save and Exit Questionnaire | Next

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## Find out if you're eligible to apply

**What is your main reason to want to come to Canada?** *(required)*

Find a permanent job in Canada

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## Your results

Based on the information you provided, the result(s) below indicate(s) whether you may be eligible to come to Canada.

### Express Entry

You might be eligible for Express Entry, which includes the following federal economic immigration programs:

- the Federal Skilled Worker Program
- the Federal Skilled Trades Program
- the Canadian Experience Class

Continue

Exit Questionnaire

**Important:** This information is for reference only and no immigration decision will be made based on your answers. If you choose to apply, your application will be considered by an immigration officer in accordance with the Immigration and Refugee Protection Act, without regard to any outcome you attain through this questionnaire. Read the full notice

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## Find out if you're eligible to apply

**Which province or territory do you plan to live in?**

**If you don't know yet, choose the province or territory you are most interested in.** ***(required)***

Ontario

Save and Exit Questionnaire

Next

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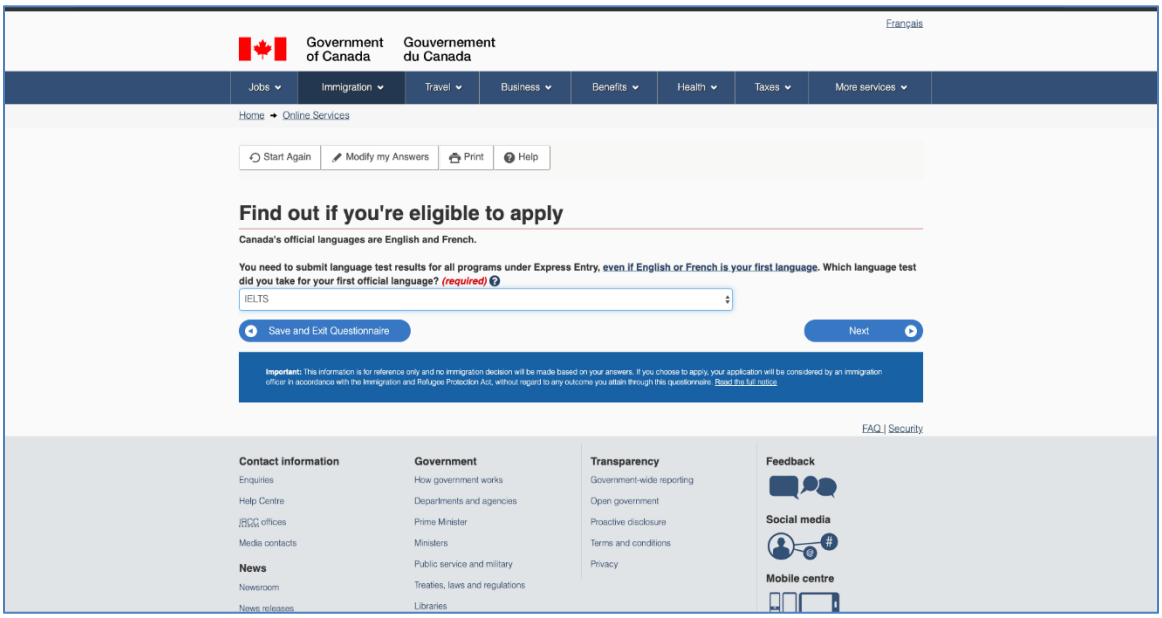
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Find out if you're eligible to apply
Canada's official languages are English and French.
You need to submit language test results for all programs under Express Entry, even if English or French is your first language. Which language test did you take for your first official language? (required)
IELTS
Save and Exit Questionnaire
Next
Important: This information is for reference only and no immigration decision will be made based on your answers. If you choose to apply, your application will be considered by an immigration officer in accordance with the Immigration and Refugee Protection Act, without regard to any outcome you attain through this questionnaire. Read the full notice
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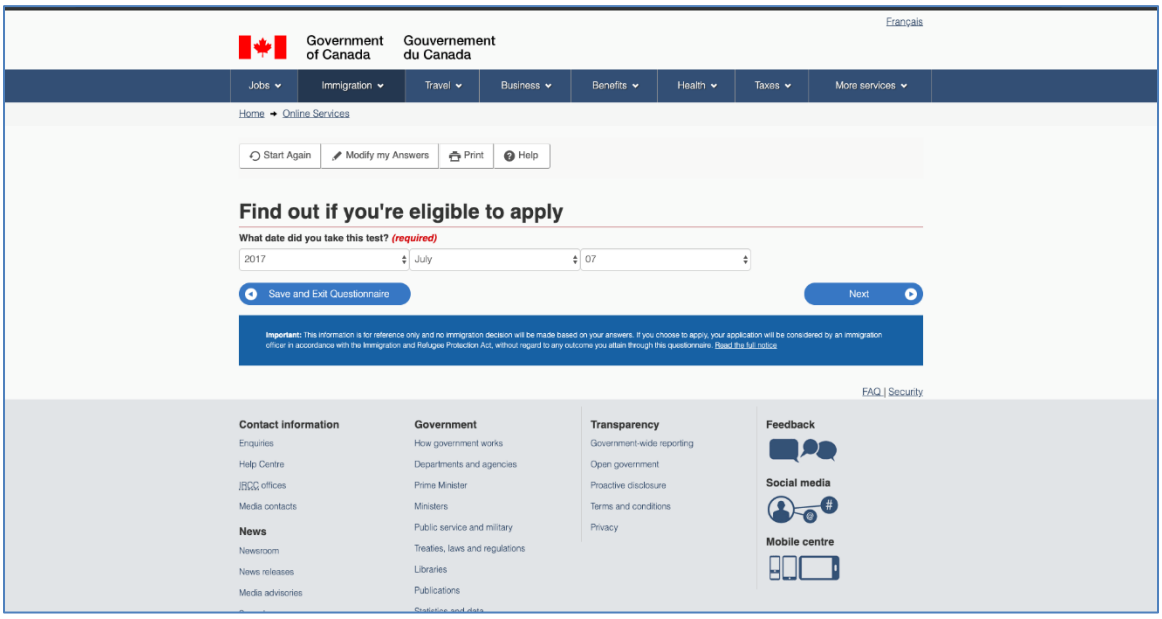
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Help
Find out if you're eligible to apply
What date did you take this test? (required)
2017
July
07
Save and Exit Questionnaire
Next
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## Find out if you're eligible to apply

**Enter the test score for Speaking.** *(required)*

8.5

**Enter the test score for Listening.** *(required)*

9

**Enter the test score for Reading.** *(required)*

8

**Enter the test score for Writing.** *(required)*

9

Save and Exit Questionnaire | Next

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## Find out if you're eligible to apply

**Do you have other language results? Which language test did you take for your second official language?** *(required)*

None

Save and Exit Questionnaire | Next

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## Find out if you're eligible to apply

**In the last three years, how many years of skilled work experience do you have in Canada? It must have been full-time (or an equal amount in part time). *(required)***

None

**During this period, which National Occupation Classification (NOC) level is most of the experience in?**

**If you do not have any Canadian work experience during this period, please choose "None of the above". *(required)***

None of the above

Save and Exit Questionnaire | Next

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## Find out if you're eligible to apply

**In the last 10 years, how many years of skilled work experience do you have? It must have been continuous, paid, full-time (or an equal amount in part-time), and in only one occupation. *(required)***

Four to Five

**In the last five years, do you have at least two years of experience in one of these types of jobs (skilled trades)?**

- **industrial, electrical and construction trades (NOC codes that start in 72)**
- **maintenance and equipment operation trades (NOC codes that start in 73)**
- **supervisors and technical jobs in natural resources, agriculture and related production (NOC codes that start in 82)**
- **processing, manufacturing and utilities supervisors and central control operators (NOC codes that start in 92)**
- **chefs and cooks or (NOC codes that start in 632)**
- **butchers and bakers (NOC codes that start in 633**

**If you are not sure of the NOC for your job, you can find it on the Find your NOC page. *(required)***

Two or more years

Save and Exit Questionnaire | Next

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## Find out if you're eligible to apply

**Do you have a certificate of qualification from a Canadian province or territory in your skilled trade?** *(required)*

No

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## Find out if you're eligible to apply

**How much money (in Canadian dollars) will you bring to Canada?** *(required)*

12,669 - 15,771

**How many family members do you have?** *(required)*

4

Save and Exit Questionnaire | Next

**Important:** This information is for reference only and no immigration decision will be made based on your answers. If you choose to apply, your application will be considered by an immigration officer in accordance with the Immigration and Refugee Protection Act, without regard to any outcome you attain through this questionnaire. Read the full notice

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## Find out if you're eligible to apply

**Do you have a valid job offer in Canada? *(required)***

No

Save and Exit Questionnaire | Next

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## Find out if you're eligible to apply

**Are you currently working legally in Canada? *(required)***

No

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# Your results

## Express Entry

Based on your answers, you **do not** appear to be eligible for Express Entry

**Other ways to immigrate**

You can try the Come to Canada wizard, if you think you may be eligible under another federal immigration program.
If you are still interested in coming to Canada as a skilled immigrant, you can take steps to improve your eligibility and apply for Express Entry at a later date.
For example, you may try to improve your language score or gain a higher level of education.
You may also consider applying directly to provinces and territories through the Provincial Nominee Program.

However, you can still complete an Express Entry profile.
To be accepted into the pool, you must first demonstrate that you meet the minimum criteria for Express Entry.

To apply online, you will need this personal reference code: {1}

Exit Questionnaire

**Important:** This information is for reference only and no immigration decision will be made based on your answers. If you choose to apply, your application will be considered by an immigration officer in accordance with the Immigration and Refugee Protection Act, without regard to any outcome you attain through this questionnaire. Read the full notice

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