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Numbers and Images: Representations of Immigration and Public Attitudes about Immigration in Canada

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Abstract

Perceptions of numbers (numerical estimations of migrant flows) and mental images (beliefs about characteristics and motives of immigrants) have been shown to be important predictors of cross-national immigration attitudes. However, this finding has seldom been verified in Canada. As a result, we know little about how Canadians estimate the amount and type of migrants coming into the country, what drives the generation of these numbers and images, and what the consequences of numerical estimations and mental images of immigration are for public attitudes toward immigration. Using nationally representative cross-sectional survey data from 2019, this article reports that Canadians generally overestimate the number of refugees and asylum-seekers coming into the country but are comparatively less prone to overestimating the overall number of immigrants. Canadians also rely on mental images about the reasons for immigrating to Canada that diverge from the realities of Canada's immigration program. We document how reliance on these numbers and images is driven by the type of media consumed, feelings of threat, and individual-level characteristics of Canadians. In doing so, this article demonstrates that mental images strongly influence Canadians' attitudes toward immigration; numerical estimates also matter, but less so. Furthermore, perceptions of the number of migrants arriving affect latent preferences toward immigration—such as ethnocentrism, perceptions of "threat," and border insecurity—while mental images shape both preferences for lowering immigration intake and latent preferences.

Résumé

Il a été démontré que les perceptions des chiffres et des images sont des prédicteurs importants des attitudes transnationales en matière d'immigration. En utilisant les données d'une enquête transversale de 2019 représentative à l'échelon national, cet article indique que les Canadiens surestiment généralement le nombre de réfugiés et de demandeurs d'asile mais sont comparativement moins enclins à surestimer le nombre d'immigrants qui entrent au pays. Les Canadiens se fient également à des images sur les

raisons d'immigrer qui divergent des réalités du programme d'immigration du Canada. Nous documentons la façon dont la confiance dans ces chiffres et ces images est déterminée par le type de médias consommés, les sentiments de menace et les caractéristiques individuelles des Canadiens. Ce faisant, cet article démontre que les images influencent fortement les attitudes des Canadiens à l'égard de l'immigration, tandis que les estimations numériques comptent également, mais moins. Les chiffres ont une incidence sur les préférences latentes concernant l'immigration, telles que l'ethnocentrisme, les perceptions de la « menace » et l'insécurité aux frontières, tandis que la représentation par l'image façonne les préférences pour la réduction de la population des nouveaux immigrants ainsi que les préférences latentes.

When thinking about immigration, citizens rely both on assumptions about the size of immigrant populations in their country or region and on mental images of the characteristics and composition of these groups. The prevailing wisdom stemming from the academic literature is that the public is generally prone to poor numerical estimation, with a significant number overestimating migrant flows (Sides and Citrin, 2007; Alba et al., 2005; Blinder and Schaffner, 2020). Similarly, public opinion on immigration is informed more readily by images or "pictures of immigration," which are related to empirical aspects of immigration but are coloured by an individual's attitude toward and prior beliefs about migrants (Blinder, 2015). This combination of overestimation and misrepresentation tends to place downward pressure on attitudes toward migration (Blinder, 2015). And given the thermostatic (adjusting for "more" or "less," but not by precise amounts) relationship between public opinion and public policy (Soroka and Wlezien, 2010), numerical and image-based understandings of immigration may be tied to changing immigration policies.

This article considers the sources and consequences of numerical and image-based understandings about immigration intake in Canada. We argue that estimations of population size and preconceived images of immigrants' characteristics are critical components of attitudes toward immigration. In Canada, there is ample research that illustrates the largely positive attitudes toward migrants over the past several decades (Banting and Soroka, 2020; Bloemraad, 2011). However, there is more work to be done concerning Canadians' perceptions of the numbers of different types of migrants (immigrants, refugees and asylum-seekers) coming into the country and how these perceptions might be linked to attitudes about immigration more broadly in Canada (though see Borwein and Donnelly [2021] and Herda [2020] for important exceptions). Moreover, while scholarship on the representation of immigration and immigrants in Canadian political discourses is abundant (see Lawlor and Tolley, 2017; Wallace, 2018), less is known about the mental images that Canadian citizens carry and rely on to form their opinion about immigration. This article explores these critical dimensions of immigration attitudes in Canada by asking three questions: (1) How do Canadians estimate the size of the different components of immigration flow (immigrants, refugees,

asylum-seekers), and what motivations do they envision to be driving immigration? (2) What factors drive numerical estimations and images of immigration flows in Canada? and (3) What are the consequences of numerical estimations and preconceived images of immigration for Canadians' attitudes toward immigration?

Using data from a nationally representative cross-sectional survey fielded in 2019, we answer these questions by engaging in a multi-step analysis. In relation to salient administrative and political categories used in Canada, we explore how Canadians estimate the number of immigrants coming in annually and how they envision the reasons for immigrating to Canada. We show that Canadians generally overestimate the number of refugees and asylum-seekers coming into the country but that their estimates of the overall number of immigrants are closer to reality. We also document how Canadians hold diverse impressions of the reasons why people immigrate to Canada and that these images diverge from the reality of Canada's immigration inflows. We then show that citizens' estimations of the size of inflows and of the reasons for migration inflows are affected by a combination of media consumption habits, feelings of threat, and individual-level characteristics. We further document that images of immigration matter more than numbers, when it comes to Canadians' attitudes toward immigration. While estimates of the size of immigration inflow do not appear to influence preferences about immigration intake, our analyses show that numbers influence latent preferences regarding immigration. Images about the reason for immigrating to Canada, however, shape both preferences for lowering immigration intake and latent preferences.

In addition to documenting the numbers and images that Canadians currently rely on when thinking about immigration, this article makes two important contributions to the study of immigration and public attitudes in Canada. First, we test our hypothesized connections between numerical and image-based understandings of immigrants in Canada using contemporary data from a dataset designed for this type of analysis. In doing so, we confirm that numerical estimates and associated anxieties about the size of immigrant inflows appear less salient for the Canadian public than they may be in other regions of the world. Second, we conduct an analysis that properly tests the disaggregated and differential effects of salient administrative categories such as immigrants, refugees and asylum-seekers on preferences toward immigration. Like many other studies in this area, our study notes the potential for opinion to vary along these identity lines, particularly in light of increased media attention on refugees and asylum-seekers in Canada. By showing that these categories create perceptions that have consequences for attitudes, our analysis demonstrates the importance of taking into consideration the signals produced by institutions and immigration regimes on the formation of citizens' preferences in this policy area. Consequently, our results have implications for the study of attitudes toward immigration in Canada and for the maintenance of public support for the country's immigration program.

Immigration in the Contemporary Canadian Context

Canada has been long known as a country with a welcoming immigration policy, largely centred on economic migration. The majority of migrants are admitted through one of Canada's many economic streams, including the federally run

Express Entry and provincial sponsorship through the Provincial Nominee Program. Both programs consider applications on multi-factor criteria, including work experience, credentials, age and linguistic ability. Fewer than 40 per cent of migrants are admitted through non-economic grounds, such as family reunification or refugee relocation programs. A separate stream admits students for short-term periods of study, though these can be translated into permanent residency through the Post-Graduation Work Permit Program.

In February 2022, Immigration, Refugees and Citizenship Canada (IRCC) announced the government's 2022–2024 immigration plan with an expected 431,645 permanent migrants welcomed to Canada in 2021, increasing to 451,000 in 2023. The majority (approximately 60%) of these individuals will come through economic-class programs (Canada, 2022). The last time Canada welcomed this large a population of migrants was before the First World War. Within these estimates for 2022, approximately 100,005 will come through Canada's Family Reunification Program and a further 84,795 will be admitted through the country's Refugee, Protected Persons, Humanitarian and Compassionate Grounds programs.[1] These numbers increase to approximately 113,000 for family reunification and to 70,250 for humanitarian immigration by 2024. IRCC cites the negative economic and fiscal impacts of Canada's aging population and low birth rate as the reason for the acceleration of migration rates.

Public opinion toward immigration in Canada has generally been positive (and resiliently so) since the 1980s (Banting and Soroka, 2020). While the COVID-19 pandemic that engulfed the globe from 2020 onward placed downward pressure on migration numbers, it did not dampen public support for immigration in Canada. Survey data from Environics' 2021 Focus Canada poll (Neuman, 2021) show that a majority of Canadians view immigration as a net economic positive and key to building our population. Equally as remarkable is the precipitous decline in individuals agreeing that "too many refugee claimants are not real refugees" from the late 1980s to present day, as well as the number of individuals who support increased intake from conflict areas. These factors do not represent the small, but sometimes vocal, undercurrent of anti-immigrant sentiment in Canada. While explicit negative attention toward migrants tends to be episodic and only institutionalized in smaller political parties, such as the People's Party of Canada, support for such voices increased from 1.6 per cent of the national vote in the 2019 federal election to nearly 5 per cent of popular vote support in the 2021 federal election.

This combination of a relatively generous (per capita) immigration program coupled with a comparatively friendly national attitude toward migration policy places Canada in a unique global position, both generally (Bloemraad, 2012) and potentially, vis-à-vis the numerical and image-based understandings of immigrants. Considering that innumeracy about immigration has been associated with increased prevalence of views of immigrants as threatening (Semyonov et al., 2004; Alba et al., 2005), we might expect a country with consistent and, indeed, growing favourable public opinion toward immigrants and migration policy to demonstrate higher levels of accuracy in estimating migration. Similarly, given the relatively high levels of community diversity in large and small Canadian cities, we may anticipate that Canadians' understanding of migration conforms with *who* is actually migrating.

Positive sentiment toward immigration suggests that Canadians might have reasonably accurate numerical and compositional understandings of migration in Canada.

Existing evidence on the matter is conflicting. Borwein and Donnelly (2021) show that Canadians have reasonably accurate knowledge of their immigration system, and they argue that knowledge of the official selection criteria, such as the system's discrimination against older immigrants and those with chronic illnesses, increases support for Canada's immigration policy. On the other hand, using data from the 2009 TATIS survey, Herda (2020) finds that Canadians overestimate the flow of immigrants by 15 percentage points. These conflicting findings point to the need to better understand how numerical estimations and image-based understandings affect the way Canadians think about domestic immigration.[2]

Numbers and Images

Information asymmetry is a central dimension of immigration politics (Freeman, 1995) and influences opinion formation. Despite the growing diversification of societies, only a small portion of citizens have direct experiences with the immigration system or close contacts with immigrants, with most only experiencing the diffuse consequences of immigration policy changes. Researchers have confirmed that symbols and information about immigration are important contributors to development of feelings of threat and competition toward immigrants (for good overviews, see Hainmueller and Hopkins, 2014; Turgeon et al., 2019; Sides and Citrin, 2007). Numerical and qualitative representations of minority populations —including of immigrants—have long been identified as antecedents of overall attitudes toward these groups (Nadeau et al., 1993; Alba et al., 2005; Wong, 2007). Therefore, we expect that the numbers and images that citizens hold when picturing the distant reality of immigration affect and shape opinion, especially when citizens lack experience with recent immigrants.

To date, representations of immigrant population size and its characteristics, as factors that precipitate attitudes, have been studied in two different but complementary ways. Building on the insights of group threat theories and research about estimation of minority population size, a first area of research focuses on how citizens overestimate the numerical size of the immigrant population, a phenomenon sometimes described as "innumeracy" (Herda, 2013). Despite differences in operationalizing measures of immigrant population,[3] a robust finding of this research is that citizens tend to overestimate the number of immigrants in their countries and that overestimation is associated with negative feelings about immigration (Blinder and Jeannet, 2018; Hopkins et al., 2019; Citrin and Sides, 2008; Sides and Citrin, 2007). This finding holds even when considering specific subgroups of immigrants and different national contexts (Blinder and Schaffner, 2020; Grigorieff et al., 2020; Herda, 2010, 2013; Semyonov et al., 2004; Díaz McConnell, 2022).

Another approach has focused on the image-based representations of immigration held by respondents. From this perspective, these "unstated understandings among members of the public of what the word 'immigrants' means, and who it represents" act as the foundations of preferences and of decisions about immigration (Blinder, 2015: 80). In dialogue with public-opinion and psychology research,

this approach suggests that image-based understandings are heuristics that allow individuals to form opinions about issues or themes about which they have limited experience or information (Schwarz, 1998; Blinder, 2015; Herda, 2015). Researchers have shown that the public rely on images of immigration and immigrants that depart from the realities of their home country. For example, they may imagine most immigrants coming to their country to claim asylum, while the reality is that a large majority comes for economic reasons. In addition to documenting the mismatch between compositional aspects of state-sanctioned migration and that which is imagined by the public, this approach has shown that specific images of migrants are associated with negative or positive attitudes toward immigration.

Sources of numerical estimates of immigration have been well documented. Overestimation of the size of immigrant populations has been associated with low frequency of media consumption, specific media framing of migrants and exposure to particular media sources—especially television and tabloid news (Herda, 2015; Nadeau et al., 1993; Blinder and Jeannet, 2018; Meltzer and Schemer, 2021). Strong feelings of threat toward minorities and political affiliation with right-leaning parties also increase the propensity to overestimate the size of immigrant populations (Herda, 2010, 2015, 2020). In line with the information asymmetry and the contact hypothesis (Allport, 1954), spatial context and relationships with immigrants and minorities also appear to matter for the development of numerical estimates. The local proportion of visible minorities and immigrants has been shown to be associated with overestimation, while respondents having direct contact with immigrants (for example, as friends or co-workers) tend to underestimate the size of immigrant populations (Herda, 2013; Alba et al., 2005; Nadeau et al., 1993). National factors matter too; countries with higher gross national product (GNP) and larger immigrant populations tend to underestimate migration levels (Herda, 2013: 224). Finally, successive studies have shown that gender (female), age (younger respondents), low levels of education and demographic context (rural) are typically associated with overestimation. These same drivers have not yet been tested when it comes to commonly held images of immigration.

These two bodies of work point to the importance of considering the question of "how many" and "who" citizens imagine when answering questions about immigration and the consequences of these understandings. Aside from work conducted by Herda (2020) with data from the first decade of the 2000s, this question has not taken into consideration the specificities of recent immigration, and it has yet to be taken up in Canada. As a result, current research cannot ascertain whether and how numbers and images contribute meaningfully to Canadians' contemporary attitudes toward immigration.

Hypotheses

To explore the impact of numbers and images on attitudes toward immigration, we seek to assess how Canadians estimate the size and categorization of different components of immigration flows (immigrants, refugees, asylum-seekers) and the images that Canadians rely on when thinking about immigration, using categories that are administratively and politically salient in Canada. Using this information, we consider factors that influence numerical and image-based understandings

among Canadian respondents. Finally, we consider the consequences of numbers and images on Canadians' attitudes toward immigration. Our concern is not on whether Canadians "get it right" but instead with exploring the forms, sources and consequences of these representations, while taking into consideration the specificities of the Canadian immigration context (Lawlor and Paquet, 2021; Besco and Tolley, 2019; Bloemraad, 2012).

As suggested above, extant studies indicate that Canadians tend to overestimate the size of immigrant population (Herda, 2020) but that they have some knowledge of the process by which immigrants are selected (Borwein and Donnelly, 2021). However, these studies do not provide empirical justifications for expectations about the size of refugee and asylum-seeker populations. Based on this work and on comparative research on immigration innumeracy, we anticipate that Canadians will overestimate the number of immigrants coming into the country across politically and administratively salient categories. Because of Canadians' relative knowledge of the immigration program (Borwein and Donnelly, 2021) and because of the strong institutional signals provided by the Canadian government, we further expect that respondents will hold images of immigration aligned with the dominant category of selected immigrants in Canada—skilled workers. Consequently, we expect:

H1: Individuals will tend to overestimate the size of annual immigration intake, and the extent of their overestimation will vary by component, with overestimation more common for refugees and asylum-seekers.

H2: Individuals will be more likely to represent immigrants as coming to Canada for work-related reasons than for other motives.

The factors that lead individuals to overestimate migration numbers are well documented in comparative context. As such, we expect that the same drivers will operate in the Canadian case; therefore, we control for attitudinal (that is, political affiliation, feelings of threat), behavioural (that is, media consumption) and individual characteristics (that is, gender, age, income, education, and visible minority status). In line with the literature that points to the importance of contextual factors, we also control for the population size of immigrants and visible minorities in the geographic area (using forward sortation postal codes) of the respondent.

Considering the evidence from other countries, we also expect that numerical estimations and images held by respondents will have consequences for attitudes toward immigration. In particular, we anticipate that overestimation of different categories of immigration and non-work-related representations of immigration will be associated with negative attitudes toward immigration, leading to the following two hypotheses:

H3: Numerical overestimators are less likely to be supportive of immigration (across all three categories of migration) than are correct estimators and underestimators.

H4: Individuals who think that immigrants come to Canada mainly to work are more likely to be supportive of immigration than those who think that immigrants come to Canada mainly for non-economic reasons (for example, to claim asylum or reunite with family).

Our analysis is based on the dominant assumption in immigration-related innumeracy research that numerical estimations and qualitative representations contribute to immigration attitudes. However, it is conceivable that the direction of causation could flow the other way (Hopkins et al., 2019; Blinder and Schaffner, 2020), with attitudes contributing to the selection of specific images or numbers associated with immigration. Unfortunately, our research design does not allow us to test for such an alternative directionality, but we explore such considerations in light of our results in the discussion section.

Data and Methodology

These hypotheses are tested using data drawn from an online survey of 1,104 Canadian respondents conducted over five days in June of 2019. The survey, administered by a Toronto-based market research company, was sent out to a regionally and gender-balanced standing online panel. All respondents were over 18 years of age. The survey took approximately 12 minutes to complete and was available in both French and English. The survey included socio-demographic questions and was centred on issues of migration, with modules that included questions about perceptions of migration, of government policies concerning immigration, and of refugee and asylum cases.

To address the non-probability nature of a recruited online panel, we employed standard methods of correction and validation to ensure our data are in line with a relevant probability sample (Yeager et al., 2011). In the sampling design phase, we stratified the sample by gender, region and age. We then applied post-stratification weighting to help correct for any remaining bias. Second, we validated the results of our survey against the 2019 Canadian Election Study on political interest, left/right self-placement and party identification. The weighting procedure and characteristics of our sample as compared to the 2019 Canadian Election study are described in the online supplementary materials.

The first step of our analysis is to explore the factors that influence the probability of overestimating immigration intake in different categories. The dependent variables are (1) a categorical variable differentiating between underestimators, correct estimators and overestimators of the flow of immigrants, refugees and asylum-seekers in 2018 and (2) a categorical variable identifying the type of immigrants that respondents imagine when thinking about immigration in Canada. For the first variable, similar to Blinder and Schaffner's (2020) approach, we asked for population estimates to provide a measure of the respondent's perceptions of migration intake between zero and a million. We created an artificial ceiling of one million with the knowledge that estimates falling over this bound would have been considered extreme outliers. We provided clear definitions to the respondent for key terms such as *immigrant*, *refugee* and *asylum-seeker* prior to asking them about each group. Following the respondent's answer, we provided accurate information on

Table 1 Descriptive Sample Data

	Measure of central tendency	SD	Min.	Max.
Left/right self- placement (0 to 10 scale) (μ)	4.9	2.1	0.0	10.0
Media usage (0 to 10 scale) (μ)	4.4	2.5	0.0	10.0
Print media (%)	30	—	0.0	100
Tabloid media (%)	10	—	0.0	100
Social media (%)	40	—	0.0	100
Cultural threat (1 to 4 scale) (μ)	2.7	1.1	1.0	4.0
Border insecurity (1 to 4 scale) (μ)	2.4	0.9	1.0	4.0
FSA rate of immigration (μ)	3.9	3.6	0.0	19.5
FSA Rate of VM (μ)	23.2	21.7	0.0	93.2
Female (%)	50	—	0.0	100
Age (η)	3.0	1.7	1.0	8.0
Income (η)	3.0	1.0	1.0	5.0
Education (η)	4.0	1.1	1.0	5.0
Visible minority (%)	20	—	0.0	100
Quebec (%)	20	—	0.0	100

migration intake for each category based on data from IRCC. For the second dependent variable, we followed Blinder's (2015) method, providing respondents with a choice between immigrants who come to Canada to study, immigrants who come to Canada to work, immigrants who come to Canada to claim asylum, and immigrants who come to reunite with their families (we also include a "don't know" option). We selected these options because they are used heavily in Canadian state and media discourses and in political debates about immigration in the country.

In the second step of our analysis, we consider whether these factors influence immigration attitudes, using the numerical estimations and respondents' images of immigration as independent variables. For our dependent variable, we created three indicator variables based on respondents' assessments of whether Canada should take in more, fewer or the same number of immigrants, refugees and asylum-seekers; those wanting more or the same number were coded together as 1, while those wanting fewer were coded as 0. We also ran a separate analysis based on answers to statements that reflect latent feelings and preferences about immigration: ethnocentrism (limiting immigration from Muslim-majority countries), insecurity about the impact of immigration on redistribution and preferences (fear that refugees receive more in government benefits than do pensioners), and desire for increased immigration enforcement (agreement with a statement about whether Canada is too friendly to immigrants coming into the country without a visa). Table 1 summarizes key descriptive elements of our data.

For each of these steps, we ran logit models controlling for variables that could explain our outcomes of interest. We measured ideological self-placement on a traditional 0 to 10 left/right scale. News media consumption was measured by asking about the frequency with which respondents consumed news (standardized as a 11-point scale, with 0 = never and 10 = regularly). We created dummy variables for daily print media consumption, daily tabloid consumption and for respondents who use social media as their main source of information

about immigration. To account for feelings of cultural threat and border insecurity, we used two variables: a Likert response about whether respondents agree that Canada should limit the number of immigrants coming from Muslim-majority countries (coded as $1 =$ strongly disagree and $4 =$ strongly agree) (Helbling, 2014; Verkuyten, 2021) and a Likert response about whether the respondent perceived the Canadian border to be secure (coded as $1 =$ strongly agree and $4 =$ strongly disagree). Gender (identifying as female $= 1$, not female $= 0$), highest level of education (primary, secondary, some post-secondary, completed post-secondary, graduate-level), visible minority self-identification ($0 =$ no, $1 =$ yes) and age are included in the models. Regionalism plays a strong role in Canadian politics, with Quebecois traditionally holding different views about diversity (Bilodeau et al., 2012; Turgeon and Bilodeau, 2021; Bilodeau and Turgeon, 2014). Therefore, a categorical variable for living in Quebec ($0 =$ no, $1 =$ yes) was included. Using 2016 Census data, we also added a variable capturing the rate of recent immigration and rate of visible minorities living in the area to gauge contact with migrants, matching data on the forward sortation area (FSA) of the respondent.

Considering the complexity associated with the interpretation of logistic regression coefficients, we present the results of our models using coefficient plots and interpret the significant odds ratios in the text. In these plots, significant results are represented by the horizontal lines that do not cross the vertical line set at zero. The length of the horizontal lines represents their confidence intervals at 95 per cent, while their position in relation to the vertical line signifies whether they increase the odds (positive value on the right) or decrease the odds (negative value on the left) for a respondent to express our outcome of interest. The complete model tables are presented as online supplementary materials, with interpretations and references in-text.

Results

Number and Images of Immigration

Figures 1, 2 and 3 show the distribution of numerical estimates for immigrants, refugees and asylum-seeker intake, respectively. For each immigration category, respondents were asked to estimate, on a scale from 0 to 1 million, how many individuals were admitted to Canada in 2018. While incorrect numerical estimation about immigration is not unexpected among the Canadian public, we can observe that its extent varies considerably across administrative and politically salient categories. When asked to estimate the number of immigrants accepted in 2018, respondents' answers ranged from less than 10,000 to 998,000 individuals (see Figure 1; the vertical line indicates the correct answer). The mean (364,831) and the median (327,000) responses are, however, quite close to the actual number of new immigrants in Canada for that year: 321,035 (Canada, 2020). A total of 50 per cent of responses are situated between 202,000 and 502,000. These data suggest that Canadians' estimates of general immigration intake are reasonably close to the actual rate of intake and that a considerable number of respondents underestimate actual intake.
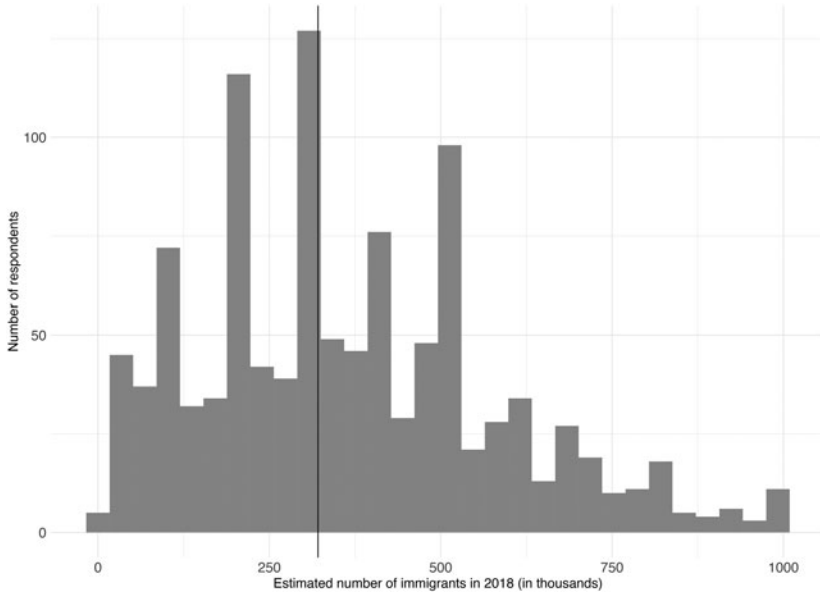
Figure 1 Distribution of numerical estimates for arrivals of immigrants in 2018
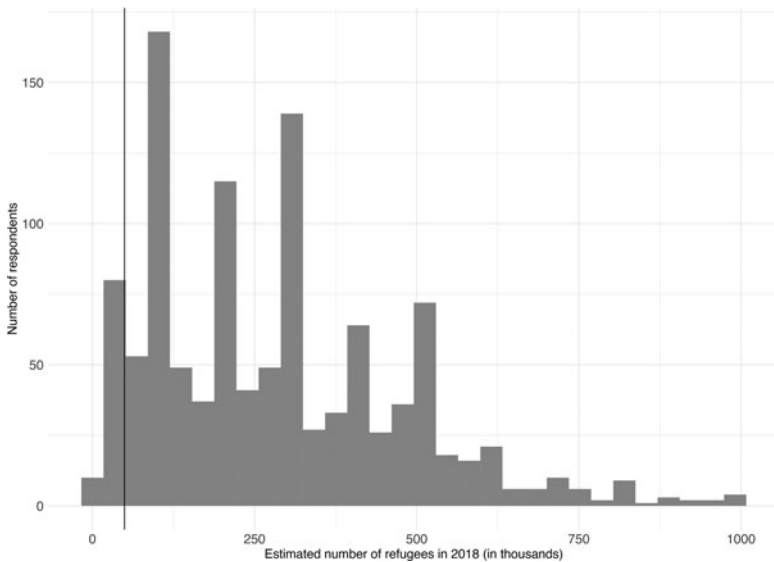

Figure 2 Distribution of numerical estimates for arrivals of refugees in 2018

Canadians are less precise in their estimates when it comes to refugees. When asked roughly how many refugees were accepted in Canada in 2018, respondents' responses ranged from 3,000 to 994,000. Figure 2 presents the
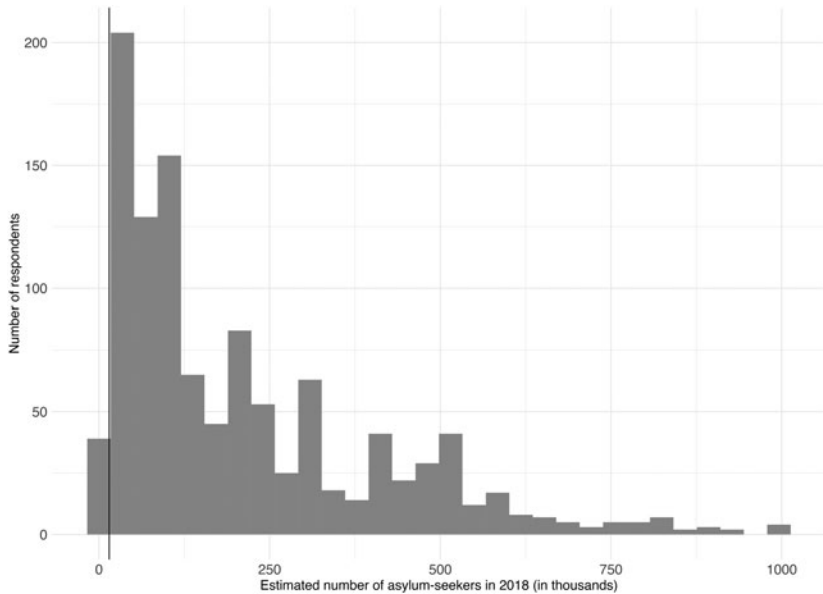
Figure 3 Distribution of numerical estimates for arrivals of asylum-seekers in 2018

distribution of estimates of refugees, with a vertical line indicating the correct answer. While the actual number of refugees accepted by Canada that year was 49,504, the median answer given by respondents was 256,000 (mean of 281,000). Only a very small number of respondents underestimated refugee intake amount. A total of 50 per cent of the respondents answered with a value between 106,000 and 404,000 when estimating the number of refugees coming to Canada in 2018.

A majority of respondents also overestimated the number of asylum-seekers arriving in Canada in 2018. Figure 3 reports their estimates and indicates the correct number with a vertical line. Responses ranged from 2,000 to 998,000 asylum-seekers, with a median response of 135,000 asylum-seekers. While the actual number of asylum-seekers admitted in 2018 was 15,000 (Paquet and Schertzer, 2020), 50 per cent of respondents estimated the size of this population to be between 59,000 and 219,400. A clear pattern of overestimation is thus also visible when it comes to respondent numeracy about asylum-seekers in Canada.

Taken together, these results confirm hypothesis 1: Canadians tend to overestimate the size of annual immigration intake, and the extent of their overestimation varies by component, with overestimation more common regarding refugees and asylum-seekers.

We also expect that specific mental images about immigrants—and, in particular, images of the reasons immigrants come to Canada—will serve as heuristics for respondents. To capture these images, we asked survey respondents to answer the following question: "When you think about immigrants coming to and living in Canada, which of these groups would you normally think about?" The two most

frequently associated immigration categories are immigrants who come to Canada to work (33.5%) and immigrants who come to Canada to claim asylum (29.4%). Immigrants coming to Canada to reunite with their family (14.9%) and to study (8%) were less often pictured (14.7% of respondents reported "don't know").[4] These answers diverge from the actual distribution of migrants accepted to these categories. In 2018, intake to the permanent immigration program were divided into three categories: economic class, which represented 58 per cent of all admissions; family reunification, which accounted for 26.5 per cent of admissions; and refugees and protected persons, which represented 15.5 per cent of annual permanent admissions (Canada, 2020).

On the surface, these data only partially support hypothesis 2. While recognizing that a large share of respondents think of immigrants as workers, we can see that a considerable number also think of migrants as primarily coming to Canada to receive state-sponsored protection. This estimation is much larger than the actual share of asylum-seekers and protected refugees coming into the country annually. Moreover, while 721,000 international student visas were granted in 2018 (Canada, 2020), which is more than double the number of permanent residents admitted the same year (321,035), we find that this category is not salient to respondents in our sample. Canadians thus hold a diversity of image-based understandings of immigration, and as in other countries, these diverge from the actual characteristics of inflows.

Predictors: Numbers and Images

Our analysis now turns to assessing drivers of numerical estimations of different components of immigration flow and specific mental images of immigration. Considering the distribution of these estimates, the complexity of estimating, and the documented bias associated with statistical innumeracy in the population (Nadeau et al., 1993; Wong, 2007), we compare overestimators with underestimators, assuming that the small proportion of correct estimators in the sample will align with underestimators. We find that 35.1 per cent of respondents overestimate the general immigration intake, while 68 per cent overestimate the annual intake of refugees. A total of 53.1 per cent of respondents overestimate Canada's intake of asylum-seekers.[5]

Following the dominant approach in the literature, Figure 4 summarizes the results of logistic regressions modelling the impact of political, informational, social and contextual variables on the probability of overestimating the intake size of different immigration components.

Figure 4 illustrates that Canadian overestimators for all immigration categories share characteristics predicted by comparative studies. Those identifying as female are more likely than those identifying as male to be overestimators, while older individuals and those with higher incomes are less likely to overestimate. Higher levels of education play a role in decreasing the chances of overestimating refugees and asylum intake but has no significant relationship to overestimating overall immigration intake. Respondents that are further on the right of the political spectrum tend to overestimate the size of the immigrant and refugee arrivals. Yet, surprisingly, political attitudes do not matter as much for overestimators of
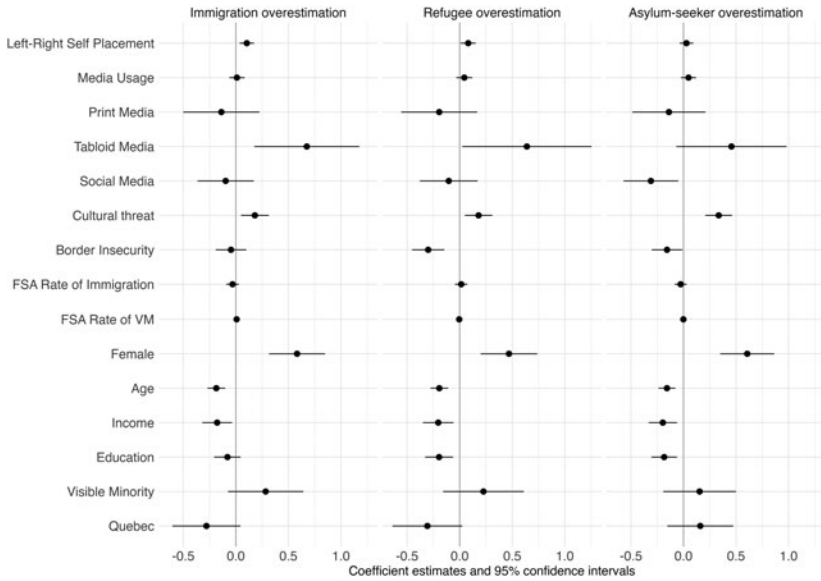
Figure 4 Drivers of numerical overestimation by immigration category[6]

asylum-seeker inflows as one might anticipate.[7] Information consumption is a better predictor of overestimation. While the quantity of media consumed is not significant (contrary to the literature), the type of media that respondents rely on to form their opinion affects their propensity to overestimate. Daily tabloid readers are much more likely than non-tabloid readers to overestimate intake of immigrants (increased marginal effect of 16 percentage points, holding other variables at the mean; $p \leq .01$), and refugees (increased marginal effect of 12 percentage points, holding other variables at the mean; $p \leq .05$). Interestingly, individuals getting information primarily from social media are less likely to overestimate, but reliance on social media is only significant for estimations of asylum-seekers intake (decreasing by 8 percentage points, holding other variables at the mean; $p \leq .05$). Quebecers are not more likely to be overestimators than Canadians living in other provinces. The odds of being an overestimator in any category increases for individuals displaying higher levels of cultural threat—although, interestingly, those reporting more border insecurity are less likely to overestimate the inflow of refugees and asylum-seekers.

Underestimators are only a group of interest when it comes to annual immigration intake because of the rarity of underestimating the intake of refugees and asylum-seekers. Figure 5 summarizes the results of a logistic regression with underestimators as the category of interest (see also Table 3 in supplementary materials). The model shows that political attitudes matter, with those on the left having increased odds of underestimating immigration intake, but that information-based factors, feelings of threat or cultural insecurity, and contact with immigrants do not matter as much for underestimators as they do for overestimators. Socio-demographic factors play out in predictable ways, for the most part; however,
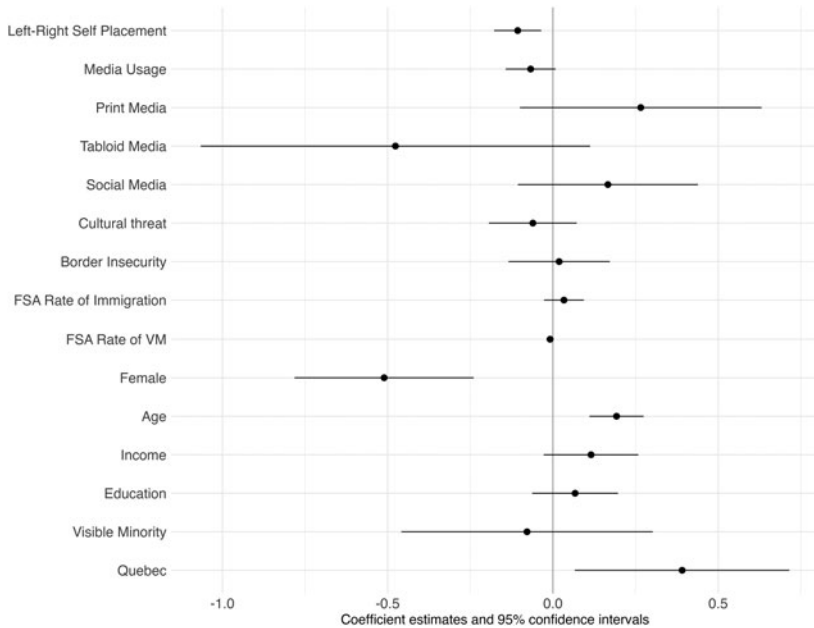
Figure 5 Drivers of numerical underestimation for immigrants[8]

Quebec residents in our sample were more likely than other Canadians to under-estimate the size of immigration inflows in 2018.

Figure 6 identifies factors that influence images of immigration, operational-ized as beliefs about the reasons for immigrating to Canada. Respondents who do not identify as female, those with higher media consumption, and those report-ing lower levels of cultural threat are significantly more likely to picture immi-grants coming to Canada for work. Those who identify as female, those who read tabloid media, and those with higher levels of border insecurity and feelings of cultural threat are more likely to envision immigrants coming for protection or asylum. Being a visible minority and consuming mainly print media, however, are the only significant predictors for those thinking of immigrants as mainly coming to Canada for family reunification. Here, identifying as a visible minority increases the probability of associating immigration with family reunification by 7 percentage points when keeping other variables at their mean ($p \leq .05$). Those who think of immigrants as coming to Canada to study are more likely to be younger and to report more cultural insecurity, though these two predictors are not suggestive of a definitive pattern. Finally, respondents who responded "don't know" present an interesting, if expected, contrast. This response seems to be driven by individuals who report lower levels of education and lower levels of media consumption and who tend to be tabloid consumers. Established regional trends do not correspond with a particular image of migrants, with the results showing no significant difference between the responses of Quebec residents and other Canadians.
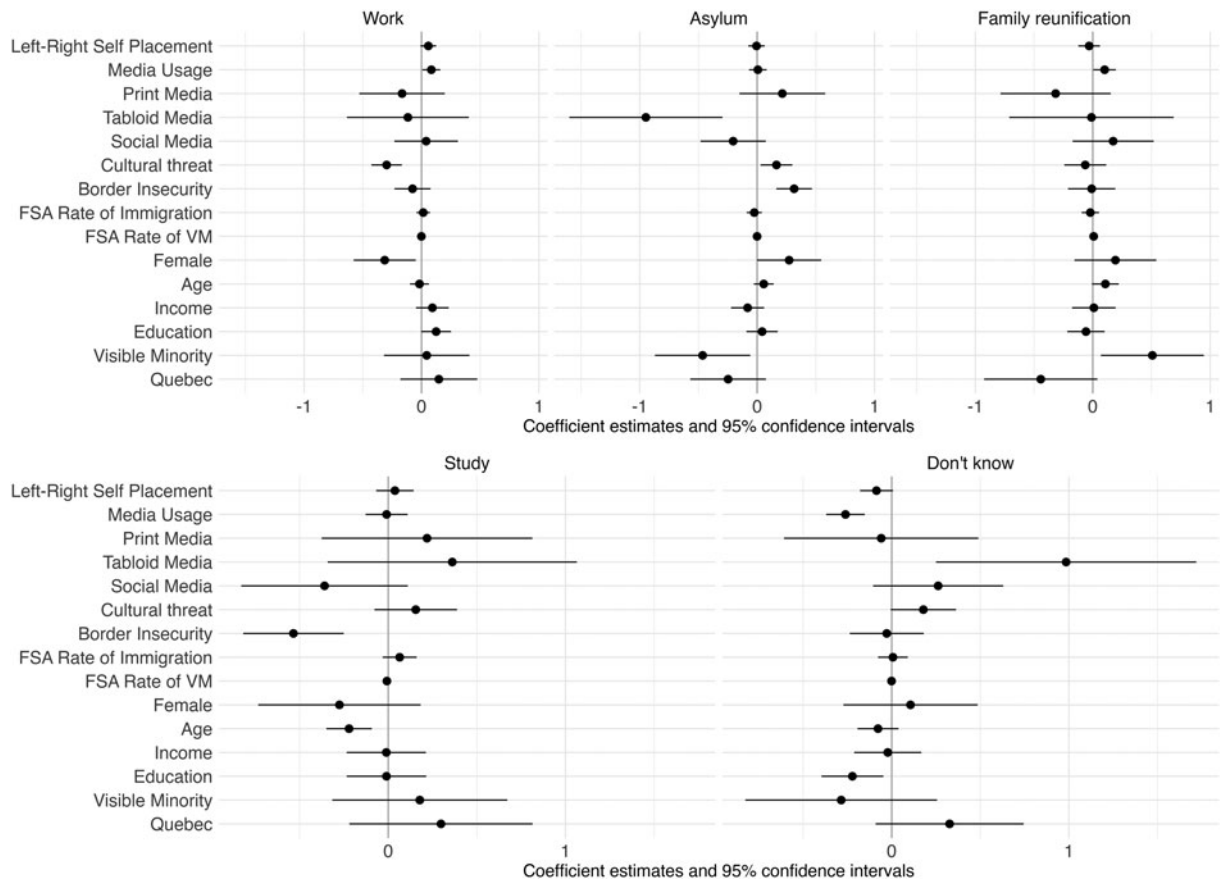
Figure 6 Drivers of images of immigration[9]

The Impact of Number and Images on Policy Preferences

What are the consequences of the way Canadians think about these numbers and images for attitudes toward immigration? To explore this question, we replicate approaches from Blinder (2015) and Herda (2013, 2020) by using the direction of innumeracy (that is, over/underestimating) and specific cognitive representations of immigration as a predictor of restrictive attitudes toward migration. Moving beyond basic attitudes toward immigration levels, however, we also examine whether estimates of number and images assist in predicting latent perceptions and preferences associated with Canada's immigration policy. Latent feelings of ethnocentrism were explored by a question about limiting immigration from Muslim-majority countries. Insecurity about the impact of refugee intake on redistribution was measured by asking respondents if they agreed or disagreed about the following statement: "Canada gives more money to a refugee than it does to the average pensioner." Finally, preferences for stronger immigration enforcement (associated with the 2016–17 influx of asylum-seekers at the US-Canada border) were measured by asking respondents if they felt that Canada was too friendly toward those trying to enter without a visa. In this way, we tap into attitudes toward all three migration groups separately, though we acknowledge respondents might not delineate as precisely.[10]

Using over- and underestimation as independent variables, Figure 7 displays the results of logit models predicting the odds of wanting fewer immigrants, refugees and asylum-seekers admitted to Canada. The data show a surprising result: overestimating the number of immigrants does not increase the probability of preferring a decrease in immigration levels across Canada.[11] This is true for all categories of migration. Here, political ideology and concern about border security play larger and significant roles, in addition to individual-level controls. This finding is unique in that numerical overestimation of immigration across categories is not a useful predictor of restrictionist attitudes toward immigration in Canada, as opposed to the pattern documented in other countries.
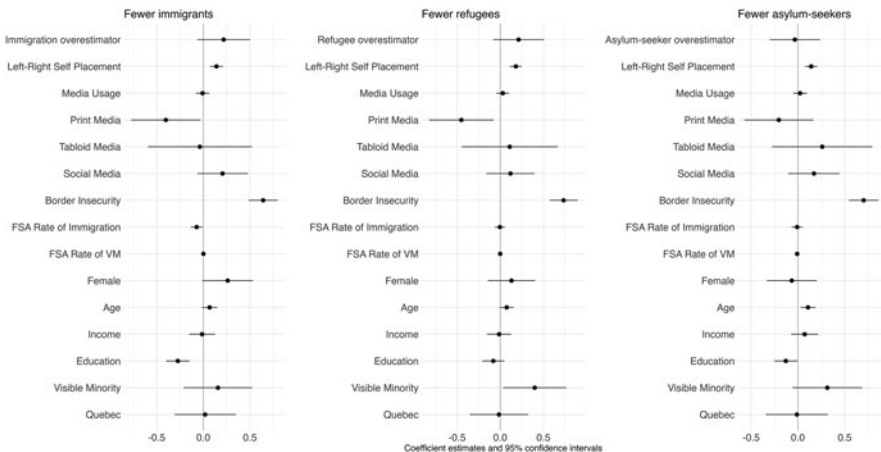

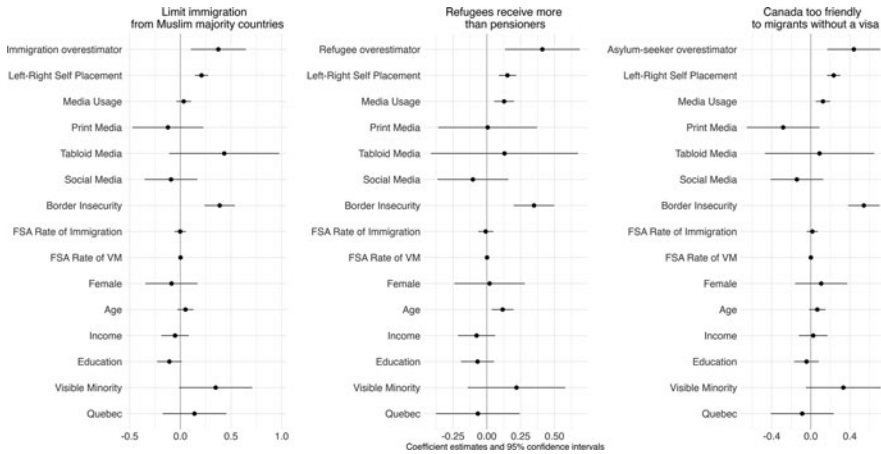**Figure 7** Impact of numerical estimations on preferences for decreasing immigration by category[12]

Figure 8 Impact of numerical estimations on latent immigration preferences[15]

Numerical estimations do have an effect, however, on latent immigration preferences, as illustrated in Figure 8. Controlling for other factors, overestimating the size of immigrant intake increases the odds of agreeing with the idea of limiting immigration from Muslim-majority countries by 9 percentage points when keeping other variables at their mean ($p \leq .01$). In addition, overestimating the annual intake of refugees and asylum-seekers increases significantly the probability of expressing insecurity about refugees and redistribution, as well as about asylum-seekers and border security.

We also anticipate that holding a specific image of the reason for immigration may increase the likelihood of expressing negative attitudes toward immigration. After controlling for other variables, Figure 9 shows that respondents who imagine immigrants coming to Canada for humanitarian reasons are more likely to express preferences for lowering immigration intake across categories. Moreover, thinking of immigrants as coming to Canada to study appears to significantly increase the probability of supporting a decrease in immigration levels—a finding that is less intuitive, as the acceptance of skilled workers has generally been high; however, it may reflect concern over the pathway to becoming a skilled worker (for example, an economic migrant relying on Canadian training compared with one who is coming with completed training or accreditation in hand). Images of immigrants coming for family reunification reasons have no significant effect on wanting less migration.[13]

By contrast, images of immigration are more helpful in predicting latent preferences toward immigration. Figure 10 shows that those thinking of immigrants as arriving for humanitarian reasons are uniformly negative toward all three questions.[14] This is consistent with the literature that points to enhanced negativity toward more vulnerable migrants and ties in with the literature's assessment of perceptions of "deservingness" for refugees and asylum-seekers (De Coninck and Matthijs, 2020; Lawlor and Paquet, 2021). Somewhat surprisingly, however, images of individuals coming to study enhance negative attitudes toward immigration from Muslim-majority countries, as
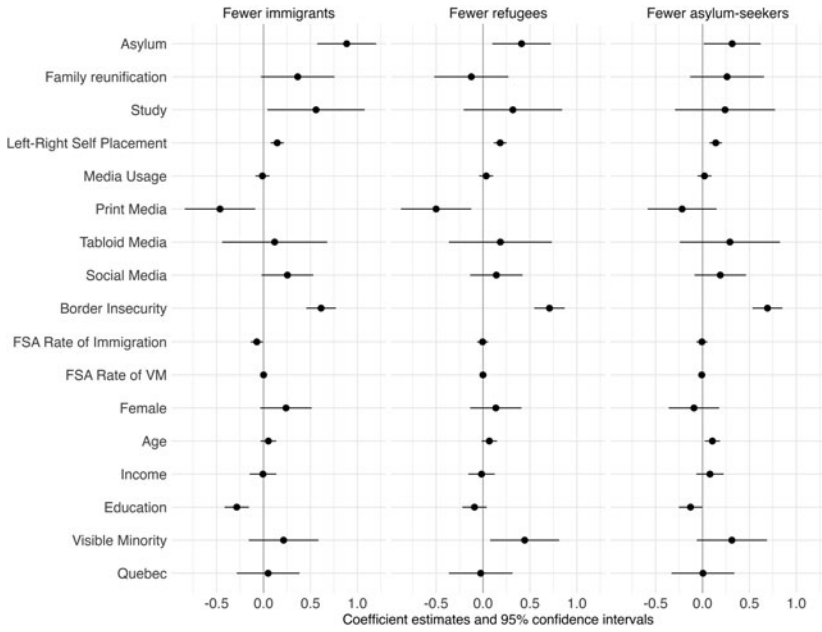
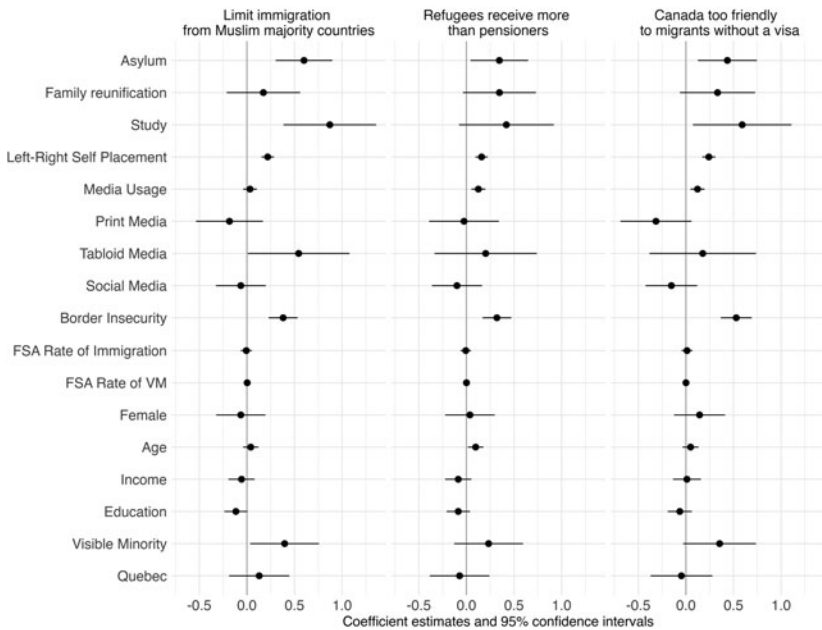**Figure 9** Impact of images on preference for decreasing immigration by category[16]

Figure 10 Impact of image-based understandings on latent immigration preferences[17]

well as perceptions of threat by individuals without visas. This is less consistent with expectations, though it might suggest skepticism toward individuals who arrive with a temporary visa and corresponding concern that they may stay beyond that initial permit period. This also leads to further questions about images held about the ethnic origin of students arriving to Canada to complete post-secondary training. Images of immigrants coming for reasons of family reunification appears to have no effect on latent attitudes toward migration.

We thus find that, after controlling for individual-level variables, numerical estimations and image-based understandings produce variable effects on the immigration policy preferences of the Canadians sampled here. Hypothesis 3 is partially confirmed: while numerical overestimation has little impact on preferences about immigration levels, it has robust consequences for latent preferences about migrants. Confirming hypothesis 4, we show that the images that respondents evoke when thinking about immigration matter considerably for their preferences about the number of immigrants that ought to be admitted to Canada, as well as for their views about immigration policy. Among Canadians, thinking of immigrants as coming to the country in order to work increases support for immigration, whereas thinking about immigrants as coming to the country in order to claim asylum or receive protection decreases support.

Discussion and Conclusion

Beliefs held about numbers and images matter for immigration attitudes in Canada. Empirical research on immigration innumeracy points to a robust trend of numerical overestimation. Our study demonstrates a surprising pattern: when it comes to immigrants, Canadians often underestimate or correctly estimate annual intake. In line with other cases, however, they overestimate the number of refugees and of asylum-seekers. Moreover, we documented that respondents, when thinking of immigration, rely on impressions that do not accurately reflect the actual character of Canada's immigration inflow. While many Canadians think of immigrants as coming in order to work, almost a third of respondents thought of immigrants as coming to seek asylum or as a refugee, which is not reflective of empirical data. In other words, our study demonstrates that Canadians have perceptions of immigration that are different from the reality of immigration in the country and that this has effects on preferences concerning immigration policy.

Our analysis shows that Canadians' representations of numbers and images of immigration are particularly affected by media consumption and by feelings of threat and insecurity, in addition to the usual individual-level predictors identified in comparative studies about immigration. Ideological placement also has a clear effect on Canadians' estimates, as is the case in other countries. Moreover, we find no evidence of the influence of demographic contexts on the numbers and images associated with immigration in our sample: the density of recent immigrants and of visible minorities residing in someone's geographical area does not increase or decrease the probability of that person having specific perceptions of immigration.

Thus, this research points to the importance of exploring Canada-specific patterns and drivers of immigration-related innumeracy and image-based understandings. The analysis of images and images of immigration should expand beyond the

salient administrative categories used in this project to explore other characteristics respondents rely on when thinking about immigration, such as immigrants' national origins, visible minority status, level of education, language ability, and religiosity. As the realities of immigration vary tremendously by region, future research should explore if images and numbers associated with immigration vary by province. While our analysis has suggested that this does not appear to be the case in Quebec, more work should test if there are differences between provinces that have traditionally received more immigrants than others (for example: Ontario or British Columbia) and those that received a particularly high concentration of immigrants from specific countries or coming through a particular immigration program. Moreover, as media consumption appears to have significant importance in driving numbers and images held by respondents, future work should link immigration-related framing and tone of particular media outlets to different numerical and image-based understandings of migration in the Canadian public (Bastien, 2022; Blinder and Jeannet, 2018; Meltzer and Schemer, 2021).

Through this study, we show that the numbers and pictures that people have in mind when thinking about immigration matter to their immigration attitudes. While numerical overestimation has little impact on preferences about immigration levels, it has robust consequences for latent preferences about immigration policy—much of which relates to who should be accepted as an immigrant in Canada. Our study shows that images of immigration matter considerably for preferences about the number of immigrants to be admitted into Canada, as well as for latent views about immigration policy, with economic migration associated mostly strongly with pro-immigration views. More importantly, and similar to results of studies from other countries, we find that images associated with refugees and protection are associated with preferences for lowering immigration intake and for excluding certain immigrant groups from entry and social rights, as well as with perceptions of lax immigration enforcement.

These results suggest that adding questions about numerical estimates and image-based understandings in surveys about immigration preferences can be a helpful practice to better foreground results. Knowing what images and estimates respondents use when reporting their immigration preferences can aid in specifying the impact of other determinants, such as feelings of threat or political ideology. Considering the documented issues with innumeracy across policy issues (Lawrence and Sides, 2014), our results also suggest that numerical estimates might be a limited measure of perceptions of immigration. Indeed, this article hints at the fact that, in Canada as elsewhere, image-based understandings might be a better indicator of the heuristics contributing to immigration attitudes. The direction of the relationship between numerical and qualitative perceptions of immigration and attitudes remains to be explored in greater detail (Hopkins et al., 2019; Blinder and Schaffner, 2020). More broadly, the link between qualitative perceptions of immigration and the salience of different immigrant groups in public debates, as well as the potential impact of this relation on immigration attitudes, has to be considered in light of these results.

Finally, our results point to specificities about immigration preferences that may be unique to Canada: comparatively low levels of overestimation for immigrants, lower impact of numerical overestimation for some immigration attitudes, and

the modal presence of economic migration associated with pro-immigration attitudes. Part of this pattern might be explained at the aggregate level, as is suggested by comparative studies, by the country's high gross domestic product (GDP) and by the overall share of immigrants in the population (Citrin and Sides, 2008; Herda, 2013). There are also reasons to consider that the specific context in which immigration politics unfolds in Canada might contribute to these outcomes (Lawlor and Paquet, 2021). Alongside much of the Canadian media, the Canadian government is very vocal about their choice to augment immigrant levels and about the reasons driving the need to increase the size of immigration intake. Our results expose the possibility that such state discourse generates an information-rich environment that neutralizes some concerns about immigrant population sizes. A similar dynamic might be at play when it comes to images of immigration, given the dominance of discourse about the economic contribution of immigrants in Canada and the emphasis on immigrants as a solution to the country's labour shortage. These patterns point to regime-level drivers of numbers and images of immigration that have yet to be explored in both the Canadian case and comparatively. Finally, this analysis points to the existence of a disconnect between the evolution of Canada's immigration programs and public perceptions. As the government has set ambitious targets to increase immigration (Canada, 2022), this disconnect should invite us to think about policy interventions targeting misinformation about immigration.

Supplementary Material. To view supplementary material for this article, please visit https://doi.org/10. 1017/S0008423922000786

Notes

1 Note that IRCC delivers a range of possible admission rates for these categories, with the estimates above reflective of the high end of the range.

2 This is especially important considering the changing composition of migration flows in Canada. In addition to increasing its overall selected immigration targets, the country has seen a growing proportion of its immigrant intake come from temporary immigrants since the mid-1990s. Moreover, the irregular arrivals of asylum-seekers crossing the Canada–US border since 2018 has been a highly visible "novelty" in terms of immigration flows. In Canada and elsewhere, these changes matter because of heterogeneous informational asymmetries about these groups in the population and because of the differentiated framing they receive in the national media (Lawlor and Tolley, 2017).

3 Population estimations are notoriously fraught with error (Nadeau et al., 1993). Estimations of subgroups within the population (for example, immigrants) tend to be difficult for most people, because they usually do not have a strong sense of baseline population figures. Thus, measurement of innumeracy, particularly in reference to a subgroup associated with eliciting strong opinions depending on national context, has become of significant interest to migration researchers. (For different approaches to conceptualizing and measuring this reality in empirical research, see Citrin and Sides [2008], Herda [2010, 2013, 2015, 2020] and Alba [2005]).

4 As shown by Herda (2013), those who report "don't know" in their estimates of immigration admission may display a particular pattern of immigration innumeracy generated by low contact with immigrants and low media consumption. These individuals may also exhibit higher feelings of threat. They thus represent an analytical category of interest for future work.

5 We also ran separate analyses with over- and underestimators separated out into "slight" over/underestimators and "severe" over/underestimators but did not find that this distinction gave us any empirical information that was not present in a basic differentiation of over/underestimators. Therefore, we report these categories together.

6 The full model is presented in Table 2 of the supplementary materials.

7 We also substituted party identification as a measure of political attitudes but saw surprisingly few effects in the results. Therefore, we omit party identification for the more parsimonious left/right measure.

8 The full model is presented in Table 3 of the supplementary materials.

9 The full model is presented in Table 4 of the supplementary materials.

10 To avoid any issue of endogeneity, we removed the variable about respondent's level of cultural threat from the list of dependent variables in these models. Before doing so, we tested the model with and without the potentially endogenous predictor and found minimal differences in the size of standard errors. However, because the variable presented the theoretical possibility of endogeneity, we omitted it to prevent concern.

11 These results also hold when disaggregating overestimators into smaller discrete categories; results available upon request.

12 The full model is presented in Table 5 of the supplementary materials.

13 Respondents who answered "work" used as baseline.

14 Respondents who answered "work" used as baseline.

15 The full model is presented in Table 6 of the supplementary materials.

16 The full model is presented in Table 7 of the supplementary materials.

17 The full model is presented in Table 8 of the supplementary materials.

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