

SOCIAL CAPITAL, MULTICULTURAL POLICIES, AND THE WELFARE STATE:
EXAMINING THE DETERMINANTS OF IMMIGRANT INTEGRATION

by

REGAN W. DAMRON

(Under the direction of Markus M. L. Crepaz)

ABSTRACT

Although many studies of the processes through which immigrants become integrated into their host societies have emphasized social capital and trust, they have tended to do so only with regard to the immigrant groups themselves; that is, they have examined the effects of social capital and trust *within* immigrant groups. A theory is offered that posits a positive contextual effect for the aggregate-level social capital and trust existing in the host societies in which the immigrant groups find themselves embedded. This effect is argued to exist independently of the social capital stores of the immigrant groups in question. In order to empirically test this theory (as well as to contribute to rectifying the paucity of empirical studies on integration more generally), a novel measurement of immigrant integration is developed based on the conceptualization of integration as the process by which immigrant populations become similar to the native-born with respect to certain indicators. In order to avoid common statistical assumptions regarding data-generating processes and functional forms, this measurement is generated using a neural network. Alternative hypotheses regarding multicultural policies, welfare state expansiveness, and macroeconomic and geographic determinants are developed and evaluated. A cross-national analysis provides support for the primary hypothesis, but can only be regarded as suggestive due to its data limitations. An analysis across the US states is undertaken to expand the number of available

data points and thus enhance the validity of the statistical inferences drawn. In a multilevel analysis across all state-groups, the macroeconomic and geographic controls outperform the other structural variables, as well as social capital. A case study of the Mexico-born in the US, however, eliminates outliers and shows that social capital does indeed have a positive and significant effect even in the presence of the control variables. Implications for current theoretical understanding and policymaking and suggestions for future research are then discussed in light of these findings.

INDEX WORDS: Immigration, Integration, Incorporation, Assimilation, Acculturation, Social Capital, Trust, Welfare State, Multiculturalism, Universal Liberalism, Multilevel Modeling, Bayesian Statistics, Measurement, Measurement Theory, Neural Networks

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REGAN W. DAMRON

B.A., The University of Georgia, 2000

M.A., The University of Georgia, 2004

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REGAN W. DAMRON

Approved:

Major Professor: Markus M. L. Crepaz

Committee: Han S. Park

Ryan Bakker

Sherry Lowrance

Electronic Version Approved:

Maureen Grasso
Dean of the Graduate School
The University of Georgia
August 2010

DEDICATION

This work represents a great deal of time, effort, and patience not only on my part, but on the part of those who have supported me throughout this endeavor. It is for that reason that I dedicate this manuscript to my wife Edwige and to our baby son Liam, with both of whom I look forward to spending a great deal more quality time in the coming months and years.

-R. D.

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As with any project of this magnitude, there are many to whom I owe a debt of gratitude. The contributions of my committee have been substantial. The insights of Drs. Markus Crepaz, Han Park, Ryan Bakker, and Sherry Lowrance have all been invaluable. Although their criticism has sometimes been barbed, it has helped to socialize me into the discipline by thickening my skin, strengthening my resolve, and above all by honing my thinking on my chosen subject.

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Richard Johnston at the University of British Columbia for providing Wave II of his *Equality, Security, and Community* (ESC) survey prior to its official release, along with most helpful guidance concerning its proper use. While I have made use of many of these contributions herein, some have not found their way into these pages. All have proven useful in exploratory analyses, however, and so I wish to acknowledge my gratitude to these fine scholars.

Many thanks, as well, go to Laura Moyer, Chris Weber, and the rest of the faculty of the Department of Political Science at Louisiana State University, to whom I was privileged to present some of these ideas in November 2009 and from whom I enjoyed a great deal of feedback that benefited the work. Portions of this work have also been presented at the 2009 annual meeting of the American Political Science Association (APSA) and the 2010 annual meeting of the Southern Political Science Association (SPSA).

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Finally, I would thank my parents, Dan and Sherry Damron, for having instilled in me the respect for and love of learning that has led me to pursue this course of study.

And as a matter of course, I would emphasize that any flaws in the manuscript that follows are my own, and exist independent of those who have been so gracious as to offer their aid with the project.

PREFACE

I feel that I should say a few words about the genesis of this project, as well as the great deal of work that went on behind-the-scenes to bring it to fruition. A simple page count does not suffice to gauge the latter, and the former, I think, is far from obvious.

The general topic of immigrant integration was suggested to me by Dr. Markus M. L. Crepaz, just prior to my departure for Verona, Italy in the summer of 2008 to teach a course on contemporary global issues for one of Globis' fine study abroad programs. It was there that the idea for the project began to take root, through discussions with Dr. Crepaz over games of table tennis (*not* "ping-pong," I learned) and walks through the alleyways of the city.

In its original form, the theory required looking at characteristics of both the immigrant groups and the host societies in which they find themselves embedded. It explicitly posited interactions between particular variables at both of these levels. Although this theory was quite exciting, it suffered from a major problem. One of the things I wanted to accomplish with my research was to conduct a quantitative analysis of the phenomenon of integration, as there are so very few. The barrier to evaluating the posited interaction effects (three-way interactions, in fact) was the lack of reliable, broadly available quantitative data regarding the characteristics of the immigrant groups. I originally thought that I might use the characteristics of their home societies (their countries of origin) as proxy measures, but preliminary analyses using Debbie Schildkraut's *Twenty-First Century Americanism* survey interfaced with the *World Values Survey* (WVS) data showed that this strategy was not viable.¹

¹In fact, there are interesting and useful reasons for why this is so, and these shall be the subject of future work.

Happily, I was able to recast the theory to use many of the same variables in which I was interested without positing such untestable interaction effects. The research contained herein is the result of that transformation.

In order to proceed, however, I needed to find a meaningful measurement of integration itself. After revamping the theory, this became my focus. I combed the literature, but no current measure seemed to do justice to the richness of the concept. After much thoughtful investigation, I settled on a novel measurement strategy using artificial neural networks (ANNs), a technique developed at the nexus of psychology and computer science in the relatively new field of artificial intelligence.² ANNs are not widely used in the social sciences, and certainly not as a tool for measurement. There are good reasons for this, primary among them being the paucity of prepackaged software routines for their implementation. I realized that taking this approach would entail extra time and effort. Still, I decided to stay true to myself and my passion for doing research as best as I am able, prioritizing intellectual honesty over other concerns. This, I told myself, is the one thing that I must retain throughout this process. I have yet to reap the full benefits that I projected would accrue from having taken this stance, but I have little doubt that I shall.

At any rate, it is this innovation that required much of the aforementioned wealth of work behind the scenes. Were one to peer under the hood of this document, one would see exactly 2,810 lines of R code in 21 source files and a conservatively estimated 7,000 lines of Stata programming code in 70 “.do” files.³ In addition, dozens of WinBUGS models were run. The grand total is something on the order of 10,000 lines of programming code in over 100 executable files. The methodological demands have thus been fairly intense—but the

²I decided to use ANNs rather than support vector machines (SVMs) for the simple reason that the former are more intuitively explicable to persons unfamiliar with such methods.

³The Stata files were estimated at 100 lines each; in reality, many are much larger (e.g., 271, 221, or 186), but very few are smaller (the smallest is actually 69 lines). Also of note, each line comprises a complete command (I do not break long commands across multiple lines), and for loops were employed whenever possible to avoid redundancies in the code.

learning experience, I must point out, has been equally so. And therein lies the value of a well-executed dissertation to its writer.

I close by reiterating my indebtedness to those fine persons listed in the acknowledgments. Again, any flaws in the manuscript that follows are my own.

-R. D., 18 June 2010

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CHAPTER 1

INTRODUCTION

The recent rise in international migration is by now well-documented. A decade ago, in the year 2000, about one in five denizens of countries like Australia (23%), Canada (17%), New Zealand (17%), and Switzerland (22%) were already foreign-born, and one in ten in the United States (11%), Germany (12%), Austria (10%), Belgium (10%), Greece (10%), and France (10%) were so. These numbers continue to rise, and had all increased by multiple percentage points by 2006 (OECD 2009).

Given this state of affairs, questions have arisen concerning the impact of such increasing diversity on the social cohesion of the host societies, as well as regarding appropriate policy responses. To understand how best to preserve social solidarity under these circumstances (or indeed, to assess whether it is actually under threat), we must understand the process by which the newcomers become adapted to their host societies.

This process is referred to as “integration,” and unsurprisingly in light of the gravity of these issues, there is already a wealth of literature on the subject. The disciplines of anthropology, sociology, and political science have been investigating this process for quite some time. The differences in their substantive foci and methodological approaches have enabled their practitioners to labor largely in isolation from one-another, however, despite the fact that their theories and findings are obviously complementary. That this potential for synthesis remains so untapped is puzzling, particularly given the nature and tone of contemporary theoretical and policy debates.

What is striking about the literature on integration is that it overwhelmingly focuses on the characteristics of the immigrant groups themselves, with most of the studies having been

conducted by sociologists and anthropologists.¹ Certainly the causes at this level are the most proximate, and so merit such attention; still, the paucity of work regarding the characteristics of the host societies is curious, particularly when these characteristics have been theorized and/or shown in the political science literature to affect variables that are posited by sociologists and anthropologists to intervene in causal processes affecting integration at the level of the immigrant group. Moreover, if one's goal is to make policy on an aggregate (say, national) level, a focus on these higher-level determinants and how they tend to operate on average is necessary to inform those decisions.

To make this abstract discussion more concrete, we will focus on a single such determinant at the host society level. Social capital (and trust as a component thereof) is the thread that underlies all of the major theories of integration. But this is not simply one author's assertion. In fact, Philips & Fishman (2006, 491) argue as well that “the proposition underlying all theories of assimilation concerns the nature of the relationship between ethnic capital [i.e., social and human capital within the immigrant group -RWD] and length of residency.” In particular, they point out that the “straight-line” theories of integration (Warner & Srole 1945, Wirth 1929) argue that within-group social capital declines steadily until the immigrant group as a social unit ceases to exist as a salient entity. Similarly, “ethnic revivalists” (Glazer & Moynihan 1964, Greeley 1971, Novak 1972) may be seen as positing that within-group social capital loses salience in the second generation but returns to prominence in the third and beyond, thus limiting the group's integration potential. Both of these schools of thought tend to tie the existence of the immigrant group's social capital to the very *ethnic identities* of its members, seeing the presence of the former as indicative of the saliency of the latter. The so-called “bumpy-line” theories (Gans 1992*a*), however, break this tie and argue that group members may revive their interest in within-group social capital as a merely *symbolic* representation of their ethnic identity that does not have great influence over their social,

¹It should be pointed out that this choice of focus is thus natural given the nature of the researchers' disciplinary training. The overwhelming choice of qualitative methodology in these studies (a point to which we will return) may also be at least partially attributed to this as well, in addition to the fact that the richness of the subject matter lends itself well to qualitative analysis.

political, and economic lives—and thus does not hinder their ability to integrate into their host society (Alba 1990, Gans 1979, Lieberman & Waters 1988, Waters 1990).

Given this fact, it is even more striking that only one level is considered in those theories: social capital has only been studied—and theorized about—within various immigrant groups. The existence of social capital in the host society has simply not been considered as a factor in integration outcomes (see, for example, Sanders & Nee 1987, Borjas 1992, Portes & Zhou 1994, Bankston & Zhou 1995, Borjas 1995, Borjas 1999, Ebaugh & Curry 2000, Nee & Sanders 2001, Djajic 2003, Constant & Massey 2003, Philips & Fishman 2006, Svendsen 2006). Even Portes & Sensenbrenner (1993), widely cited as having contributed to the understanding of the “structural determinants” of immigrant integration, speak solely of the structures that exist at the level of the immigrant group itself.

Existing political science literature suggests that social capital ought also be examined at the level of the host society. In particular, it has shown that aggregate-level social capital and trust leads to greater tolerance of differences and thus less “nativist resentment” vis-à-vis foreigners (e.g., Inglehart 1997, Crepaz 2008, Herreros & Criado 2009), which intervenes to countermand immigrant group-level causal processes argued to be injurious to integration (e.g., Portes & Sensenbrenner 1993, Portes & Zhou 1994, Djajic 2003). Given this, it is particularly puzzling that these two strains of literature have heretofore remained so largely isolated from one-another.

That said, one must read across multiple works with a certain mindset in order to see how social capital and trust in the host society may intervene to moderate integration processes; that is, it is not quite as obvious as it may seem. For instance, Portes & Sensenbrenner (1993) argue that the greater the social and cultural distance of the immigrant groups from the native members of the host society, the stronger the within-group solidarity will become. This occurs, they say, because greater distance increases the likelihood of nativist resentment, and the immigrant groups respond to this resentment by strengthening their within-group ties to ensure their continued esteem and survival. The link from nativist resentment to prejudice

and discrimination is made explicit in other, later work, thus bolstering this argument (Portes & Zhou 1994). And still elsewhere, a greater within-group focus is argued to negatively affect integration (Djajic 2003).

But social capital and trust in the host society can prevent this scenario from unfolding because it acts to inhibit the formation of the nativist resentment, prejudice, and discrimination that are at its root. Trusters are known to be more tolerant and less xenophobic than non-trusters (Inglehart 1997, 89–90), and more recently, both social capital in general and trust in particular have been shown to be associated specifically with more tolerant attitudes towards immigrants (Crepaz 2008, Herreros & Criado 2009).

In this way, we seek to fill the aforementioned theoretical and empirical void. We explicitly theorize and empirically examine the role of social capital and trust at the level of the host society in determining integration outcomes. The contributions of doing so are clear: we bridge the theoretical and disciplinary gaps between sociology and anthropology on the one hand and political science on the other, construct a novel measurement of integration that permits us to test the newly synthesized theory that results from this marriage empirically, and derive concrete policy recommendations from the resulting analyses.

The rest of this manuscript proceeds as follows: In chapter two, we survey the landscape of the literatures in question, defining the object of study and developing our primary and alternative hypotheses as we do so. Chapter three assesses existing strategies for the measurement of immigrant integration, finds them lacking, and details the construction of a novel measurement based on the conceptualization of integration developed in chapter two. Chapters four and five engage our hypotheses empirically, and chapter six concludes the project by summarizing the findings, discussing their policy implications, and using them to illuminate avenues for future research.

CHAPTER 2

THE CURRENT LITERATURE AND A NOVEL THEORY

We begin this chapter with a discussion of the concept of immigrant integration, followed by a review of integration theories. The concepts of social capital and trust are then introduced and extant work regarding them as determinants of integration is discussed with an eye toward further illuminating the theoretical “puzzle” that motivates our research. A new theory is then developed explaining why these concepts should matter as contextual (i.e., higher-level) determinants of integration and our primary hypothesis is formulated. Finally, some alternative hypotheses are derived from existing controversies in the literature.

2.1 DEFINING INTEGRATION

Before proceeding with a discussion of theories regarding integration (as well as the theory advanced herein), it is important to define the object of study. A review of the extant literature on the subject shows that this is no easy task; there is as much disagreement over the proper term to use as there is over its content. A list of full and partial cognate terms includes integration, incorporation, assimilation, conformism, absorption, acculturation, inclusion, participation, toleration, and cohesion. Each of these terms is value-laden and as such has the potential to stir emotions and to be politicized. Indeed, it has been suggested that government-funded studies in various European countries have been politicized to the point that their conclusions must be considered suspect (Favell 2000). For the sake of conceptual clarity and integrity, however, we must make a choice: we will use ‘integration’ throughout this manuscript. This term is adequately descriptive, yet avoids many of the negative images evoked by other terms such as assimilation (e.g., Anglo-conformism,

actively assimilationist policies, etc.). Furthermore, ‘integration’ is also preferable to ‘incorporation’ because the root verb of the latter seems to have more transitive connotations, denoting an effort on the part of some actor to ‘incorporate’ others. With this choice, perhaps we can minimize (if not altogether avoid) the tendency that Freeman (2004, 946) has described for such terms to “imply direction and intentionality, that immigrants *should* be incorporated into the societies to which they move, that this is a one-way process, and that the host society remains relatively unchanged if incorporation is successful” (cf. DeWind & Kasinitz 1997, Messina 2002).

Regarding the content of the term, Favell (2000) laments the fact that government-funded studies of integration in different European countries differ so greatly in their conceptions of integration that they limit the possibilities for cross-national comparative studies. For example, the French have a very expansive view of what constitutes integration, one that includes congruence with natives regarding values as well as more pragmatic socioeconomic indicators, while the Belgians tend to focus on immigrants’ choice of language in their narrower conception, as this choice is very politically salient in their society.

Some conceptions of integration also include actions or attitudes (or the lack thereof) on the part of members of the host society that are directed at the newcomers. Gordon’s (1964) pioneering book is a prime example of this, as his conception includes the absence of prejudice (as an attitudinal component) and discrimination (as its behavioral expression) towards the immigrant group as a part of his definition of “assimilation.” More recent work employing survey data to examine attitudes towards immigrants seems to tacitly make this connection, as well (e.g., Hopkins 2010, Hainmueller & Hiscox 2010).

Some have even defined integration to be a policy stance having content of its own, rather than as a process. Freeman (2004, 945), for example, describes integration as “a middling form of incorporation...that rejects permanent inclusion but neither demands assimilation nor embraces formal multiculturalism.”

Generally, though, the common thread is that integration is a process that entails immigrants becoming less differentiated from (more similar to) the members of their host society. We will take this stance and argue in addition that it is a group-level phenomenon that may take place over multiple generations.¹ That is, even though individual immigrants may not become fluent in English in the United States, for example, their children will likely become so, thus becoming more ‘integrated’ than their parents. Language acquisition is but one of many ways that immigrants may become integrated. Others might include intermarriage with the native (citizen) population, having a job outside of one’s “immigrant enclave,” the achievement of socioeconomic mobility, education, political participation, civic engagement, home ownership, etc.² Henceforth, we refer to this process when we speak of integration.

2.2 INTEGRATION THEORIES

There are three major schools of thought regarding the processes of integration, and they all remain undertheorized because they are forward-looking, seeking to understand the future of host societies rather than to provide a unified framework for understanding the processes of integration themselves (Philips & Fishman 2006). “Straight-line” theories (Warner & Srole 1945, Wirth 1929) posit a steady, unidirectional process through which immigrant groups become more and more like the native population with each successive generation.³ These theories were initiated by the Chicago School of Sociology and were generated during the round of southern and eastern European immigration to the US from 1880 to 1925, during a time of more or less continuous American economic growth that was heavily dependent on immigrant physical labor; this may explain in part their unidirectional nature (Gans 1992*b*).

¹In making this argument, we remain compatible with the dominant strains of integration theory that are reviewed below.

²Many of these items are interrelated. We make no claims as to their statistical separability; rather, the goal is to list examples so that the reader may get a better sense of what is meant by the term ‘integration.’

³In this, these theories are not unlike the economic development theories of the 1960s, best typified by Rostow (1960).

“Ethnic revivalists” (Glazer & Moynihan 1964, Greeley 1971, Novak 1972) argue that there is an increase in ethnic identification beyond the second generation, in the third generation and beyond. They claim that this revival of ethnic identity is germane because it limits the potential for integration to occur. The third school consists of “bumpy-line” theories (Gans 1992*a*). They synthesize the two other schools and argue that ethnic identity does decline precipitously over the course of multiple generations and that a revival of ethnic identity indeed occurs, but that the latter is of little relevance to integration outcomes because it is largely symbolic in nature and relatively content-free (Alba 1990, Gans 1979, Lieberman & Waters 1988, Waters 1990). Many proponents of this position recognize that rates of integration vary across immigrant groups, as well, with some retaining their ethnic identity longer than others (Alba 1990, Alba & Nee 2003).

This discussion further supports assertions made earlier. In particular, it points up the facts that (1) integration is generally conceived of as the process by which immigrants become more similar to the native populations of their host societies and (2) a conception of integration as a generational phenomenon is dominant. Both of these facts serve to illustrate the compatibility of our earlier arguments with the existing literature. Furthermore, another common thread underlying all of these theories is the nature of the relationship between the within-group social capital of the immigrants to the length of their residency in the host society and the role that this plays in their integration.

We will return to this latter point momentarily; before we do so, an introduction to the concepts of social capital and trust is necessary.

2.3 THE PRIMARY HYPOTHESIS: SOCIAL CAPITAL

2.3.1 SOCIAL CAPITAL AND TRUST: A BRIEF PRIMER

Approximately a decade ago, Eric M. Uslaner began a new strain of research in the social capital literature, one specifically targeting trust (Uslaner 1999, Uslaner 2001*a*, Uslaner 2001*b*, Uslaner 2002). In particular, he argues that the type of trust required for overcoming the

barriers to collective action on a societal level is a “moral” one, one that he suggests is a value-based conception that is developed during one’s formative years and is, in fact, resistant to change. Since this type of trust is a moral value, it is not contingent; rather, it is freely given. Moral trust is set in opposition to a “strategic” conception of trust, which is the familiar rationally self-interested type found in game-theoretic models. Uslaner’s primary explanation for the necessity of this distinction is that strategic trust can only explain cooperation in repeat games among relatively small groups, for one must have personal knowledge of others in order to trust them; it cannot explain why two individuals who do not already know one-another would choose to cooperate in the first instance (or in a one-shot game), particularly in the context of a larger society. Moral trust fills this gap and in so doing demonstrates its necessity to overcoming barriers to collective action on a large scale. Next, he identifies each of these ideal types of trust with its expressive counterpart: moral trust is thus linked to “generalized” trust while strategic trust is linked to “particularized” trust. Generalized trust is, as the term suggests, a fundamental trust in others in general. A generalized truster would not hesitate to leave her valuables (e.g., pens, paper, books—even a laptop computer) on her table in a café while she goes to get a cup of coffee, for example. A particularized truster would more likely ask someone to watch over the valuables, but only if the stranger was perceived to belong to her in-group (that is, if the stranger shared some key characteristics with the particularized truster). Such a person would balk at the prospect of trusting the stranger if she was perceived to be too different from herself or to belong to an outgroup. The key difference between the two types of social trust is thus that particularized trust is contingent because it is based on strategic trust, while generalized trust is more freely given.

The way this relates to Robert Putnam’s enumeration of the types of social capital is interesting and indeed not without controversy. Putnam (2002) distinguishes between “bonding” and “bridging” social capital, arguing that the former “brings people together who are like one-another in important respects (ethnicity, age, gender, social class, and so on),”

whereas the latter “brings together people who are unlike one-another.” It seems intuitive to suggest that Uslaner’s generalized trust should be related to Putnam’s bridging social capital and that his particularized trust should go hand-in-hand with Putnam’s bonding, but the mechanism behind these relationships is the point of contention between the two authors. For Putnam, generalized trust may be built via repeated interactions with strangers who are unlike oneself through bridging social capital, while Uslaner argues that this causality must be reversed: for him, generalized trust is a necessary precondition for one to engage in bridging social capital in the first place.

This controversy matters not for the theory presented later in this chapter, but it should be pointed out to avoid accusations of conflating the concepts and sacrificing clarity. To be clear, the argument herein remains agnostic as to whether generalized trust may be built through interaction, but it does take the stance that trust has independent causal force and as such is, at least on average, somewhat resistant to change (more of a “trait” than a “state” in the language of Crepaz (2008)), which may prompt many observers to place it closer to the Uslaner camp.

2.3.2 EXTANT WORK ON SOCIAL CAPITAL AND INTEGRATION

Before continuing the discussion of our theory and primary hypothesis, it is useful to situate the notion of social capital and trust as contextual determinants of integration in the broader literature on the subject.

We left our earlier discussion concerning the major theories of integration with the assertion that social capital is the common thread that binds them all together. But this is not simply one author’s understanding. In fact, Philips & Fishman (2006, 491) argue as well that “the proposition underlying all theories of assimilation concerns the nature of the relationship between ethnic capital [i.e., social and human capital within the immigrant group -RWD] and length of residency.” In particular, they point out that the “straight-line” theories of integration (Warner & Srole 1945, Wirth 1929) argue that within-group social capital declines

steadily until the immigrant group as a social unit ceases to exist as a salient entity. Similarly, the aforementioned “ethnic revivalists” (Glazer & Moynihan 1964, Greeley 1971, Novak 1972) may be seen as positing that within-group social capital loses salience in the second generation but returns to prominence in the third and beyond, thus limiting the group’s integration potential. Both of these schools of thought tend to tie the existence of the immigrant group’s social capital to the very *ethnic identities* of its members, seeing the presence of the former as indicative of the saliency of the latter. The so-called “bumpy-line” theories (Gans 1992a), however, break this tie and argue that group members may revive their interest in within-group social capital as a merely *symbolic* representation of their ethnic identity that does not have great influence over their social, political, and economic lives—and thus does not hinder their ability to integrate into their host society (Alba 1990, Gans 1979, Lieberman & Waters 1988, Waters 1990).

Within-group social capital is thus a key component of all of the main schools of thought regarding integration processes. This in itself is interesting, as it illustrates the usefulness of the concept. However, it is once again striking that only one level is considered: social capital has only been studied—and theorized about—within the immigrant groups. The existence of social capital in the host society has simply not been considered as a factor in integration outcomes (see, for example, Sanders & Nee 1987, Borjas 1992, Portes & Zhou 1994, Bankston & Zhou 1995, Borjas 1995, Borjas 1999, Ebaugh & Curry 2000, Nee & Sanders 2001, Djajic 2003, Constant & Massey 2003, Philips & Fishman 2006, Svendsen 2006). Even Portes & Sensenbrenner (1993), widely cited as having contributed to the understanding of the “structural determinants” of immigrant integration, speak solely of the structures that exist at the level of the immigrant group itself.

That said, there are indeed allusions in the extant literature to situations in which the presence of social capital and trust in the host society may intervene to moderate integration processes. For instance, Portes & Sensenbrenner (1993) argue that the greater the social and cultural distance of the immigrant groups from the native members of the host

society, the stronger the within-group solidarity will become. This occurs because greater distance increases the likelihood of nativist resentment (and the prejudice and discrimination that comes along with it (Portes & Zhou 1994)), and the immigrant groups respond by strengthening their within-group ties to ensure their continued esteem and survival. Greater within-group focus negatively affects integration (Djajic 2003).

But social capital and trust in the host society can prevent this scenario from unfolding because it acts to inhibit the formation of the nativist resentment, prejudice, and discrimination that are at its root. Trusters are known to be more tolerant and less xenophobic than non-trusters (Inglehart 1997, 89–90), and more recently, both social capital in general and trust in particular have been shown to be associated specifically with more tolerant attitudes towards immigrants (Crepaz 2008, Herreros & Criado 2009).

Aggregate-level social capital may also intervene in other posited causal mechanisms. The lack of ability to exit the host society and return to the immigrants' country of origin has also been argued to increase within-group solidarity (Portes & Sensenbrenner 1993) and thus negatively affect integration (Djajic 2003). However, this again only occurs in the face of something from which one needs to flee (i.e., nativist resentment, prejudice, and/or discrimination (Portes & Zhou 1994)), so social capital in the host society may hamper such an outcome. Furthermore, nativist resentment itself has been argued to have independent causal force, working to limit immigrants' ability to integrate (Johnson, Farrell & Guinn 1997, Sanchez 1997). Simply put, social capital and trust can intervene and alter outcomes in any causal mechanism in which intolerance on the part of the natives in the host society is posited to play a role.

One might rightly wonder at this point how all these studies could have missed social capital as a host society-level determinant. The answer lies, at least in part, in the disciplinary training of the researchers. They are overwhelmingly from sociology and anthropology, and thus focus on group-level dynamics almost as a matter-of-fact. Their goal is most often to understand the processes at work within, not across societies (recall the earlier assertion that

the major schools of thought have focused on projecting the futures of immigrant societies rather than on specifying general theoretical constructs). Moreover, it can be of little doubt that the causal forces they point out *do* have the most immediate bearing on the subject at hand; that is, they are the most proximate. Indeed, some theorists attempt to disaggregate even group-level determinants. Sanders & Nee (1987), for example, suggest differentiating between immigrant bosses and immigrant employees within the “immigrant enclave” theory. But if our goal is to abstract to the level at which national policies are made, we must consider society-level factors. This is where political science can contribute as a discipline.

This discussion alone is enough to merit the inclusion of aggregate-level social capital and trust as determinants of integration outcomes; we now continue, however, with a more detailed specification of the proposed causal mechanisms involved in this relationship.

2.3.3 WHY TRUST MATTERS

First of all, it should be clarified that when we refer to trust, we are referring to generalized trust (GenTrust). The discussion of particularized trust (PartTrust) earlier was useful for defining GenTrust in relation to that concept, but it is GenTrust that matters most for immigrant integration, because it is GenTrust that underpins Putnam’s ‘bridging’ (as explained earlier).

The reason we needn’t concern ourselves with levels of PartTrust is quite simple. GenTrust and PartTrust are *not* opposites; they thus may not be accurately represented as opposing ends of a single continuum. Rather, they are best conceived as nested constructs. PartTrust is indicative of a smaller sphere of trust and is nested within GenTrust, which is a much larger sphere. One can conceivably have high values of both types of trust because they are not mutually exclusive. To give an example, there is nothing that prevents an immigrant from participating in an ethnically- or culturally-based credit union or using connections gained from his center of religious worship to get his first job (both of which use PartTrust)

while simultaneously extending his social networks to include a broader swath of his new society (drawing upon his GenTrust).

Because GenTrust is inclusive of PartTrust, exists independent of the latter's level, and underpins the sort of social capital (Putnam's 'bridging') that is most theoretically relevant, we may forego the measurement of PartTrust and focus on GenTrust as a matter of fact.

Hereafter, then, we shall use the terms 'trust,' 'generalized trust,' and 'social trust' interchangeably; this is merely a stylistic choice to avoid redundancy in the prose, and should not be taken as indicative of conceptual stretching. That said, we may proceed to the heart of the matter.

By itself, social trust is neither necessary nor sufficient for integration to occur; we do not argue that it performs a gatekeeping or permissive function. Rather, trust is better conceived as a catalyst for integration, speeding and facilitating movement along existing trajectories.

The key to understanding why this is so lies in the relationship between generalized social trust and bridging social capital as outlined above. Trusters are more likely to reach across ethnic and class lines because they do not fear the consequences of these interactions. It has been documented that trusters are less xenophobic in their attitudes toward others, for example (Inglehart 1997, 89–90). Because trusters have these characteristics, they will more easily forge the networks and foster the norms (social capital) with immigrants that will help them to integrate into their host societies.

But these effects need not be confined to the individual level. In the aggregate, as well, a society characterized by a greater proportion of trusters will provide an overall atmosphere that is more conducive to integration than one with less, as immigrants in the first will have more positive interpersonal interactions with natives, on average, than immigrants in the second.

Imagine two immigrants who have arrived in different societies, one characterized by a high proportion of trusters and the other not. Immigrant 1 (I_1 —in the more trusting society) will be less hesitant than Immigrant 2 (I_2 —in the less trusting society) to extend

his network beyond his ethnic or national group. Because he will not be as threatened by the dominant culture of the new society in which he finds himself, he will interact more easily with its inhabitants, perhaps even extending his social networks to include natives and thus more easily gaining tutelage from them regarding his new environs. These networks need not be particularly “thick” in Putnam’s (2002) terms; Granovetter (1973), after all, wrote specifically of “the strength of weak ties” when it comes to such practicalities as getting a job—something that would greatly aid in immigrant integration, especially if the job lies outside of one’s “ethnic enclave” (Wilson & Portes 1980). I_2 , being treated more cautiously and skeptically by the native population, will be less likely to extend his networks and thus will not reap the same benefits that I_1 will enjoy (or at least, certainly not to the same degree). In terms of our previously defined ‘integration’ concept, we might express that the ‘integration potential’ of I_1 is higher than that of I_2 . Given this, we would expect integration to be higher, *ceteris paribus*, in societies and/or locales with higher levels of generalized trust. This is our primary hypothesis.

H_1 : The more social capital and trust in a society, the more integrated will be the immigrants therein because the potential for “bridging” social networks is increased.

2.4 A POSSIBLE CRITICISM

There is a recent trend in the social capital literature that has argued that increasing diversity tends to depress social capital as well as generalized trust (e.g., Hero 2007). In fact, even Robert Putnam has grudgingly accepted this idea. In a rather dramatic about-face from his earlier position, he admitted in a lecture in 2007 that there was simply no way around the fact because all available data point to it (Putnam 2007).⁴ At first glance, this may seem to spell doom for the case made above for H_1 , as one may take it to mean that immigration and social

⁴This piece received quite a bit of attention in the popular press; for a particularly insightful example, see Leo (2007).

capital cannot coexist. But this argument deals with the generation of social capital over time (or rather its *destruction*), and although it may portend problems as diversity increases, this itself says nothing of the potential enhancement of integration by extant social capital in a host society. That is, this argument is not fundamentally incompatible with H_1 : one can make the argument that the social capital present in a society at the time of an immigrant's arrival may enhance his or her integration potential and yet acknowledge the possibility that as more and more immigrant groups arrive and the aggregate diversity of the host society increases, stocks of social capital may be reduced. In fact, the two arguments may be seen as complementary, portending problems for integration as diversity increases, at least in the short to medium term.

The notion that social capital decreases as diversity increases is based on the refutation of the longstanding “contact hypothesis,” of which Robert Putnam (prior to 2007, at any rate) has been perhaps the most influential and recent proponent. This hypothesis argues that the more different peoples interact (Putnam has said that this interaction occurs primarily through civic associations with inclusive memberships), the more they will build ‘bridging’ social capital and trust across their once-salient lines of difference. Again, it may seem that a refutation of this idea must entail a refutation of precisely the argument behind H_1 , but this is simply not the case.

Rather than arguing that mere contact between immigrants and natives is sufficient for bridging social capital formation (as the contact hypothesis holds), we argue that existing social capital on the aggregate level in the host society is a *prerequisite* for this to occur—that is, it is necessary but not sufficient for the contact hypothesis to hold.

Put another way, the contact hypothesis argues that repeated interaction between immigrants and natives is sufficient in itself to forge the bonds that ‘bridge’ across their differences and thus build generalized trust. Moreover, it argues for “spillover” effects that extend to groups with whom one may never have had contact before. The argument for H_1 is that interaction alone is insufficient; there must be existing social capital in the host society in

order for the contact hypothesis to hold, because it is necessary to explain positive synthesis between the natives and the immigrant groups in the first instance, before repeated interaction has occurred and reputational and other effects can factor in—in effect, it denies the existence of the aforementioned “spillover” effects. Preexisting social capital is thus viewed as a permissive component that allows (more) bridging social capital to form.

If contact between unlike groups occurs in an environment characterized in the aggregate by social capital and generalized trust, there may be synergistic effects leading to the generation of bridging social capital; if this contact occurs in an environment in which little social capital and trust exist to begin with, the result may be a lack of bridges built—or worse, over time, the *destruction* of any existing bridges across differences (if bonding social capital increases in the absence of bridging, perhaps catalyzed by a downturn in the economy and/or political entrepreneurship). Because the argument behind H_1 denies spillover effects, its apparent incompatibility with the theory that diversity leads to lower levels of social capital (which also denies spillover effects) evaporates under scrutiny.

Not only are they compatible, in fact, they may well be complementary. Societies are living things, always in motion, ever changing. If both of these ideas survive empirical testing, it would suggest that there is a “tipping point,” a rate of immigrant influx at which the resulting diversity overpowers the ability of the host society’s existing social capital to absorb it, thus proving detrimental to integration. Unfortunately, the existing data are not amenable to testing such an intricate argument based on change over time. This may be a promising area for future research; for the present purposes, it suffices to point out that Putnam’s (2007) argument poses no threat to our own.

2.5 ALTERNATIVE HYPOTHESES: MULTICULTURALISM AND THE WELFARE STATE

2.5.1 MULTICULTURALISM

Multiculturalist policies are those designed with the accommodation of group-level differences in mind. Examples may include laws that make specific allowances for ethnic holidays

or ethnic styles of dress in the workplace, that allow dual citizenship, or that provide government funding for ethnic group-based cultural organizations or bilingual education (Banting, Johnston, Kymlicka & Soroka 2006). There is much controversy surrounding such policies in the literature, particularly with regard to their posited effects on integration; the arguments are normative in nature and the disagreements are on philosophical grounds. Two major schools of thought have developed from these debates.

“Universal liberals” argue that states should be neutral or blind to cultural differences, with the declared goal of equality for all. They worry that by actively promoting and sustaining differences, multiculturalism may fragment the civic, political, and even moral communities that underpin a society, creating numerous social problems (Barry 2001, Gitlin 1995, Huntington 2004, Okin 1999, Pickus 2005, Schlesinger 1998). Philosophically, they argue that a group-based conception of equality undermines the equality of individuals because it leads to unequal treatment under the law depending on one’s group membership. This lack of individual equality can itself become a subject of resentment for the natives of the host society, thus increasing the risk of prejudice and discrimination against the immigrant groups, which can reduce the likelihood of their integration. Furthermore, as noted earlier, two of the three major strands of integration theory implicitly connect within-group social capital to the identities of the group members, arguing that greater cultural and social distance from the natives in the host society results in less integration. If this be so, then by accommodating these differences, multiculturalism may perpetuate them—and if they are salient to the social, political, and economic lives of the group members, they can reduce the group’s integration potential and increase the risk of group members remaining in an “immigrant enclave” (Wilson & Portes 1980). This leads us to formulate our first alternative hypothesis.

The universal liberalist hypothesis, H_{A1} : More multiculturalism leads to less integration because it encourages immigrant isolation and increases the indignance of the native-born vis-a-vis the foreigners.

Proponents of multiculturalism, of course, have a somewhat different take on the subject. They argue that it is impossible for a society to be culturally neutral and treat individuals as disembodied from their groups (as universal liberals prescribe) because all countries have a core culture that places minority groups in a position of cultural inequality (Kymlicka 1995, Kymlicka 2001, Shachar 2000, Shachar 2001). This is damaging to the integration of immigrants, they say, because it leads to inequalities regarding their rights and thus their participation in the public sphere. In order to avoid these problems, advocates of multiculturalism call instead for the active recognition and accommodation of cultural minorities through state policies (Kymlicka 1995, Kymlicka 2001, Kymlicka & Norman 1994, Parekh 2006, Taylor 1994). Rather than seeing the state promotion of group identity as isolating immigrant groups, multiculturalists see it as being necessary precisely in order to allow them to participate more fully in the host society. Moreover, they see the engagement that results from such policies as solidifying, rather than deteriorating, the bonds of social solidarity. In the words of Kymlicka (2001, 36), “it is the absence of minority rights which erodes the bonds of civic solidarity.”

This way of thinking is more compatible with the third school of thought regarding integration, the “bumpy-line” theories (Gans 1992*a*), because it tends to see within-group social solidarity as innocuous to, rather than restrictive of, integration. Multiculturalists certainly consider group membership as salient to social, political, and economic outcomes, but they see state recognition and promotion of that membership as mitigating the balkanizing tendencies typically associated with a high saliency of ethnic identity. Open acceptance and accommodation of differences, they say, reduces their destructive potential. This leads us to our second alternative hypothesis.

The multiculturalist hypothesis, H_{A2} : More multiculturalism leads to more integration because it promotes the equality of immigrants vis-a-vis members of the host society.

Put simply, universal liberals emphasize individual rights, while multiculturalists offer a group-based conception, seeing the individual as embedded in a cultural context that gives meaning.

2.5.2 THE WELFARE STATE

There are also competing arguments with respect to the effect of the welfare state on integration. Morissens & Sainsbury (2005) take the stance that more ‘decommodifying’ welfare states (those that more insulate one’s life chances from the vagaries of the market) should aid immigrant integration by improving their economic status vis-a-vis natives. Greater redistribution means a flatter distribution of wealth, and a more level playing field benefits immigrants by enhancing their ability to participate in their host societies socially, politically, and economically. This perspective emphasizes the material aspects of the welfare state.

Taking a somewhat different tack, Crepaz & Damron (2009) focus on attitudes about immigrants and how these may be shaped by different types of welfare institutions. They conclude that more generous, universal welfare states tend to foster attitudes of inclusiveness (which would aid integration), while means-tested systems foster the labeling of in-groups and out-groups and the tensions that accompany such distinctions (thus harming it). This perspective emphasizes the attitudinal aspects of the welfare state. We can summarize both of these perspectives in a third alternative hypothesis.

The welfare equality hypothesis, H_{A3} : More universal, “decommodifying” welfare states lead to more integration because they promote the equality of immigrants vis-a-vis members of the host society.

On the other side of the debate, scholars such as Ruud Koopmans (2008, 2010) take issue with these arguments. In his most recent work (2010), he gives three reasons why he believes that precisely the opposite should be the case. Drawing from the work of Borjas (1989), Chiswick & Miller (1995), and Gurr (1970), he makes the case that (1) more generous

welfare states actually attract just the sort of immigrants who are least likely to integrate because they have less education and thus a weaker labor market position, (2) that generous welfare states provide disincentives for learning the language of one's new society and/or acquiring new skills for employment because one has no need for such things when the bills are paid by the state, and that (3) the fact that all deprivation is relative means that for immigrants coming from poorer locales, living on the 'minimum' provided by the welfare state may actually represent a significant improvement over their previous status, thus increasing the attractiveness of staying on welfare. This leads us to our fourth alternative hypothesis.

The welfare disincentive hypothesis, H_{A4} : More universal, "decommodifying" welfare states lead to less integration because they reduce the incentives for immigrants to integrate.

Having thus developed the theory through which we hope to generate new knowledge and reviewed the extant controversies in the literature to which we expect to contribute, we turn our attention now to the conceptualization and measurement of integration, our dependent variable.

CHAPTER 3

MEASURING IMMIGRANT INTEGRATION: A NEURAL NETWORK APPROACH

As we have seen in the previous chapter, there has been much theorizing on the subject of integration. In spite of the fact that the arguments are strong and the cases well-made, the field is characterized by a paucity of statistical studies.¹ Indeed, writing in April of 2008 for the Annual Review of Sociology, Bloemraad et al. put it thus:

Future research needs to address the gap between philosophy and practice because the paucity of empirical studies allows political actors on all sides to make strong claims based on little evidence (Bloemraad, Korteweg & Yurdakul 2008).

This chapter prepares to take some steps toward filling that void. Herein, we detail the rationale for and construction of a novel, cross-nationally comparable measurement of our dependent variable, the degree to which immigrants are integrated into their host societies. As a first step, we will focus on the case with which many of us are most familiar and will construct our measure with an eye toward comparing across states in the United States. We begin, however, with a discussion of existing measurement strategies.

3.1 PREVIOUS WORK

Studies of integration tend to be qualitative, owing to the richness of the concept and the difficulty of obtaining quantitative data.² Most studies that do attempt to measure integration rely on relatively blunt instruments such as labor market participation or residential

¹There are good reasons for this, as it turns out, and we will deal with them throughout our investigations.

²Even those studies that employ quantitative data from surveys and other sources generally do so in a qualitative fashion, presenting different variables in tables and not constructing an omnibus measure for use in quantitative analyses (e.g., Phalet & Swyngedouw 2003).

segregation (e.g., Raijman & Semyonov 1995, Koopmans 2008, Koopmans 2010). There is, however, one study that stands out in the field for its innovation and thoroughness. Reinsch (2002) is by far the most detailed work to date in this regard, and he constructs a fascinating quantitative index measure of integration.³ His analysis is quite useful in illuminating issues regarding the measurement of the concept, but the measurement itself is not very generalizable because it is rooted in a very rich understanding of the community in which it was constructed and is tailored to be germane to Dutch policy debates.

We seek to avoid these pitfalls and construct a measure that occupies a middle ground, one that is detailed enough to be useful but general enough to be more broadly available and applicable.

3.2 CONCEPTUALIZING INTEGRATION

In the previous chapter, we defined integration as the process by which immigrants become similar to the native population, as a group-level phenomenon that may take place over multiple generations. Accepting this notion of integration as similarity, however, yields some interesting features. With regard to certain characteristics, one can easily compare one immigrant to another and tell which is better integrated. In the United States, if one sees an immigrant who speaks English more proficiently than another immigrant, it is commonsensical to posit that the former is more ‘integrated’ with respect to that indicator because the better one speaks English, the more one is like a native member of the host society. Things become somewhat less clear when dealing with indicators such as income, however. In this case, one cannot say that an immigrant is more integrated than another simply because he or she has a higher income. What is germane in this case is not the income level of any *single* immigrant, but the degree to which the *distribution* of incomes across some group of immigrants (however this group is defined) is congruent with the distribution of incomes

³For a fascinatingly elaborate graphical representation of the complexity of his construction, see Figure 2.1 on page 62 in Reinsch’s book. It is appropriately entitled, “Parametric concepts within the construct of immigrant integration.”

across the native population of the host society. Continuing with our US example, we might be interested in comparing the distribution of incomes across the group of all immigrants from Mexico to that of all native-born citizens of the US in order to gauge the level of integration of Mexican immigrants with regard to income. In broad terms, this conception parallels that of Joppke & Morawska (2003), who argue that immigrants “are conceptually assimilated to other individuals and groupings with similar positions on some critical indices or indicators...”

Conceiving of integration as similarity also means acknowledging that the characteristics of the members of the host society change over time, and as these are the point of reference for the concept, this acknowledgment imbues it with a certain dynamic quality.

3.3 A STRATEGY FOR MEASUREMENT

We now have three key characteristics of the phenomenon of integration that a measurement must take into account. First, it concerns assessing the degree to which the natives of a society differ from those who have come from elsewhere. Second, the phenomenon is a group-level one, involving the comparison of distributions of indicator variables. Finally, it is dynamic in that the characteristics of both the group members (immigrants) and the reference population (natives) change over time.

The first of these characteristics suggests a core strategy for measurement. Since the comparison is to be made between natives and foreigners, it makes sense to construct a model that will predict whether an individual is native- or foreign-born based on the indicators discussed earlier (e.g., education, income, and home ownership with regard to the economic dimension of integration). To the degree that the model has difficulty distinguishing between the native- and foreign-born in a particular society, the latter may be said to be ‘integrated’ into that society, for they are more similar with respect to the indicators included in the model. If the model easily distinguishes between these groups, then they are more dissimilar in terms of the indicators, and the foreign-born are thus less integrated.

This seems to be an intuitive way to proceed, but difficulties arise when we attempt to specify the type of model that ought to be used. These difficulties stem from the distributional nature of the integration concept and the fact that these distributions cannot be specified *a priori*. What is required is a nonparametric, nonlinear technique that can perform something similar to (albeit not precisely the same as) a direct comparison of distributions because it is unfettered by assumptions commonly imposed in statistical analyses.

The field of artificial intelligence (also known as machine learning) offers a class of models that meet these specifications: they are known as artificial neural networks (ANNs).

3.4 INTRODUCING NEURAL NETWORKS

Artificial neural networks were created to mimic the function of the human brain; they consist of logical processing units (“neurons”) that propagate a signal (“fire”) based on their inputs coupled with an activation function; these neurons are connected via weights (“synapses”) that are adjusted (“trained”) by a learning algorithm. They excel at classification tasks, and if you have ever “trained” voice recognition software on your personal computer, used spoken commands to access a menu over the phone (in lieu of touch tones), or scanned a document using optical character recognition (OCR), you have probably used one.⁴

ANNs are quite versatile and adaptable, allowing for innumerable combinations of structural topologies, training algorithms, and other features. In order to see how they actually work, we will examine one that is similar to that used in this paper.⁵ We will first examine the structure of the network in order to clarify the terms (neurons, weights, etc.) used above. We will then use the structure to explain the assumptions made by the model (or more

⁴The astute observer will note that the ANNs in each of these examples are used to process data that have not previously been made available to them (that is, they are used to make out-of-sample predictions). This is no accident; we will examine this aspect of neural nets in more detail in a moment.

⁵In technical terminology, we will consider only the relatively simple case of a feed-forward multilayer perceptron with a single hidden layer and a logistic activation function, trained via supervised learning with a backpropagation algorithm. If you know what this means, you may wish to skip the rest of this section; otherwise, you may wish to read on as I attempt to illuminate the jargon.

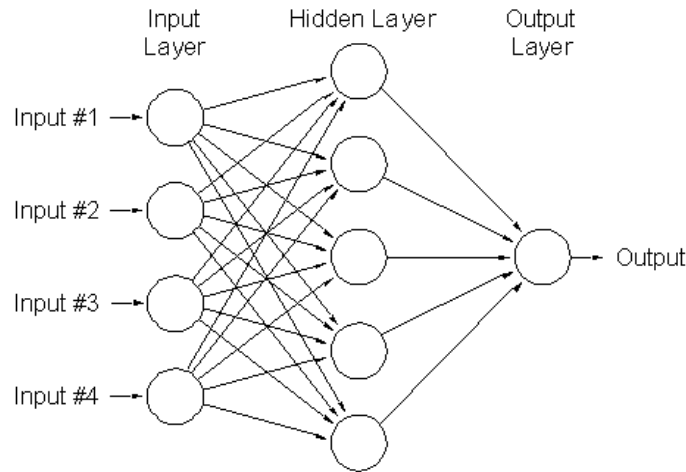


Figure 3.1: The Multilayer Perceptron

precisely, the lack thereof). Finally, we will consider how the network is trained, and to what end.

Figure 3.1 shows an artificial neural network of the multilayer perceptron (MLP) type. This particular ANN is a 4-5-1 network, having three layers consisting of four inputs, five hidden-layer neurons, and one output. Reading the diagram from left to right, the inputs are preprocessed (more on that in a moment), then fed into the input layer with their values intact (unweighted). From there, they move into the hidden layer for processing via weighted connections. The hidden-layer neurons then process the inputs with their activation function, then send the results to the output layer via a second round of weighted connections. The fact that each input is fed to all of the hidden-layer neurons is what gives the model its nonlinearity. If one could imagine keeping only the topmost hidden-layer neuron in the figure, for example, each input would have only a single weight; and if the activation function

for that hidden-layer neuron were to be the logit function, the weights would be log-odds coefficients and the model would behave just as a logistic regression.⁶

It bears stressing that when I speak of nonlinearity here, this pertains to much more than just the link function employed (e.g., the nonlinear transformation used in a conventional logit or probit model); it actually applies to the functional forms of the variables, as well. Because neural nets fit a k -dimensional *decision surface* rather than a hyperplane, they can specify nonlinear functional forms for the predictor variables (e.g., x^2 or x^3). These are “learned” during the training process and need not be specified by the researcher.

ANNs lack other assumptions, as well. Multicollinearity is not a problem for an ANN, generally speaking, as the model simply “learns” which weights are more or less important during the training process. Neither is an assumption made regarding full model specification (that the model contains all germane independent variables). Normally, this assumption is made to ensure that the errors are distributed randomly (that is, that any variation remaining in the dependent variable after all the independent variables have been controlled for is random noise). This is important to ensure desirable statistical properties of the estimators, but statistical inference is not the goal here; we seek to create a measurement. By not making these assumptions, ANNs generate the best possible predictions given the data at hand, period.

3.4.1 TRAINING AND VALIDATION

Several times above, we have alluded to the process of “training” the network. What does this mean, and how is it accomplished?

Training is the process by which the weights are adjusted in a neural network such that some criteria is optimized. There are several ways to optimize a model. We will begin with the simplest of these, a process known as holdout validation.

⁶There are a few more “ifs” that need to be included in this statement to make it *absolutely* accurate (e.g., “if” no bias is included, “if” there is no transfer function implemented in the output layer, etc.); these have been omitted for simplicity’s sake.

In holdout validation, the pool of available data is split into two distinct datasets, one for training and one for validation (also called “verification”). Typically, the ratio is 4:1 or 80%/20%, meaning that 80% of the data are used for training and 20% for validation. The network begins with a set of randomly-generated weights, then adjusts these as it runs downward through the rows of data to hone its predictions of the dependent variable.⁷ As the model trains, its error rate of prediction for the training data goes to zero.

This minimization of prediction error *is* what we want, but we must be very careful. Recall from earlier that ANNs make no assumptions regarding the distributions of the independent variables or their functional forms. This we touted as being a great strength of theirs, as it frees the model of constraints, allowing it to make very precise predictions. It is precisely this power and flexibility that leads us to our present concern, however. If the data are noisy (and they often are, particularly in the social sciences), the model may actually begin to fit the noise as it goes through its training. If one were to regard only the reduction of error achieved through training, one might have the impression that the model has been quite well-optimized. But if it has been *overfitted*, it might actually be *less* useful at predicting out-of-sample data than it would have been had training been halted earlier, before the fitting of the noise in the training data began.

Enter the validation data. Since these data have been separated from the training data, they may be used as a check on the training process in order to prevent overfitting. As the network is trained, it is also run on the validation dataset and its error rate of prediction on those data calculated. At the point that this error begins to increase, the training process is stopped. In this way, the likelihood of overfitting can be drastically reduced.

Separating the training and validation datasets serves another purpose, as well. An ANN can learn much through the training process, but there are some parameters that must be specified prior to training. These include the number of hidden-layer neurons and a parameter

⁷The magnitude and direction of these adjustments are determined by the learning algorithm employed. We use the commonly employed backpropagation algorithm for all models, but do not describe it in detail here. For more information on this and other algorithms, see Garson (1998).

called the weight decay (also known as the gamma parameter), which adds a penalty to the error function in order to increase the generalizability of the final model.⁸ Using the previous example from Figure 4.1, how did we know to specify five hidden-layer neurons instead of four or six? In short, we did not know; these parameters must be optimized by trial and error. We program the network to run many iterations, each with different combinations of parameter values, then calculate the sum of squared errors for each model parameterization on the validation dataset. Finally, we choose the set of parameters that minimizes that sum of squared errors (the one from the validation data).

This may all sound very data-driven, perhaps even atheoretical; it is. But it is crucial to bear in mind that the goal here is not statistical inference; rather, it is the construction of a measurement, and that measurement requires simply that the predictions generated from the model be as accurate as possible given the indicators chosen. Due to its lack of limiting assumptions, an artificial neural network is better suited for this purpose than any standard statistical model.

3.5 NUTS AND BOLTS: CREATING THE MEASURE

Bearing in mind the characteristics and logic of ANNs of the multilayer perceptron type, we may now proceed with a discussion of how the actual measurement is constructed.

In fact, the measurement has been constructed in a manner broadly similar to that undertaken in May 2008 by Jacob Vigdor (Vigdor 2008). The primary differences are that he used a probit model for his predictions, his dependent (output) variable was different, he used different data sources, and his measurement was constructed only for the U.S. case, thus not allowing cross-national comparisons. His analytical reasoning was similar, however.

⁸A full discussion of weight decay is beyond the scope of this discussion; please see Ripley (2008) for more information.

3.5.1 DATA

First, we need to find a data source that has information about both the proposed output (dependent) variable and some useful input (independent) variables for use in predicting it. Since we are interested in assessing the ability of the model to discern native- from foreign-born individuals, this is our output variable. We also need the data to contain as many cases as possible, since the ANN requires a great deal of data for training and validation, and to be widely available across countries, since this is where our theoretical interests lie.

An ideal data source in these regards is the Integrated Public Use Microdata Series (IPUMS) International project at the University of Minnesota (Center 2009). It contains cross-nationally harmonized subsamples (typically in the three to five percent range) of census data for numerous countries and years. For practical purposes regarding temporal congruence with other variables we wish to use in subsequent statistical analyses, we have chosen to use the IPUMS data for multiple countries nearest the year 2000.

Three versions of the measurement have actually been constructed, each for use in different subsequent analyses. The first two are cross-national in scope, while the third is a US-only measure used for comparison across US states. Owing to limitations imposed by other variables in the cross-national statistical analyses, two measures were constructed in that realm, each with a different slate of predictors.⁹ The first cross-national measure is the Least Common Denominator (LCD) measure, and was created with an eye toward maximizing the number of country samples available for comparison; it contains primarily economic predictors. The second contains a more extensive list of predictors, including some more culturally-relevant ones; it is called the Household-Dependent (HHD) measure because its additional variables required that the census data be organized by household, which further limited the available cases. The US measure has the most extensive list of predictors,

⁹We will revisit these measures and their development in the next chapter as we analyze how multicultural policies, welfare state extensiveness, and social trust (among other things) affect the integration of immigrants across different country contexts.

as cross-national harmonization of the variables was not a concern. The predictors used in each of these are described in Table 3.1.

Also of note is the fact that the universe of cases has been limited to those aged 25 to 65; this is a key substantive concern, as this (1) follows standard demographic categories and (2) excludes the demographic groups that are the least theoretically interesting, as those from 18 to 24 generally participate less politically and may have yet to complete their educations and those over 65 tend not to be in the labor force and tend to be disproportionately politically active. Again, it is important to keep in mind that the measurement is intended to be representative of the broadest swath of society possible.

The remainder of our discussion will focus on the third measure, the one constructed for the US case, as we will discuss the other two at length in the next chapter. It is also a more intuitive case for exposition, since it concerns the country that is most familiar to most of the audience.

Now that we have chosen census data indicators that substantive theory would predict might meaningfully distinguish between native- and foreign-born individuals, we may proceed to the next step: choosing the aggregation variables for sampling.

3.5.2 THE AGGREGATION VARIABLES AND SAMPLING

Recall from the earlier discussion of the distributional nature of the concept of integration that it is a group-level phenomenon. Since the ANN will generate a predicted probability that an *individual* is foreign-born (because foreign-born is coded as 1, native-born as 0), we must aggregate these in some theoretically meaningful way to reflect the groups across which we would like to compare. In this case, we have chosen the birth country of the foreign-born respondent, nested within the current US state of residence. Setting up the groups in this way will allow us to compare, say, those immigrants who were born in Mexico and now live in Texas to those who were born in Mexico and now live in Georgia. We can

Measure of Integration	Least Common Denominator (LCD)	Household-Dependent (HHD)	United States (US)
Predictors	Age (Limited to 25 to 65)	All those of the LCD measure, plus:	All those of the HHD measure (with more categories where available), plus:
	Marital Status (4 category)	Number of Persons in Household	Number of Automobiles Available for Use
	Employment Status (3 category)	Number of Unrelated Persons in Household	Number of Hours Worked Per Week
	Occupation, ISCO (10 category)	Ownership of Dwelling (2 category)	Number of Years Residing in Current Dwelling
	Industry, General Recode (15 category)	Number of Rooms in Dwelling	Total Income
	Class of Worker, General Recode (4 category)	Number of Families in Household	
		Number of Married Couples in Household	
		Number of Mothers in Household	
		Number of Fathers in Household	
		Number of Own Children in Household	
		Citizenship Status, Head of Household (2 category)	
		Citizenship Status, Father (2 category)	
		Citizenship Status, Mother (2 category)	
		Citizenship Status, Spouse (2 category)	
<i>N</i> (before sampling)	24,239,184 individuals in 9 countries	9,463,988 individuals in 5 countries	5,738,224 individuals in 28 states of 1 country

Table 3.1: Predictors Used in Constructing Integration Measures

thus ascertain the differential effects of state-level policies, institutions, and even popular attitudes regarding immigrants on their integration.

Once we have chosen the aggregation variables, we must sample based on them to compose the master dataset, the one from which the training and validation sets will be derived. There are a couple of key concerns here, stemming from the structure and logic of the ANN model.

First, we must maintain equal numbers of native-born and foreign-born persons in each of the groups. We must do this in order to ensure that the model will converge to a predicted probability of 0.5 when the data are not helpful in making a prediction. Like a conventional logit or probit model, the ANN will set its “best guess” at the mean of the output (dependent) variable if the data do not improve its ability to make a prediction. The mean of a binary variable is equal to the percentage of the number of ones, so the samples must be composed of 50% ones (foreign-born) and 50% zeroes (native-born) in each group in order to ensure this outcome.

Second, we must maintain equal numbers of individuals across the groups. This is because if one group is more numerous than others in the data, the learning algorithm will give its characteristics greater consideration than those of less numerous groups when modifying the network weights during the training process. In order to ensure that differences in the predicted probabilities for less numerous groups are due solely to differences in the ability of the ANN to discern between the foreign- and native-born and *not* due to differences arising from an artifact of the training process, we must equalize the number of individual cases across groups. We do this by taking the group with the lowest number of individuals and sampling that number of individuals from all other groups in the data. For example, if we have 1000 people of Mexican origin (the birth country) in Texas (the US state of residence), but only 100 people of Korean origin in New Jersey (and this is the smallest group we have in the data), then we would keep all of the available Koreans in New Jersey, but take a sample of 100 Mexicans from Texas. In this way, we maintain balanced panels.

To perform these feats without biasing the results, we use stratified random sampling to build the master dataset. In order to illustrate, I have included frequency data for two states broken down by our chosen aggregation variables in Table 3.2.

Note that not only are the numbers of individuals the same across birth groups within states, but they are also equivalent across states. This is because the number of groups across states has also been equalized for the same reasons just described. Note also that the 990 native-born individuals compose exactly 50% of the sample for each state. The full dataset contains data for 99 individuals in each of 10 immigrant groups in each of 28 US states, for a total of 280 immigrant groups containing 27,720 individual immigrants.

The next step is preprocessing, as the data must be properly formatted for the ANN. Unordered categorical variables must be split into binary (dummy) variables, and all of the resulting variables may be kept in the model (there is no need to leave one out to create a “base category” as in other statistical models, since colinearity is generally not a problem in ANNs). Count (Poisson) variables are treated in the same manner, particularly where the top category is open (e.g., the highest category in “number of own children in household” is “9 or more”). Finally, the continuous (or approximately continuous) variables (e.g., income in currency units) must be standardized to mean 0 and standard deviation 1.

Now we are set to split the master dataset into training and validation datasets. This is again done via stratified random sampling in order to avoid any potential bias. As mentioned in the earlier discussion of holdout validation, the master dataset is split 80% for training and 20% for validation. Because the training and validation data must be arranged identically, however, the sampling unit must be the previously-determined group. For example, if we have 100 individuals in each US state-birth country group, then we would randomly sample 80 from each group for the training dataset; the remaining 20 would be used for validation.

The final step in data management is to randomize the order of the cases in both the training and validation sets. This must be done because ANNs learn sequentially as they move downward through the rows of the training data, so cases that come later in the data

US State	Birth Country	Number of Individuals	Percentage of Cases Within State
Arizona	Mexico	99	5
	Canada	99	5
	United States	990	50
	China	99	5
	Japan	99	5
	Korea	99	5
	India	99	5
	Philippines	99	5
	Vietnam	99	5
	United Kingdom	99	5
	Germany	99	5
	Total	1980	100
California	El Salvador	99	5
	Guatamala	99	5
	Mexico	99	5
	United States	990	50
	China	99	5
	Taiwan	99	5
	Korea	99	5
	India	99	5
	Iran	99	5
	Philippines	99	5
	Vietnam	99	5
	Total	1980	100

Table 3.2: Sample Frequency Counts by US State and Country of Birth

may undo the effects of those that came before; this would be particularly problematic for our purposes since at this point the data are sorted by birth country group within US state. The order is randomized three times over using different seed values for the random number generator each time and tests are performed to confirm that the data are well-mixed.

At this point, we are ready to run some actual neural nets.

3.5.3 SEARCHING FOR OPTIMAL MODEL PARAMETERS

As described earlier, we must run multiple neural networks with various combinations of parameters, then choose the one that produces the lowest sum of squared errors when run on the validation dataset. We must specify the ranges over which to search for these parameters, however, and these are described in this section.

First, we set the range for the possible number of hidden-layer neurons (HLNs) to 1 to 10. Five HLNs are generally sufficient for most classification tasks, according to Garson (1998), so we double this in order to be conservative. It bears repeating that the more HLNs the model requires for optimality, the more substantial are the nonlinearities in the data.

For each of the ten different neural nets specified above, we run three different parameterizations of the weight decay. Here, we defer to the expertise of others and use the values advocated by Ripley (2008) : 0.0001, 0.001, and 0.01.

For each of these thirty different neural nets (10 HLNs times 3 weight decay values), we run 10 iterations, each with a different initial random state for the weights. We must do this because the initial random values generated for the weights can affect the final sum of squared errors (SSE) achieved by the trained model. In order to lessen the effect of this artifact, we run 10 iterations of each model specification, then take the mean of the 10 resulting SSEs. The optimal model is the one that has the lowest mean SSE.

Overall, then, 300 ANNs are run in the search for the optimal model, a process which takes 10 to 16 hours (depending on the number of predictor variables used) on a machine with 4 GB of RAM and a 2.0 Ghz dual-core processor running R in its native Linux environment.

3.5.4 GENERATING THE INTEGRATION SCORES

Once the optimal model is identified (a model with 4 HLN and a weight decay of 0.01 in this case), it is run 10 times (again each with a different random initial state) on the validation data. The predicted values (the probabilities of individuals being foreign-born) are collected from each run. For each individual in the validation data, the mean of the ten predicted values is taken. Using the fact that a perfect *inability* to distinguish between native- and foreign-born is a score of 0.5, these individual mean predicted probabilities are converted to the final integration scores as follows:

First, the individual predicted probabilities are aggregated by computing the mean at the level of the chosen aggregation variables (in this case, the level of the birth country group within the US state of residence—e.g., across those living in Texas who were born in Mexico versus those living in Georgia who were born in Mexico).

Next, this group-level mean is converted to an integration score using the formula $2 \times [100 - (100 \times x)]$, where x is the mean group predicted probability. This yields a score that equals 0 if the model perfectly discriminates between natives and immigrants (no integration) and 100 if it cannot discriminate at all (full integration—because the model will yield a predicted probability of 0.5 if the input variables do not aid in prediction). For example, if the ANN is, on average (recall that the mean of the individual scores has been taken), 90% certain that people of Mexican origin living in Texas are foreign-born based on their values on the input variables, the integration score for that group would be $2 \times [100 - (100 \times 0.9)] = 20$, a low score reflective of the high degree of certainty with which the model discriminates between members of that group and native-born persons living in the same US state.

3.6 ASSESSING THE MEASUREMENT

Table 3.3 contains group integration score values for foreigners born in our two nearest neighbors, Mexico and Canada, across all states for which there is enough data on these groups to compute scores. At first glance, the numbers seem reasonable enough. Immigrants

from Mexico are more integrated in California than in Texas, for example, and immigrants from Canada are more integrated than those from Mexico in almost all states for which we have data on both groups. But what is happening in Florida, where Canadians are moderately *less* integrated than their Mexican counterparts?

This apparent oddity points up an interesting feature of this measurement approach, namely its inability to distinguish positive from negative skews in the distributions of indicator variables. For example, if we look at income and/or employment type as indicator variables, this approach does not distinguish between immigrants who have lower incomes or lower-class jobs than natives and those who have higher incomes or higher-class jobs than natives. Instead, it assigns both groups an equally low integration score *because all the model sees is that knowing the level of income or the type of employment allows one to separate native- from foreign-born more effectively*. So how does this apply to the Florida case?

For the sake of simplicity, let us examine this case with respect to a single indicator: income. Florida has a larger than average retirement community. This produces a selection effect when it comes to Canadian immigrants, as those who move to Florida are likely more affluent than those who do not. The end result: Canadians in Florida appear less integrated than Mexicans there because the distribution of their incomes is skewed *higher* than that of Florida natives while the distribution for Mexicans' incomes is somewhat closer to that of Florida natives.

In fact, this tendency in the data can be seen to operate more generally in the cross-national measures described earlier. Because the LCD measure has much fewer indicators than the other measures, and because these indicators are primarily economic, immigrants in OECD countries who were born in other OECD countries tend to appear poorly integrated because they tend to hold a disproportionate number of higher-paying, higher-socioeconomic

US State	Birth Country	Integration Score
Arizona	Mexico	16.30
	Canada	42.58
Colorado	Mexico	3.79
	Canada	48.16
Connecticut	Mexico	22.94
	Canada	54.69
Florida	Mexico	23.75
	Canada	19.70
Georgia	Mexico	18.94
	Canada	35.89
Indiana	Mexico	14.30
	Canada	58.47
Louisiana	Mexico	30.94
	Canada	67.51
Michigan	Mexico	15.36
	Canada	54.96
Minnesota	Mexico	10.17
	Canada	92.95
Missouri	Mexico	33.71
	Canada	48.90
North Carolina	Mexico	15.50
	Canada	88.94
Nevada	Mexico	12.66
	Canada	60.17
Ohio	Mexico	11.24
	Canada	51.62
Oregon	Mexico	15.43
	Canada	52.01
Pennsylvania	Mexico	25.37
	Canada	50.03
South Carolina	Mexico	11.03
	Canada	64.78
Tennessee	Mexico	24.86
	Canada	87.32
Texas	Mexico	24.29
	Canada	66.14
Virginia	Mexico	12.06
	Canada	54.78
Washington	Mexico	3.77
	Canada	72.66

Table 3.3: Selected Integration Scores by US State (US Measure)

Model Type	Model SSE
OLS	1097.67
Probit	1062.35
Logit	1055.56
Neural Network (ANN)	1018.43

Note: Dependent variable is coded 1 if the respondent is foreign-born, 0 if native-born. Models are listed in descending order of prediction error. $N = 11,200$ individuals across 28 US states.

Table 3.4: Comparison of Modeling Techniques

status jobs in their new host societies.¹⁰ Indeed, Jacob Vigdor has noticed this same phenomenon in his data (Vigdor 2008).

So in spite of its promise and its intuitive nature, the measurement has some limitations. Another such limitation is that since it is based on census data, it does not consider *illegal* immigrants. Since their level of integration will probably be significantly lower than that of their compatriots with legal status, the integration scores are likely biased upward for groups having a large proportion of illegals.

3.7 JUSTIFYING THE ANN APPROACH

So after all this, how can we justify using an ANN in this situation? Is it really necessary to use such a complex technique?

There are several answers to this question. First and foremost, the fact that nonlinearities exist and are impactful with regard to the predictive power of the model is evident in the four hidden-layer neurons in the final parameterization. This is a pragmatic response.

¹⁰I am continuing to work on a way to incorporate the difference between positive and negative skew eventually, thus increasing the ‘fidelity’ of the measurement; still, the fact that groups whose members tend to be disproportionately upperclass are less well-integrated *does* fit well with the conceptualization of integration advanced earlier.

In order to quantify the degree to which this is true, however, it would be best to compare the prediction error of various standard modeling techniques. Table 3.4 lists the sum of squared errors for each of four model types, calculated with an identical slate of predictors on identical samples. Unsurprisingly given the binary nature of the dependent variable, ordinary least squares (OLS) performs the most poorly with an SSE of 1098. Probit and logit perform similarly, with logit outperforming probit by a slim 7-point margin. Interestingly, though, the neural network performs best, and by a margin that is roughly equivalent to the distance between the performance of the OLS and the mean of the logit and probit model SSEs. In other words, the difference in performance between the ANN and the logit/probit approaches is nearly equivalent to the difference between the OLS and the logit/probit models. This is shown to be the case not in some abstract sense, but in very concrete terms using the same data we use to create our measurement.

But there is a larger philosophical argument to be made here, as well. The conventional wisdom is that one should only complicate when necessary, that the simplest possible technique ought to be used in any given situation. I would suggest turning this argument on its head in this case and asking why we ought to make restrictive assumptions when we need not do so. Back in the days of punch-card computing, it was necessary to restrict our analyses with assumptions; even OLS regression was considered to be an exotic technique (at least when used on large datasets). In the current age of desktop (and increasingly, laptop) computing, we are less constrained by the limitations of our hardware. ENIAC was completed in 1945, but the statistical theory for OLS regression originated in 1805—a lag time of nearly a century and a half. Now, the development of hardware and software has accelerated to the point that more barriers are dropping (or at least lowering) every few months. On a one-year-old laptop it takes approximately 12 hours of computing time to run 300 neural networks on a dataset with 27000 cases; on a six-month-old desktop that time is reduced by nearly 3 hours. So in an age in which the computing power catches up so much more quickly with the statistical theory, why continue to impose such limiting assumptions?

Finally, there is an argument regarding innovation and interdisciplinarity. The recent push for interdisciplinary work in the academy has as its goal the cross-fertilization of various fields and thus an enhanced potential for innovation, something which I believe this work exemplifies. While it is undeniably true that the use of ANNs is complex and somewhat difficult to execute, that is only due to the fact that few “point-and-click” software packages exist for their implementation. As with other techniques (e.g., factor analysis), neural networks will become more widely used and understood once prepackaged subroutines are developed for major software packages like Stata, SPSS, and R. In fact, the latest version of SPSS includes an implementation of the multilayer perceptron network (its capabilities are rather limited, but it is there).

3.8 CONCLUSIONS

This chapter has conceptualized the phenomenon of immigrant integration, specified a measurement strategy based on this conceptualization, and taken some first steps toward evaluating the utility of the measure thus constructed. It has also argued overall for greater consideration of complexity in political analysis.

We have consistently argued that this is a very fertile research area. Now that a quantitative measure exists, there are many debates in the literature to which contributions may be made. We begin our sojourn into this realm in the following chapter, as we explore what can be done with a cross-national version of our measurement.

CHAPTER 4

A CROSS-NATIONAL ANALYSIS

We have described controversies in the literature and the theory that we contribute, made the case for a certain conception of immigrant integration, and have devised a measurement strategy to operationalize our concept. We now proceed to employ our measure in empirical analyses, beginning, of course, with a description of the data to be analyzed.

4.1 DATA

4.1.1 MULTICULTURALISM

Data on multiculturalism are from Banting et al. (2006); the authors surveyed the policies of some twenty-one countries over the twenty-year period from 1980 to 2000 and created scores based on whether or not (and the degree to which) the following multiculturalist policy types were enacted during that period:

1. Constitutional, legislative, or parliamentary affirmation of multiculturalism, at the central and/or regional and municipal levels;
2. the adoption of multiculturalism in the school curriculum;
3. the inclusion of ethnic representation/sensitivity in the mandate of public media or media licensing;
4. exemptions from dress codes, Sunday closing legislation, etc. (either by statute or by court cases);
5. allowing dual citizenship;

6. the funding of ethnic group organizations to support cultural activities;
7. the funding of bilingual education or mother-tongue instruction;
8. affirmative action for disadvantaged immigrant groups.

Each country received a score of 1.0 if it had explicitly adopted and implemented the policy for much of the period, 0.5 if it did so in an incomplete or token manner, and 0 if it did not have the policy (Banting et al. 2006).

4.1.2 THE WELFARE STATE

Data describing the welfare state are taken from two sources. The first is Scruggs's (2004) dataset, which revisits and updates Esping-Andersen's (1990) decommodification scores. As Scruggs recommends his benefits generosity scores for use in comparative analyses, we have opted to use these.¹ Primarily due to concerns about missing data, we have also gathered the OECD data for social expenditures as a percentage of GDP. All of these data are from the year 2000.

4.1.3 SOCIAL TRUST

Data on trust will be derived from the fourth wave of the World Values Survey (WVS), aggregated by country from individual responses using the survey design weights. The question that taps the trust concept is identical to the one that Putnam and Uslaner have used in their investigations and is as follows: "Generally speaking, would you say that most people can be trusted or that you need to be very careful in dealing with people?" Responses have been recoded 1 for "Most people can be trusted" and 0 for "You can't be too careful in dealing with people" so that when aggregated as a mean and multiplied by 100, the result is the percentage of trusters in a given society.

¹His updated 'decommodification' scores are correlated with the benefits generosity scores with a Pearson's R of 0.97, so there should be little risk of controversy in doing this.

4.1.4 IMMIGRANT INTEGRATION

As described in the previous chapter, data for integration have been generated for this project using a neural network run on cross-nationally harmonized census data from the Integrated Public Use Microdata Series (IPUMS) International project at the University of Minnesota (Center 2009). As these are new data, it may be worth taking a moment to briefly recap and summarize their creation.

The data have been generated in a manner broadly similar to that undertaken in May 2008 by Jacob Vigdor for the U.S. case (Vigdor 2008). A model was constructed using the most widely available data possible (census data in this case) in order to predict whether the respondent is a native- or foreign-born resident of the country in question. The less able the model is to distinguish between the native- and the foreign-born, the more integrated are the latter, and scores have been generated to reflect this. The differences between the approach used herein and Vigdor's, though, are twofold. First, the measure used here has been calculated across several countries for comparative purposes. Second, this was done using an artificial neural network (ANN), whereas he used a probit model. These differences are key; the first allows the score used herein to assess the impact of country-level institutional variables on integration, and the second, to achieve the best possible prediction while avoiding any a priori assumptions regarding the model specification or the nature of the data-generating processes of key variables in the population. Not making these assumptions comes at the cost of losing the interpretability of the coefficients in the model, but we are prepared to argue that enhanced predictive capability and fewer assumptions are more important than that in this case (the goal here is to create a measure, after all, not to test a theory).

Moreover, it should be pointed out that although Vigdor may have been able to make the assumption that his model contained all variables relevant to integration such that any residual variation in the dependent variable was simply random noise, we can be utterly certain that this assumption is violated in the models used for our measure because germane

predictors had to be dropped in order to preserve comparability across national subsamples and to avoid losing cases. In fact, the loss of countries has proven to be such a valid concern that two measures were actually constructed, each with a different slate of predictors. The first measure is the Least Common Denominator (LCD) measure, and was created with an eye toward maximizing the number of country samples available for comparison; it contains primarily economic predictors. The second contains a more extensive list of predictors, including some more culturally-relevant ones; it is called the Household-Dependent (HHD) measure because its additional variables required that the census data be organized by household, which further limited the available cases. Using the Banting et al. (2006) data on multiculturalism to define the universe of possible country samples, then overlaying this onto the IPUMS international datasets that are available for years near 2000 yielded nine countries for the LCD measure and five for the HHD. The predictors used in each are described in Table 4.1.

The scores consist of predicted probabilities that the individual in question is foreign-born, scaled such that a perfect inability to distinguish between native- and foreign-born (i.e., a predicted probability of 0.5) yields a score of 100, indicating high integration, while a perfect ability to distinguish yields a score of 0, indicating a low level of integration. In addition, the scores may be aggregated to different groups and to different levels of analysis. The group can be defined in any way the researcher sees fit, so long as the definition is supported by the census data from which the measure is created (e.g., Japanese, all Asians, or perhaps even all immigrants of color versus all white immigrants). It is thus equally adept at comparing, say, across groups within a country (e.g., all Latin American immigrants in the US to all Asian immigrants in the US), across cities within a country (e.g., Japanese in Los Angeles to Japanese in New York), and across countries (e.g., people from Muslim countries in the US to people from Muslim countries in the UK). For the purposes of this

Measure of Integration	Least Common Denominator (LCD)	Household-Dependent (HHD)
Predictors	Age (Limited to 25 to 65)	All those of the LCD measure, plus:
	Marital Status (4 category)	Number of Persons in Household
	Employment Status (3 category)	Number of Unrelated Persons in Household
	Occupation, ISCO (10 category)	Ownership of Dwelling (2 category)
	Industry, General Recode (15 category)	Number of Rooms in Dwelling
	Class of Worker, General Recode (4 category)	Number of Families in Household
		Number of Married Couples in Household
		Number of Mothers in Household
		Number of Fathers in Household
		Number of Own Children in Household
		Citizenship Status, Head of Household (2 category)
		Citizenship Status, Father (2 category)
		Citizenship Status, Mother (2 category)
		Citizenship Status, Spouse (2 category)
N (before sampling)	24,239,184 individuals in 9 countries	9,463,988 individuals in 5 countries

Table 4.1: Predictors Used in Constructing Integration Measures

paper, the data are aggregated by the birth country of the foreign-born respondents. The resulting group-level scores are then averaged to create the country-level aggregated scores.²

Table 4.2 presents the aggregate-level data to be employed in our investigations, and it highlights some issues with which we must now deal. First, one may notice that the HHD integration measure is uniformly lower (much lower, in most cases) and varies more than does its LCD counterpart. This is because the HHD neural net is able to discern native-from foreign-born better than the LCD one, and is to be expected given the number of additional predictors available to the former. But it points up a key feature of these scores: they are specific to the sample on which they are generated and are not comparable with one-another. That is, a country, group, or even individual score from the HHD measure may not be compared with one from the LCD measure and vice-versa.

Second, it points up a problem with missing data. While the Banting et al. (2006) data for multiculturalism are available for all the observations, the Scruggs (2004) data are not, and this problem is especially acute for the countries for which the HHD measure was generated. In fact, the Scruggs scores are missing for three of those five cases, rendering their use utterly impossible for any analyses that might use the HHD measure (which is clearly the more useful of the two integration measures, both in terms of the predictive utility of its model and the variability of the resulting score); social expenditures as a percentage of GDP will need to be used in their stead.

Third, it shows that the LCD measure, with its nine cases, comprises a much more representative sample of the other variables than does the HHD measure. In terms of the Banting et al. multiculturalism measure, the sample for the LCD data includes one ‘strong,’ three ‘modest,’ and five ‘weak’ exemplars of multiculturalism, whereas the HHD data sample

²The only exceptions to this are France and the Netherlands in the LCD measure. Their census data lack any sort of usable classification for the birth country of their respondents, so the country-level means were calculated by averaging across all of the foreign-born individual scores. It should be noted that this may introduce distortions to the measures for these countries, as groups (however these might be defined) that have more individual members will necessarily wash out the effects of those with fewer members when the mean is calculated.

Country	Immigrant MCPs (Banting et al.)	Generosity (Scruggs)	Social Expen- ditures as % of GDP (OECD)	Social Trust (WVS)	Integration (LCD)	Integration (HHD)
Australia	7	18.4	17.87	39.89	–	–
Austria	0.5	28.93	25.33	33.87	92.21	65.24
Belgium	3.5	32.61	25.3	30.68	–	–
Canada	7.5	25.45	16.73	38.85	98.9	–
Denmark	0	35.44	25.75	66.53	–	–
Finland	1	30.72	21.32	58	–	–
France	2	27.96	27.55	22.24	95.23	–
Germany	0.5	27.51	26.25	34.77	–	–
Greece	0.5	–	21.3	23.73	88.05	69.39
Ireland	1.5	26.93	13.64	35.81	–	–
Italy	1.5	26.73	23.16	32.63	–	–
Japan	0	20.39	16.11	43.06	–	–
Netherlands	4.5	35.77	19.33	59.81	93.07	–
New Zealand	5	23.7	19.11	49.05	–	–
Norway	0	41.56	22.24	65.3	–	–
Portugal	0	–	20.18	10.05	94.95	72.92
Spain	1	–	20.35	36.23	89.29	54.7
Sweden	3	36.16	28.76	66.31	–	–
Switzerland	1	19.58	18.04	40.97	–	–
Great Britain	5	21.37	19.14	29.75	99.01	–
United States	3	18.78	14.59	35.84	98.25	67.79

Table 4.2: Country-Level Data

is composed of four ‘weak’ cases and only one ‘modest’ one. This will qualify our results later on.

A final issue (albeit unrelated to the table) is that the HHD measure is the one that is best-suited for the multilevel analysis later on. This is so for two reasons. First, using the LCD measure would mean that France and the Netherlands would have to be dropped from the multilevel analysis, as they do not include a usable variable for the birth country for their foreign-born (see the earlier footnote, above), and this would reduce the total number of observations at level two to seven. Second, the codings for the birth country of the foreign-born are much more limited in the samples from the UK and, to a lesser extent, from Canada, which means fewer cases at level one, as well, if we attempt to use the LCD measure for the multilevel model. This leaves the HHD measure as the best choice for the more technical analysis later on, despite the fact that it represents only five countries.

All of these issues affect how the analyses performed herein must be structured in order to most efficiently harness the information in the variables that are available. Strategically, the best plan of action is as follows: First, we will proceed with scatter plots and bivariate correlations because these ‘low-fidelity’ techniques are well-suited to the small number of cases that are available. Then we will perform a multivariate OLS regression, from which we will derive priors for the final analysis, a Bayesian multilevel model that will allow for a somewhat more nuanced investigation of the phenomena of interest. Because we will be using the social expenditures data and the HHD integration measure for the Bayesian analysis, we will forego their use in the earlier analyses because we do not want to influence our prior expectations for them later on (deriving the priors from the same data that one plans to use to test them is not advisable).

4.2 SCATTER PLOTS AND CORRELATIONS

Figure 4.1 shows the scatter plot of the LCD integration score versus the Banting et al. Immigrant MCPs data. The Pearson’s R between the two is 0.69, statistically significant at

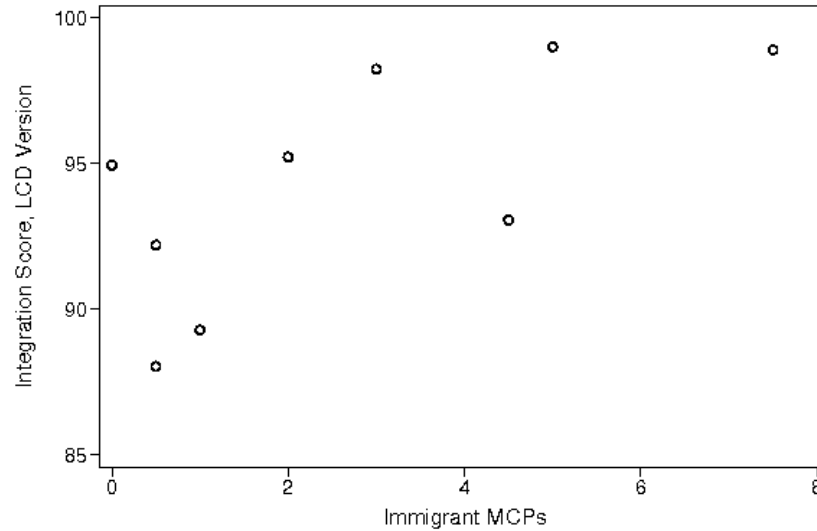


Figure 4.1: Integration and Multiculturalism

$p = 0.042$; so on the face of it, there does appear to be a positive association between the two. That's Canada up there in the far right corner with an Immigrant MCP score of 7.5 and a mean integration score of 98.9, but it doesn't drive the results alone; excluding it does reduce the statistical significance of the correlation to the .10 level, but the strength reduces only a bit, to 0.60.

Figure 4.2 shows the relationship between integration and the welfare state. The correlation here is a very strong 0.80, statistically significant at the .10 level ($p = 0.054$), indicating that more generous welfare benefits lead to depressed mean rates of immigrant integration. Removing the Netherlands (on the far right, with its generosity score of over 35) only drops the coefficient to 0.76.

The above seem indicative of fairly strong observed relationships, but social trust does not fare as well. Figure 4.3 shows the integration score plotted against the percentage of trusters, and there seems to be little connection. Pearson's R , in fact, is a paltry 0.01, with $p = 0.977$; hardly a resounding endorsement.

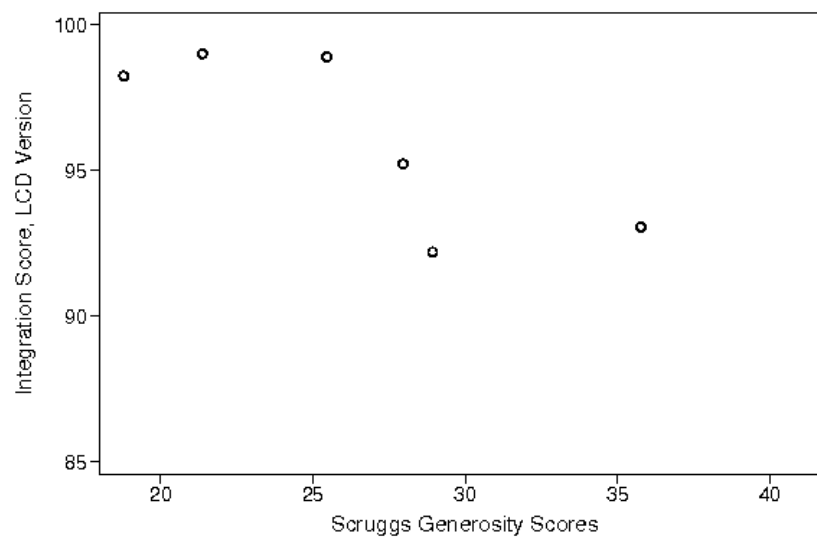


Figure 4.2: Integration and the Welfare State

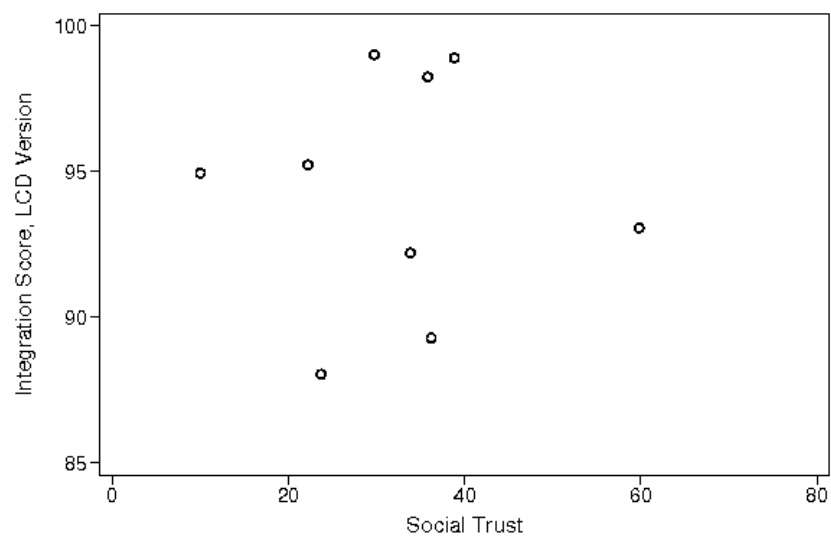


Figure 4.3: Integration and Trust

Of course, all of the above are simple bivariate analyses and do not allow for the parsing out of separate effects; in an attempt to do this, we turn to a Bayesian multilevel model.

4.3 A BAYESIAN MULTILEVEL MODEL

There are several reasons to run a Bayesian multilevel model at this point. First, the data are structured with birth country groups nested within countries, so a multilevel model will allow us to use all of the available information without confounding the unit of analysis. Second, a multilevel model allows us to insert predictors at level one (the birth country group level) that may control for variation in the integration measure such that the estimates at level two (the country level) are sharpened, since the latter is where our theoretical interests lie. Third, it allows us to model “cross-level interactions” to test more nuanced hypotheses that we simply cannot test in a standard model using only aggregated data.³ Fourth, Bayesian models allow us to specify our prior beliefs with regard to the strength and uncertainty of the coefficients, thus allowing the inclusion of external information in order to more accurately specify the model. In this case, we will derive informative priors for multiculturalism and benefits generosity from multivariate OLS estimates obtained separately (not reported).⁴

4.3.1 PRIOR DISTRIBUTIONS

Defining the priors requires defining a distribution consisting of a mean, which describes the point estimate for the coefficient, and a variance that describes one’s uncertainty about that point estimate. The difficulty in this case is that the dependent variables are not on the same scale (the LCD measure from earlier differs substantially from the HHD measure to be used in this analysis), so the coefficients from the OLS regression that describe the per-unit change do not translate directly—they must be rescaled according to some criterion. In

³These are all points to which we will return in a moment when we examine the model itself.

⁴The results from this model were not reported because the paucity of data made it difficult to justify any inferences; moreover, they essentially replicated the results of the scatter plot analysis above and were thus deemed redundant.

addition, the Scruggs generosity data must be replaced with the OECD social expenditures data because the former is unavailable for three of our five cases, so defining the prior for the coefficient on the welfare state is made even more difficult because we lack a common point of reference. Happily, though, a solution for this conundrum may be found in Table 4.2 from earlier (more on that in a moment).

A coefficient depicts the amount of influence one variable has on another, and in order to translate this across variables with different scales, we may convert it to the proportion of the variation (the observed range) in the dependent variable that is influenced per unit change in the independent variables. We begin by calculating the range of the LCD integration measure; we then divide each coefficient by this range to determine the per-unit-change proportion effect.⁵ Once we have this proportion, we simply multiply the range of the dependent variable from the Bayesian model (the HHD integration measure) by it to yield a ‘best-guess’ prior point estimate for the coefficient. This simple process works for the Banting et al. multiculturalism scores, for example, because the units are the same across the models (we’re using the same measure with the same units in both the OLS and the Bayesian multilevel models). For our measure of the welfare state, however, things are more complex because (as mentioned earlier) the units for Scruggs’ benefits generosity are not the same as the units for social expenditures as a percentage of GDP, so we lack the common reference point we used in the calculation for the coefficient on multiculturalism. Luckily, there are two countries from the OLS model that will be included in the multilevel model (Austria and the US), so we have data on both benefits generosity and social expenditures for these two cases. We can thus use the distances between them on both measures as the reference points that we need. We do this by calculating the predicted percent change in the LCD measure of integration over the distance between Austria and the US on benefits generosity (for the OLS model), then translate this to the multilevel model by calculating

⁵In order to be as conservative as possible in evaluating this, we calculate the range of the dependent variable (the LCD integration measure) using all nine of the available cases rather than just those six that were used in the OLS model. This gives us a greater range of variation and biases the ‘percent change’ downward, making the calculated effects smaller.

the per-unit percent change in the HHD measure of integration that would be required for the social expenditures measure to have the same amount of influence over its range between Austria and the US. This may seem complicated at first glance, but all we've done is taken the additional step of defining a common scale for the units of the two different welfare state measures by reference to particular cases for which we have data for both.

We have now derived the priors for our 'best guesses' for the coefficients (the means for the prior distributions), but we must also specify the certainty with which we hold those convictions (the variances for the prior distributions). These are much simpler to determine; they have been engineered such that the 95% credible interval borders on, but does not quite include zero. This should maximize the potential for the data to influence the posterior distributions for these coefficients while still maintaining the integrity and value of the information added by the prior.

So why have we not created a prior for social trust? We derive informative priors only for the variables for which we may specify them with some reasonable amount of certainty; in this case, we include multiculturalism and the welfare state. We do not derive an informative prior for social trust because there is too much uncertainty about its effect (if indeed it has one at all); because of this, we insert a noninformative (or diffuse) prior for the coefficient on trust into the Bayesian model. See Table 4.3 for a summary of the priors used.

4.3.2 THE MODEL

As noted earlier, the data employed in this analysis have a nested structure, with immigrant groups nested within countries. This means that there are effectively two levels to the data. If one could visualize a dataset with this type of structure, one would see the level two (country-level) variables as identically repeated observations over many different level one (immigrant group-level) cases. In the case of the current analysis, one would see many groups with the same value on trust, for this varies only by country, not by immigrant group.

Variable	Prior	Substantive Interpretation
Immigrant Multiculturalist Policies	1.17 (0.597)	Adopting one additional MCP over the period from 1980 to 2000 will increase the mean immigrant integration score for the country by 1.17 (an effect size derived from the earlier OLS estimates). The effect may be as strong as 2.34 or as weak as zero, but it is almost certainly not negative.
Welfare State Extensiveness	−0.587 (0.299)	An increase of one percentage point in a country's social expenditures as a percentage of GDP translates to a decrease in its mean immigrant integration score of 0.587 (an effect size derived from the earlier OLS estimates). The effect may be as strong as -1.17 or as weak as zero, but it is almost certainly not positive.
Social Trust	0 (10^6)	Noninformative (diffuse) prior; defines no prior expectations.

Table 4.3: Prior Means (Standard Deviations) and Their Substantive Interpretations for Bayesian Multilevel Analysis of Immigrant Integration

Such a data structure poses problems for conventional analytic methods.⁶ Primary among these is the violation of the assumption of observational independence. If the values of the level-two variables are identical within countries, the observations at level one are no longer independent. Moreover, the values on any level-one variables may not be wholly independent, especially when certain factors (here primarily geographic and cultural) govern the distribution of the level-one units (the immigrant groups) among the level-two groups (the countries). The result is that the level-one units are not randomly assigned to the level-two groups—and this means that the level-one observations are no longer entirely independent. If ordinary methods are employed to analyze such data, the violation of this assumption will

⁶Much of the explanation of multilevel model mechanics in this section is adapted and summarized from Osborne (2000) and Raudenbush & Bryk (2001).

result in standard errors that are incorrect. Even employing robust standard errors does not suffice, in most cases, to satisfactorily address this problem.

A second problem is encountered when one's theoretical interest is in specifying cross-level interactions (interaction effects between variables at different levels of analysis). In the current analysis, for example, one of the interests is the effect of social trust on an immigrant group's integration score. Since this would involve estimating the effect of a level-two variable on a level-one variable, it would confound the unit of analysis. Moreover, conventional attempts to address this problem through data manipulation fail; aggregating the level-one data prior to estimating the effects invokes the ecological fallacy and discards much useful variation, and assigning level-two characteristics to level-one cases results in the same violations of the independence assumption already outlined above.

The solution to both of these problems may be found in multilevel modeling. Essentially, this technique performs a procedure that is analogous to running a separate analysis within each level-two group in the dataset, then taking the means of each of the resulting estimates (intercepts and slopes in a regression) across the groups. Variance statistics are also reported for each of these means, allowing the researcher to determine to what extent the estimates vary across the groups and whether or not (or how much) the level-two variables account for that variation through any specified cross-level interactions.

Figures 4.4 and 4.5 depict the model used for the analysis.⁷ There are several points to note about the model. First, each of the level one estimates is itself the outcome variable in an equation specified at level two. This allows us to model the aforementioned cross-level interactions by specifying level two predictors in each of these functions. In the above example, the constant of the level one equation (β_0) is predicted by the country-level variables "ImmMCPs," "Trust," and "SocExpnd." What this means conceptually is that the variance in the mean integration score at the immigrant group-level is hypothesized to differ, on average, depending on differing levels of these variables.

⁷A quick technical detail: the dependent variable is distributed truncated normal on the interval (0, 100); imposing this constraint was necessary to avoid out-of-range predictions.

The second item of interest is the intercept of each level two equation (γ_{x0} , where x corresponds with the subscript of the level one coefficient modeled). These reflect the fact that in a multilevel model, the within-group level one estimates are not directly represented in the output. Recall from earlier that these models calculate the mean value of the level one estimates, averaged from the results of all of the within-group analyses. The intercept of the level two equation represents this quantity. This makes good conceptual sense, once one considers that the intercept at level two is, on average, the value taken by the level one coefficient when all of the level two predictors equal zero.

Also, we've now added a predictor at level one for group-level integration scores. This is a dummy variable coded one for those individuals whose country of birth is classified as "low income" or "lower middle income" by the International Bank for Reconstruction and Development (the World Bank).⁸ It is used here in two capacities. First, it controls for much of the variation in the integration score, and this reduces its volatility in the model and sharpens the estimates of the coefficients at level two (the country level), which is where our primary theoretical interests lie. Second, it provides an opportunity to test some finer-grained hypotheses regarding the level two variables by modeling them on its coefficient (note that β_1 is predicted by immigrant multiculturalist policies (MCPs), social trust, and social expenditures as a percentage of GDP in Figure 4.5). By setting up the model in this way, we test three additional notions. First, the coefficient on social expenditures tests Koopmans' relative deprivation thesis regarding why the welfare state might depress integration scores. If he is correct that immigrants from low income countries tend to perceive the living conditions under the welfare state as satisfactory relative to their previous conditions, then we should see the relationship between the low income dummy and integration become more strongly negative as social expenditures increase.

⁸A more specific five-category coding scheme (high income non-OECD, high income OECD, upper middle income, lower middle income, low income) was tried in an earlier model (not shown); it was found that the differences in the effects of the more specific classifications were not statistically different from zero and so the categories were collapsed into two groups: low income and high income, with the split occurring between the upper middle and lower middle income groups.

$$\text{Integration} = \beta_0 + \beta_1(\text{LowIncome})$$

Figure 4.4: Level One Equation (Group-Level Data).

$$\begin{aligned}\beta_0 &= \gamma_{00} + \gamma_{01}(\text{ImmMCPs}) + \gamma_{02}(\text{Trust}) + \gamma_{03}(\text{SocExpnd}) + u_0 \\ \beta_1 &= \gamma_{10} + \gamma_{11}(\text{ImmMCPs}) + \gamma_{12}(\text{Trust}) + \gamma_{13}(\text{SocExpnd}) + u_1\end{aligned}$$

Figure 4.5: Level Two Equations (Country-Level Data).

We also test the idea that immigrant MCPs might affect those from low-income countries more intensely than those from higher-income locales. The dummy variable is a blunt instrument and may be considered to proxy for cultural differences vis-a-vis Western society as well as the level of economic development (see the work of Ron Inglehart on this point (e.g., Inglehart 1997)). The idea here is that those from low income countries are likely, on average, to have greater cultural differences vis-a-vis the West and that as such it is they who would be most strongly impacted by multiculturalist policies. Based on the fact that earlier analysis at the aggregate level showed the effect of multiculturalism to be positive on integration, we hypothesize that this effect should be even more pronounced for those whose cultural differences are greater; the coefficient on the low income dummy variable should be positively affected as immigrant multiculturalist policies increase.

Finally, including trust in the level two equation for β_1 tests the notion that, again due to their greater differences along a host of dimensions, those from low-income countries may be even more positively affected by the trusting context of their new host societies than others. If this be the case, then the coefficient on trust, γ_{12} , should be positive.

	Coefficient (Std Error)		
	[Model 1]	[Model 2]	[Model 3]
Group-level Predictors			
<i>Modeled on Integration, β_0</i>			
Low Income, β_1	-14.65** (5.59)	-15.03** (5.741)	-15.03** (5.741)
Country-level Predictors			
<i>Modeled on Integration, β_0</i>			
Immigrant Multiculturalist Policies, γ_{01}	1.307** (0.6578)	1.307** (0.6578)	1.307** (0.6578)
Social Trust, γ_{02}	2.452** (0.9591)	2.456** (0.9591)	2.456** (0.9591)
Social Expenditures as % of GDP, γ_{03}	-0.5097 (0.2606)	-0.5097 (0.2606)	-0.5097 (0.2606)
<i>Modeled on Low Income, β_1</i>			
Immigrant Multiculturalist Policies, γ_{11}	-6.029 (28.52)	— —	— —
Social Trust, γ_{12}	— —	-0.4491 (0.9542)	— —
Social Expenditures as % of GDP, γ_{13}	— —	— —	-0.6 (1.275)

Note: Dependent variable is HHD measure. $N = 95$ groups in 5 countries. ** 95% credible interval does not contain zero. Results reported for nine thousand iterations after a two thousand iteration burn-in period. Multiple models are presented due to degrees of freedom limitations.

Table 4.4: Cross-National Bayesian Multilevel Analysis of Immigrant Integration

4.3.3 RESULTS

The results, shown in Table 4.4, are interesting. Multiculturalism takes on an even stronger effect than we gave it in the prior and becomes more strongly credible. Social expenditures, on the other hand, gets a weaker negative estimate and just misses statistical significance as its right error bound reaches a very weakly positive 0.002655. These differences may have to do with any combination of up to four factors: First, the model is different in its structure and allows for better estimates of the coefficients than before. Second, as pointed out earlier, the sample of cases includes primarily countries that are at the lower end of the spectrum in terms of their multiculturalist policies. This might especially explain the strengthening of the coefficient on multiculturalism, as it may well be that there is a mild nonlinearity here—perhaps the addition of a multicultural policy when a country has few in place carries more weight vis-a-vis immigrant integration than adding the same policy when one already has several on the books (sort of a ‘diminishing marginal returns’ idea). Third, the measurement of the welfare state used in this model is a blunter instrument than that used in earlier analyses. We cannot calculate the Pearson’s R between the two measures for the five cases in this sample because we have only two shared data points (that is, there are only two countries that have scores for both the Scruggs and the OECD measures), but the overall correlation between the two is a mere 0.55 across 20 countries, significant at $p = 0.011$. So they clearly are not measuring precisely the same thing, and this may explain the observed shift from prior to posterior, at least in part. Fourth, the dependent variable, by virtue of the improved predictive utility of the model used to generate it, varies more than the previous measure. This may also contribute to the observed differences.

The surprise performer here, however, is social trust, as it takes a positive and credible coefficient (see Figure 4.6; note that the green, red, and blue bars represent the 90, 95, and 99% credible intervals respectively). It seems that controlling for the variation at level one reduced the uncertainty of the mean at level two enough to better isolate the effect of trust.

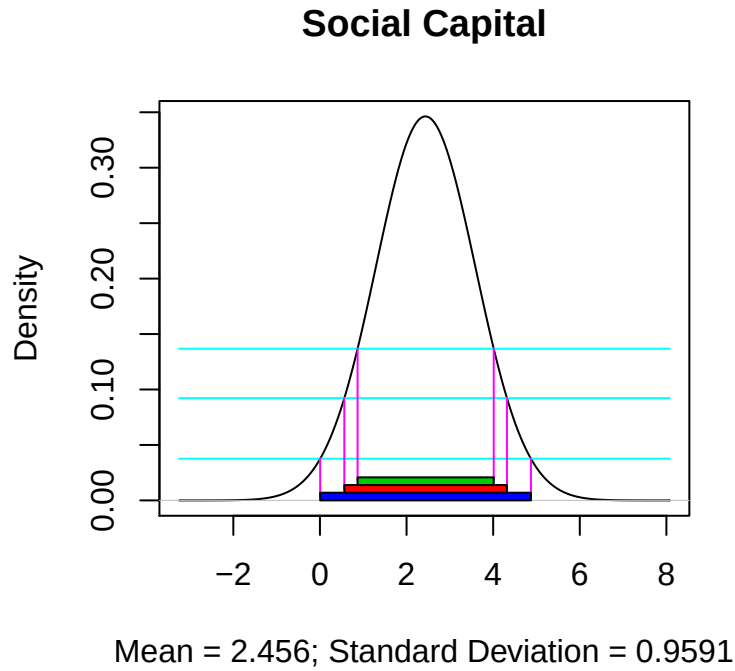


Figure 4.6: Posterior Distribution: Model 2, γ_{02}

For every percentage point increase in the proportion of trusters in a country, the mean immigrant integration score tends to increase by 2.5, or 13.7% of its total observed range.

As for the proposed interaction effects, none are credible. It is apparent that there are simply too few level-two cases to test for such effects.

4.4 CONCLUSIONS

We have endeavored to bring a novel measurement to bear on critical theoretical questions. We have found that multiculturalist policies tend to increase immigrant integration, while the welfare state tends to weakly decrease it. These are important substantive conclusions and are consistently evidenced, although they must certainly not be overemphasized due to the paucity of cases available for analysis. The Bayesian multilevel model suggests that social

trust may also play a role in increasing integration, but it must also be interpreted with great caution due to the size and qualitative attributes of its sample of countries. Due primarily to these data limitations, we were unable to shed more light on the causal mechanisms that underlie the observed aggregate relationships.

The data limitations are severe; so severe in fact that one must hesitate to make any statistical inferences. Still, the results above are provocative and suggest strategies for future research in this area. Recalculating the integration score across subunits within individual countries, for example, would allow the inclusion of many more and more specific predictors in its construction, all of which would improve the fidelity of the measure significantly. This in turn would mean having a dependent variable that exhibits greater variation, thus enhancing the potential for meaningful results.

In the next chapter, we take up these challenges as we shift our attention to the so-called “laboratories of democracy” and seek to compare across the US states.

CHAPTER 5

AN ANALYSIS ACROSS THE US STATES

In the last chapter, we focused on comparing across states in the international system but found that because so few cases were available for analysis, our conclusions were merely suggestive. In this chapter, we seek to enlarge the number of cases available to us in order to enhance the validity of our inferences.

Following King, Keohane & Verba (1994) (and others), we might choose to enlarge the pool of applicable cases by including more time points. The problem with this is that the census data are in many cases not comparable over time even within countries, not to mention across multiple countries. Moreover, there is the problem of defining germane covariates (e.g., social capital, the welfare state, and multiculturalism) that are comparable across time and/or space. In light of these issues, we focus on a single country and choose to compare across its subunits; the country for which there is the most available data is the United States. Due to its unique form of federalism in which the sub-national states share sovereignty with the national government, its constituent units have rightly been called the “laboratories” of democracy. Policies can vary quite dramatically across US states, as can the socioeconomic context. Moreover, the fact that there are 50 such units allows us to retain a larger dataset after listwise deletion due to limited data availability.

We will begin with a description of the data to be used in the analyses. Multilevel models will then be presented and their results discussed. Finally, we will focus on comparing a single immigrant group across the US states in order to gain additional insight.

5.1 DATA

5.1.1 INTEGRATION

The measurement of immigrant integration employed as the dependent variable in this chapter is the US measure detailed in chapter 2. It has been created for the ten most populous immigrant groups in each of 28 states and is based on the predictors listed in Table 3.1.

5.1.2 MULTICULTURALISM

The measurement of multiculturalism is from Hero & Preuhs (2007) and is a factor score index based on the policy indicators listed in Table 5.1.

5.1.3 THE WELFARE STATE

We are fortunate to have found a measure of the welfare state that explicitly describes immigrant access to that institution. Hero & Preuhs (2007) constructed this factor score as for use as their dependent variable using the components listed in Table 5.2. In so doing, they exploited a change in federal welfare policy in 1996 that allowed states to decide if recent immigrants would be included in welfare benefits, and to what degree. This measurement represents a significant step forward in precision from the measures employed in the previous chapter, as it taps variation in immigrant *access* to welfare benefits rather than the benefit levels themselves.

5.1.4 SOCIAL CAPITAL

In this chapter, we forego the targeted survey-based measurement of social trust in favor of a broader, more comprehensive index measure created by Robert Putnam and used in his book, *Bowling Alone* (Putnam 2000).¹ The variable is a factor score index generated using

¹The problem with operationalizing trust as a survey question in this context is that the surveys that contain this question (the General Social Surveys (GSS), the American National Election Studies (ANES), etc.) are weighted to be representative at the national level rather than the state level. Postratification methods might be applied to adjust the weights to facilitate state-to-state

Multicultural Disposition Index	
<i>Components</i>	<i>Sources</i>
Undocumented immigrants eligible for a state driver's license.	National Immigration Law Center. 2005. <i>Overview of States Drivers License Requirements</i> . March 17, 2005. http://www.nilc.org/immspbs/DLs/state_dl_rqrmts_ovrvw_031705.pdf .
Undocumented immigrants eligible for resident tuition.	Fischer, Karin. 2004. "Illegal Immigrants Rarely Use Hard-Won Tuition Break." <i>The Chronicle of Higher Education</i> , December 10, pp. A19-A21.
State funding for limited English proficiency programs.	National Clearinghouse for Bilingual Education. 1999. <i>State Survey of Legislative Requirements for Educating Limited English Proficient Students</i> . Accessed August 16, 2004 at http://www.ncela.gwu.edu/pubs/reports/state-legislation/noframe.htm .
Certification for English as a second language instructors.	Preuhs, Robert. 2005. "Descriptive Representation, Legislative Leadership, and Direct Democracy: Latino Influence on English Only Laws in the States, 1984-2002." <i>State Politics and Policy Quarterly</i> 5: 203-24.
Certification for bilingual instructors.	Preuhs, Robert. 2005. "Descriptive Representation, Legislative Leadership, and Direct Democracy: Latino Influence on English Only Laws in the States, 1984-2002." <i>State Politics and Policy Quarterly</i> 5: 203-24.
Official recognition of Cesar Chavez Day.	States with an official Cesar Chavez Day were coded from the Cesar Chavez Foundations website on May 9, 2005, at http://www.chavezfoundation.org/ .

Note: Source is Hero & Preuhs (2007, 511–512). All items coded 1 if state has policy, 0 otherwise. Variable is factor score of policy indicators presented.

Table 5.1: Measuring Multicultural Disposition in the American States

Immigrant Welfare Access Index	
<i>Components</i>	<i>Sources</i>
State-funded TANF during the five-year bar imposed by a 1990 federal law.	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. <i>State Snapshots of Public Benefits for Immigrants: Occasional Paper Number 24, Supplemental Report</i> . Washington, DC: The Urban Institute.
State allows immigrants to be eligible for TANF after federal five-year bar.	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. [Same as above.]
Immigrants eligible for state general assistance (cash payments).	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. [Same as above.]
Immigrants eligible for state-funded food stamps.	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. [Same as above.]
Substitute program for Supplemental Security Income (SSI) for immigrants.	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. [Same as above.]
Immigrants eligible to receive state medicare funds during the federal five-year bar.	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. [Same as above.]
Medicaid funding for non-emergency care for some undocumented immigrants.	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. [Same as above.]
Immigrants eligible for state health care programs.	Tumlin, Karen, Wendy Zimmerman, and Jason Ost. 1999. [Same as above.]
Immigrants eligible for state-funded prenatal care.	Pre-Natal Care for Undocumented Immigrants. Fox News Online. 2004. "Arkansas Debate Focuses on Pregnant Illegals." May 6, 2004.

Note: Source is Hero & Preuhs (2007, 511–512). All items coded 1 if state has policy, 0 otherwise. Variable is factor score of policy indicators presented.

Table 5.2: Measuring Immigrant Welfare Access in the American States

Components of Social Capital Index	Correlation with Index
<i>Measures of community organizational life</i>	
Served on committee of local organization in the last year	0.88
Served as an officer of some club or organization in the last year	0.83
Civic and social organizations per 1,000 population	0.78
Mean number of club meetings attended in the last year	0.78
Mean number of group memberships	0.74
<i>Measures of engagement in public affairs</i>	
Turnout in presidential elections, 1998 & 1992	0.84
Attended public meeting on town or school affairs in last year	0.77
<i>Measures of community volunteerism</i>	
Number of nonprofit (501[c]3) organizations per 1,000 population	0.82
Mean number of times worked on community project in last year	0.65
Mean number of times did volunteer work in last year	0.66
<i>Measures of informal sociability</i>	
Agree that "I spend a lot of time visiting friends"	0.73
Mean number of times entertained at home in last year	0.67
<i>Measures of social trust</i>	
Agree that "Most people can be trusted"	0.92
Agree that "Most people are honest"	0.84

Note: Source is Putnam (2000, 291).

Table 5.3: Measuring Social Capital in the American States

the components listed in Table 5.3. Choosing to employ this measure does not represent a significant departure from our operationalization in the previous chapter, however; note that the social trust survey question we used in the cross-national analysis is quite highly correlated with the overall index, having a Pearson's R of 0.92.

comparisons, but they require choosing demographic characteristics on which to stratify the sample (which itself entails no small amount of investigation), and at any rate the publicly available data (in the GSS case) lack geographic codes that are specific enough to allow the calculation of such weights by state. These considerations led me to choose to use an existing measure rather than generating my own.

5.1.5 CONTROL VARIABLES

The greater number of cases at our disposal in this chapter allows us to incorporate state-level control variables, a luxury that was unavailable in the cross-national analysis. The literature concerning integration in the United States points up two in particular.

Min Zhou, for example, explains how urban environments may limit the potential of immigrants to integrate. She posits that immigrants who face the limitations of a declining inner-city job market and who are seen as non-white by the dominant society risk being “incorporated into a minority-dominated underclass” (Zhou 1997). Wilson & Portes (1980) also argue that urban environs may depress integration, as they are more likely to encourage immigrants to live together in ethnic neighborhoods and to work within their “ethnic enclaves.” Waldinger (1999) agrees with this interpretation, as well, in his description of ethnic “niches.”

In order to control for these effects, we include a variable that measures urbanization. Gleaned from the 2000 US Census, this measure is the percentage of the state population that lives in an urban area.

The other germane control variable is a measure that taps the general state of the economy. Herbert Gans, in his landmark article on “second-generation decline,” questions the dominant “straight-line” theory of integration associated with Warner & Srole (1945) and makes a number of arguments regarding why economic variables ought to be brought into the discussion. In particular he notes that economic growth and market requirements for skilled versus unskilled labor are key items.

Even though we have a greater number of cases at our disposal for the analyses in this chapter, we are still limited with regard to the number of variables we can include; ideally, then, we wish to choose a single economic variable that will control for a variety of effects. Growth requires measurement over time and ours is a cross-sectional analysis, so this is not the best option for inclusion. Labor market demand (as opposed to composition) is somewhat difficult to assess, and at any rate is too specific to Gans’ proposed causal mechanisms to serve as our single indicator. We choose unemployment, both for its ability to represent

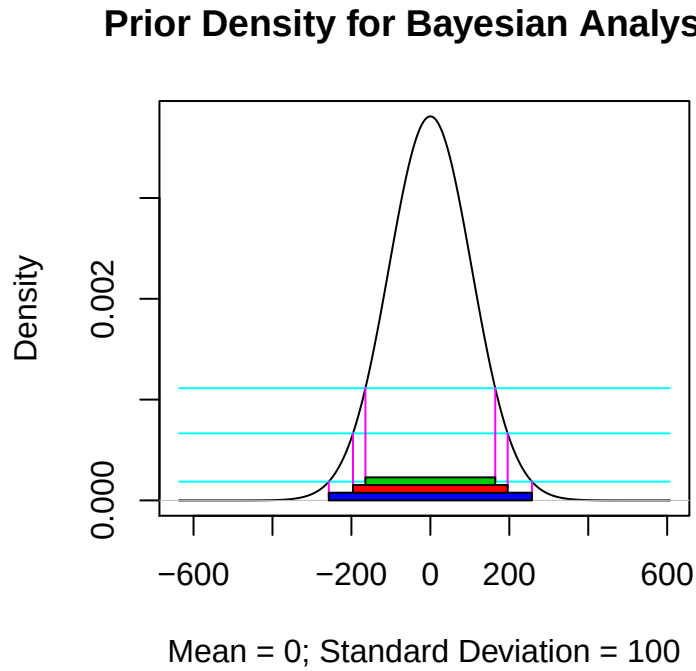


Figure 5.1: Prior Distribution for US Analyses

the general state of an economy and for its broad availability. It is operationalized as the percentage of the adult population that is unemployed in a given state, sourced from the State Politics and Policy Data Archive.²

Finally, note that every effort has been made to ensure that all the variables employed in the analyses come from as near as possible to the year 2000 (the year of the census from which the integration scores were generated).

5.2 A WORD ON PRIORS

We employ the prior distribution shown in Figure 5.1 as our diffuse (or uninformative) prior for the analyses of the US states herein. Note that the green, red, and blue bars represent

²URL: http://academic.udayton.edu/SPPQ-TPR/tpr_data_sets.html

the 90, 95, and 99% credible intervals, respectively. It should be pointed out that this prior is not nearly as diffuse as many “standard” uninformative priors used in Bayesian analyses, as its standard deviation is only one hundred as opposed to ten thousand or one million. The reason for this is quite straightforward. Taking into account that the theoretical range of our dependent variable is only from zero to one hundred and coupling this with knowledge of the units of the independent variables, it makes sense to limit the 95% credible interval for the coefficients to a range of about -200 to $+200$, a value that still assigns a reasonable probability to a coefficient that is twice the entire theoretical range of the integration score. Assigning a prior with a standard deviation of 10,000 would allow for coefficients in the range $-20,000$ to $+20,000$ and a σ of 1,000,000 would allow anything from $-2,000,000$ to $+2,000,000$. Moreover, the more diffuse the prior, the more data are required to condition it—and our dataset is limited to maximum of 28 state-level cases.

5.3 MULTILEVEL ANALYSES

First, recall that the data consist of immigrant groups nested within US states. We do not include any immigrant group-level controls in this analysis because the estimated effects would be inaccurate due to the fact that some groups exist simultaneously in multiple states (e.g., groups of Mexico-born persons exist in 25 of the 27 states in the models in this section). This helps by ensuring greater unit homogeneity for comparing across states, but it presents problems for estimating the effects of group-level variables even though it is *not* the case that the individual persons that comprise the groups exist simultaneously across states and integration scores *do* vary within group clusters across states (e.g., the group of Mexico-born persons in California has a different score than the Mexican group in Florida).³ Results for two nested models are presented in Table 5.4.

³Following Browne, Goldstein & Rasbash (2001), a “multiple-membership” model was constructed in WinBUGS to account for this; it would not converge due to a lack of sufficient degrees of freedom, so the decision was made to drop the group-level covariates.

	Posterior Mean (Std Deviation)	
	[Model 1]	[Model 2]
State-level Predictors		
<i>Modeled on Integration, β_0</i>		
Social Capital, γ_{01}	11.86* (7.101)	4.36 (8.49)
Immigrant Access to Welfare, γ_{02}	-5.686* (3.223)	0.6934 (4.986)
Multicultural Disposition, γ_{03}	26.05** (7.253)	-0.9827 (9.84)
Unemployment, γ_{11}	- -	-5.674 (6.575)
Urbanization, γ_{12}	- -	0.9684** (0.3473)

Note: Dependent variable is US measure. $N = 270$ groups in 27 US states.
 ** 95% credible interval does not contain zero. Results reported for thirty thousand iterations of two MCMC chains after a two thousand iteration burn-in period.

Table 5.4: Bayesian Multilevel Analyses of Immigrant Integration Across US States

The results from Model 1 are quite encouraging, as they mirror those from the cross-national analysis in the previous chapter. Social capital exhibits a substantively strong positive effect, and the 90% credible interval of its posterior distribution (the green bar in Figure 5.2) does not include zero. Immigrant welfare access tends to depress integration, and multicultural disposition increases it (see Figures 5.3 and 5.4, respectively). Multiculturalism has by far the strongest and most credible effect, but all fare quite well.

Model 2 brings these results into question, however, and may even lead one to reconsider the earlier cross-national analysis. Once control variables are included, the credibility of coefficients on the main independent variables vanishes entirely. Urbanization draws up the explanatory power that was previously accorded to social capital, welfare state access, and

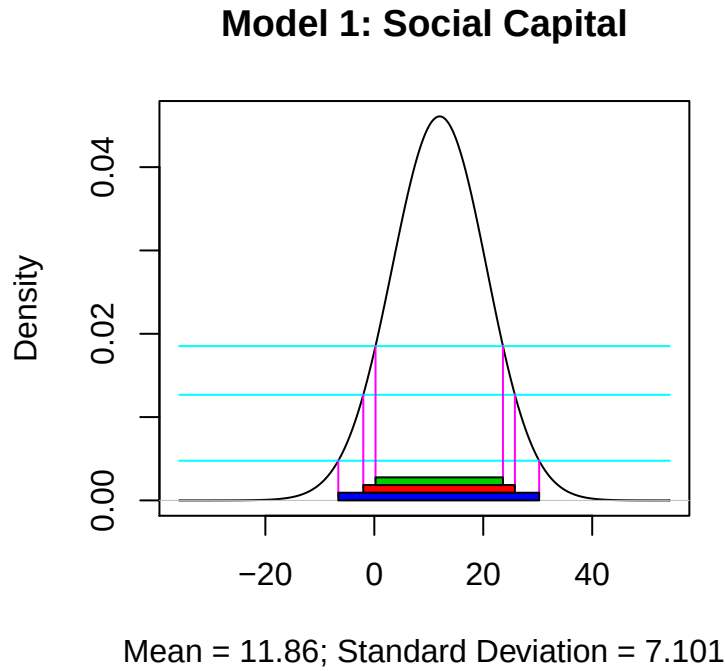
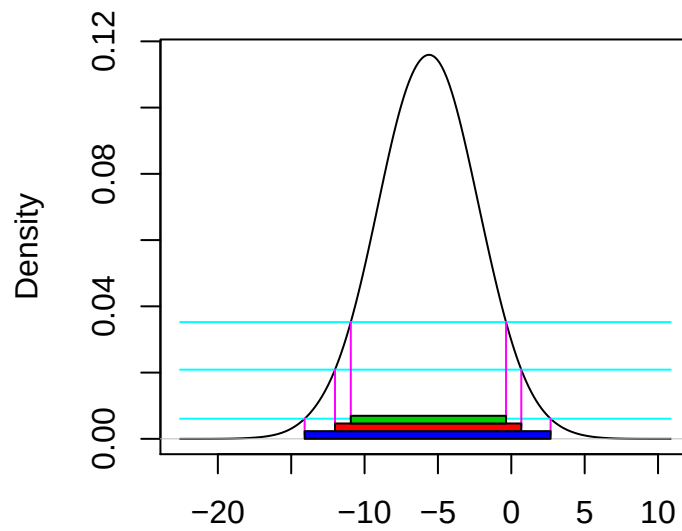


Figure 5.2: Posterior Distribution: Model 1, γ_{01}

multiculturalism—and this effect is not due to any colinearity in the model. Figure 5.5 shows the posterior density for this coefficient.

These results are calculated on average across all available state-groups. One might question the validity of such an approach for two reasons. First, as described earlier, each state has a different set of groups within it and the state-level variables are modeled on the mean of those group scores, so this difference may well be fouling the results. Second, there is good reason to suspect that different immigrant groups will be affected differently by the explanatory variables, and it may well be that positive effects might be balanced by negative ones such that the estimated coefficient is near zero. In order to explore the hypothesized relationships further, then, it would behoove us to choose a single group on which to focus in our next round of analyses.

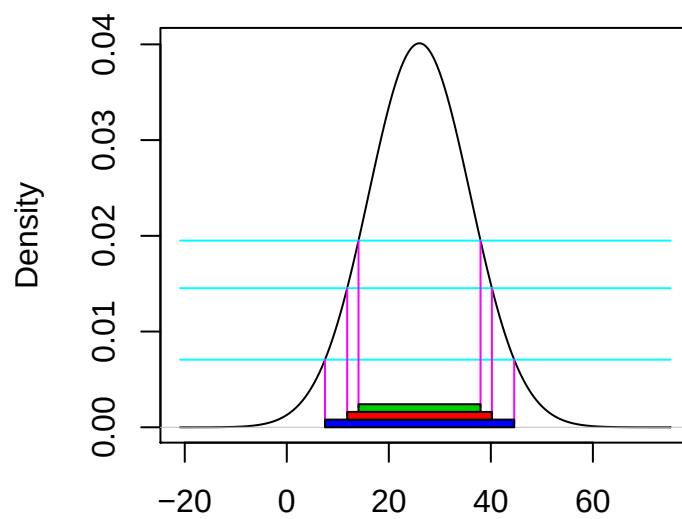
Model 1: Immigrant Welfare Access



Mean = -5.686; Standard Deviation = 3.223

Figure 5.3: Posterior Distribution: Model 1, γ_{02}

Model 1: Multicultural Disposition



Mean = 26.05; Standard Deviation = 7.253

Figure 5.4: Posterior Distribution: Model 1, γ_{03}

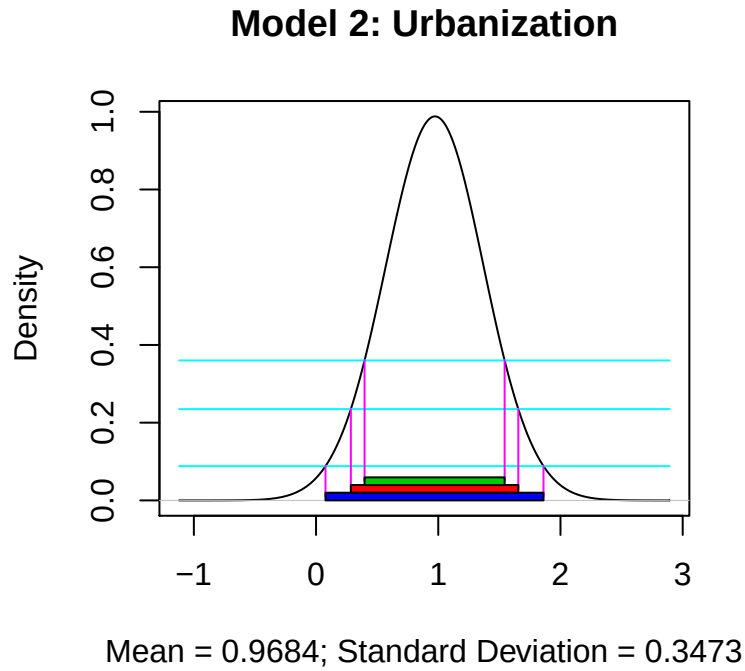


Figure 5.5: Posterior Distribution: Model 2, γ_{05}

5.4 A CLOSER LOOK AT THE MEXICO-BORN

We choose to focus on the Mexico-born for a variety of reasons. First, they are by far the most numerous immigrant group in the US, and this gives us more data points across states. This enhances the likelihood of drawing firm conclusions. Second, they are the most politically relevant immigrant group in the US, and many of the recent controversies and policy debates about immigration in the US have been centered on them. This makes any conclusions drawn all the more relevant. Third (and this is a more subtle point), unlike many other immigrant groups who come to the US from farther away (e.g., Chinese, Indians, etc.) there are fewer concerns with human trafficking for lower-class individuals and families (which may inhibit integration due to indentured servitude) and less selection bias towards upper-class persons

(e.g., the wealthy come to the States because they can afford to do so)—we know for a fact that most Mexicans who enter the US are not upper-class members of their society of origin, and in this way, the economic and cultural status of these immigrants and the geographic proximity of their country of origin to the US might rightly be said to parallel that of Eastern European countries with respect to Western European ones (for example).⁴ This enhances the generalizability of any conclusions we might draw.⁵

5.4.1 DATA EXPLORATIONS

Figure 5.6 plots social capital and integration for the 25 states for which data exist. The graphic is illuminating. Note that the Pearson's R between the two (which is equal to the regression coefficient in the bivariate case) is very weakly negative and not statistically different from zero. What is interesting, however, is that only four cases (Washington, Oregon, and Minnesota in the lower right and Louisiana in the upper left) seem to be driving the observed negative relationship entirely. Their exclusion does indeed make a dramatic difference, as illustrated by Figure 5.7 in which the relationship is a strong and statistically significant 0.62.

This is all well and good, but it is difficult to justify dropping 16% of the available cases merely for the sake of achieving harmony with our theoretical predictions. Happily, though, there are sound reasons to consider these cases to be outliers.

The states of Washington, Oregon, and Minnesota exhibit integration scores that are quite low given their levels of social capital. This seems odd at first glance, as one might think that Mexican-born persons who would venture that far from their country's border might actually be *better* integrated than others that elect to stay closer. There are good reasons

⁴Surely the *coyotes* exist and do traffick persons across the US-Mexico border, but the fact remains that all else equal, it is far easier for a Mexican to make the journey on his or her own than it is for a Chilean, a Chinese, a Sudanese, an Indian, etc.

⁵One might also wonder at this point why we include a case study on a group in the US and do not conduct one for a group in another country. The reason is that although integration scores may be generated for subnational units in other countries using the geo-codes provided in their census data, no data exist for the independent variables at that level.

for this apparent oddity, however. Each of these states has a large agricultural sector, and each relies on migrant and seasonal workers as its primary labor source for tasks such as planting, thinning, culling, and processing. Many of these workers in all of these states come from Mexico. The Center for Urban and Regional Affairs at the University of Minnesota, for example, estimates that 28% of the migrant and seasonal farm workers (MSFWs) in their state come from Mexico, with another 8% coming from Texas (a state with a very large Mexico-born immigrant population) (Contreras, Duran & Gilje 2001). Indeed, MSFWs perform such a vital role in the economy of Minnesota that the state government commissioned a report estimating their effects (Ryan 1997). And a government-commissioned report on farmworker housing in Washington state points up the dependency of its labor-intensive crops on migrant and seasonal labor and estimates that 64% of the workers in Washington and Oregon are undocumented immigrants, mostly from Mexico (Wilkerson 2007). Oregon later commissioned a report that reached similar conclusions (Larson 2002).

Why would a predominance of Mexico-born migrant workers matter for integration? There are two aspects of integration that are tapped in the overall integration score: economic and cultural. With regard to the economic, it may be that the Mexico-born in these states have a disproportionate number of these types of jobs, which would mean that this is their ethnic “niche” in the economy (Waldinger 1999). To the extent that having information regarding their occupation increases the ability of the neural network model to discriminate between them and the native-born, the integration score will be lower. Whether or not this is what is happening is something we can determine by examining the census data from which the scores were generated.

And the evidence does indeed support these claims.⁶ In Minnesota, 46% of all Mexican-born in the state work as “plant machine operators and assemblers” (the category that includes seasonal food processing work) or “elementary occupations” (the category that

⁶Note that all of the statistics in this paragraph are calculated for individuals between 25 and 65 years of age in the 5% IPUMS US Census subsample—they are thus good estimates, but not official US government figures; also, cases coded as “niu” (Not In Universe) *are* included in the denominator when calculating percentages.

includes unskilled agricultural labor). In contrast, only 15% of the native-born in the state work in these industries. In Washington, the comparable figures are 45% and 11.7% respectively, and in Oregon, 46% versus 13.6%.

With regard to the cultural dimension, it may be that regular contact with migrants from their home country serves to maintain the cultural distinction of the Mexico-born in these states, which would also result in lower integration scores. This we can only speculate, but it seems fairly intuitive.

Louisiana is another matter. The Mexico-born there exhibit much greater integration than expected given the state's social capital index score. What makes it such a unique case? Louisiana has a great deal of ethnic diversity (Creole, Cajun, African-American, many Latin Americans (e.g., Hondurans, etc.)) and recent research, including work by Robert Putnam himself, suggests that this may function to suppress social capital in the state (Putnam 2007). The predominance of Catholicism there, however, may provide incoming Catholics a ready social network that can help them integrate into society (e.g., finding jobs, places to live, etc.). This would be an intriguing theory to test, but it is beyond the scope of the current study. It may suffice for the present purposes merely to note that Louisiana is clearly an outlier (and a powerful leverage point) when compared to the dominant trends illustrated in the dataset. This alone warrants its exclusion.

Additional evidence to suggest that excluding these cases is the right choice can be found in Figure 5.8. Here we see that both immigrant access to welfare and multicultural disposition show the same pattern as social capital when the outliers are dropped.

Having thus examined the data, we are now ready to proceed with multivariate analyses.

5.4.2 MULTIVARIATE ANALYSES

As can be seen in Table 5.5, the multivariate models exhibit the same overall patterns as the scatter plots examined in the previous section. It is refreshing to see that the relationships hold even when controls are included, however.

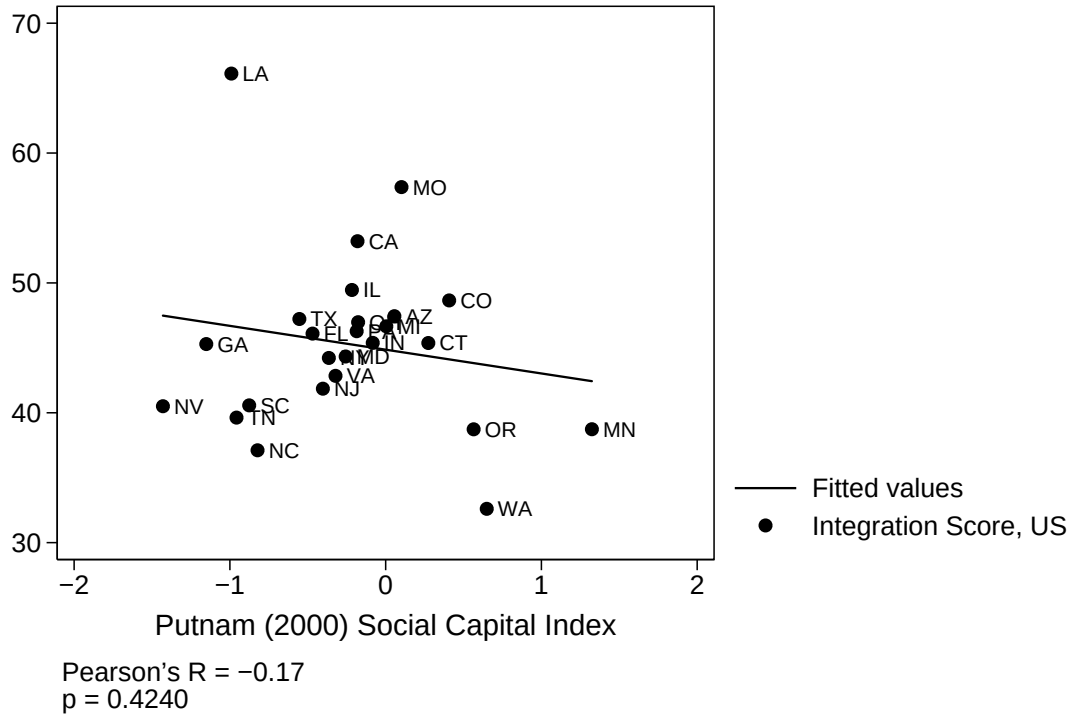


Figure 5.6: Bivariate Regression Plot: Social Capital (All States)

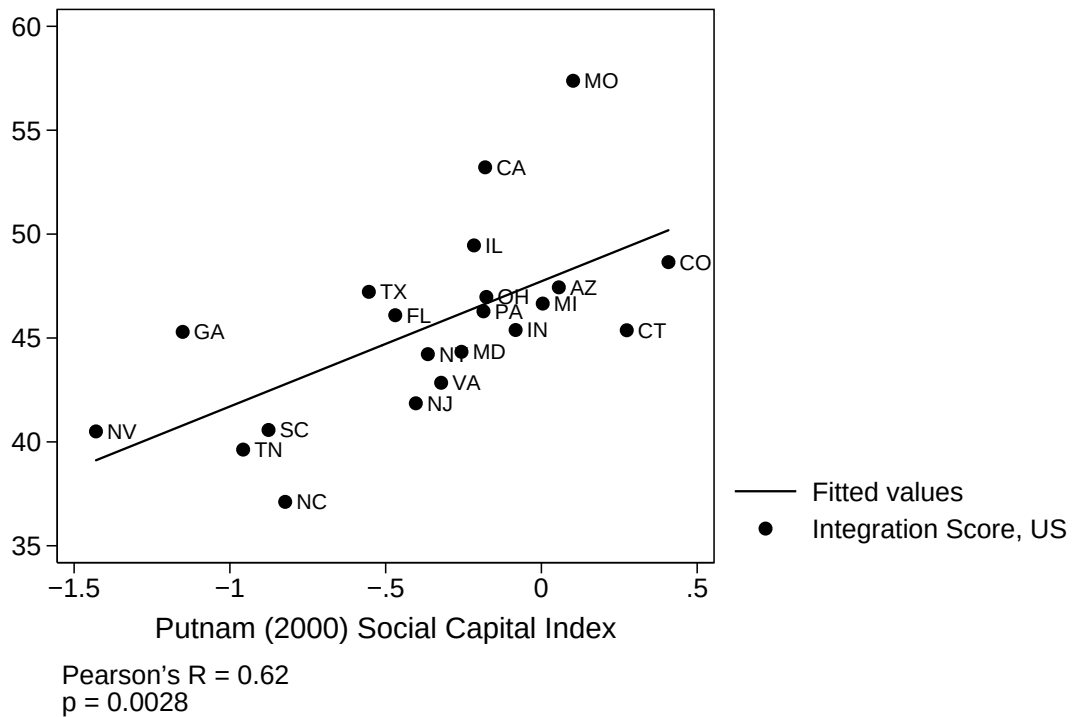


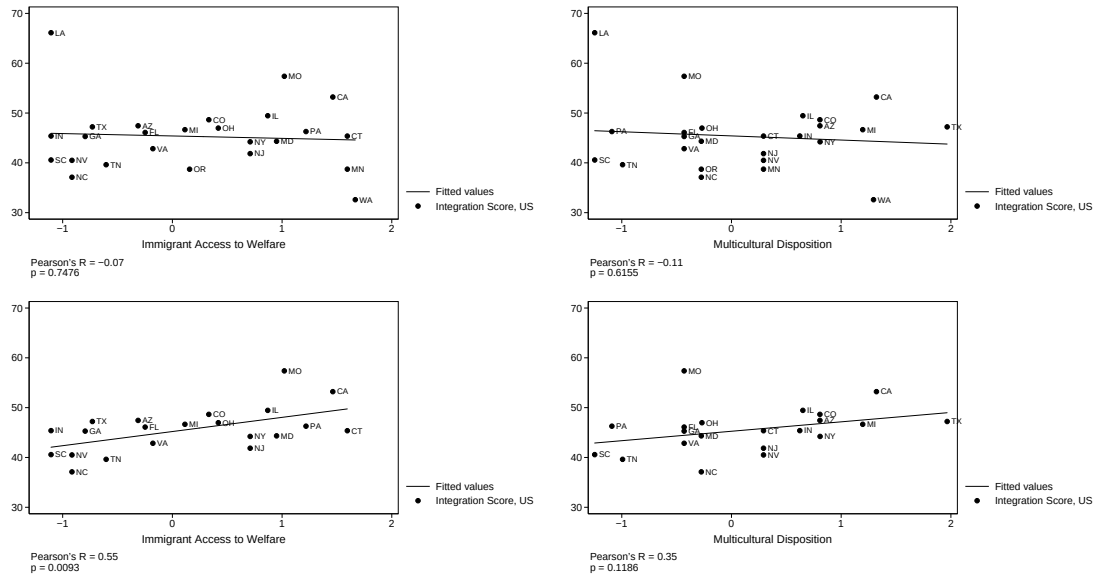
Figure 5.7: Bivariate Regression Plot: Social Capital (Outliers Excluded)

	Posterior Mean (Std Deviation)	
	[Model 3]	[Model 4]
Social Capital, β_1	2.819 (3.582)	8.602** (3.264)
Immigrant Access to Welfare, β_2	-2.779 (2.335)	-1.96 (1.829)
Multicultural Disposition, β_3	-2.455 (1.958)	-1.032 (1.405)
Unemployment, β_4	3.335 (1.867)	5.102** (1.816)
Urbanization, β_5	0.2997** (0.1358)	0.0489 (0.1162)
Constant, α	8.022 (8.605)	23.31** (9.206)
R^2	0.58	0.94
Adj. R^2	0.47	0.92
SSE	1284	350.2
MSE	51.37	16.68
N	25	21

Note: Dependent variable is US measure. Sample is limited to Mexico-born. ** 95% credible interval does not contain zero. Results reported for thirty thousand iterations of two MCMC chains after a two thousand iteration burn-in period.

Table 5.5: OLS Analyses of Mexico-born Immigrant Integration Across US States

Change in Bivariate Regressions After Outlier Exclusion



Note: Top row graphs include all cases; bottom row excludes WA, OR, MN, & LA. All graphs are presented on the same x/y scales to facilitate comparison.

Figure 5.8: Changes in Bivariate Coefficients After Outlier Exclusion

Model 3 includes all states for which data are available, and none of the posited relationships are evidenced in the results. Just as in the multilevel models presented earlier, urbanization takes most of the explanatory power upon its inclusion (see its posterior plot in Figure 5.10). Unemployment makes a stronger showing in this model than it did earlier, though; as Figure 5.9 clearly shows, its 90% credible interval does not include zero.

Once the outliers are excluded in Model 4, though, the results change dramatically.⁷ Social capital has a strong and credible positive effect, as does unemployment, and the adjusted R^2 jumps from 0.47 to 0.92, showing that the model accounts for a full 92% of

⁷These same states (Washington, Oregon, Minnesota, and Louisiana) were also dropped from Model 2 to see if its results would change similarly, but doing so made no such difference.

the variation in integration scores for the Mexico-born across states. In fact, every gauge of model performance is radically improved.

Comparing Model 4 to Model 2 from the earlier multilevel analyses can show how the Mexico-born differ from the mean calculated across all the groups. Social capital matters for the Mexico-born, but multiculturalism and welfare state access do not seem to. Urbanization does not matter as much to the Mexico-born as to other groups, and unemployment is actually *positively* related to their integration. These last two make good sense; urbanization likely doesn't matter because immigrants from Mexico often tend to work in industries that require physical labor but do not require an urban environment, such as farming, construction, and landscaping. That unemployment is positive can be explained by the fact that the Mexico-born often have lower-paying jobs and it is likely that the higher the unemployment rate in a given state, the more the distribution of income among the native-born in that state parallels that of the Mexican immigrants.

5.5 CONCLUSIONS

In this chapter, we have enlarged our dataset, honed our measurements of key variables, and brought in a richer, more qualitative understanding of a particular group in order to get more accurate and intelligible results. We have found that although economic and structural variables trump the attitudinal and policy indicators on average, the same does not hold true when we focus on a single group. Social capital does indeed increase the integration of the largest and most politically salient immigrant group in the United States, the Mexico-born.

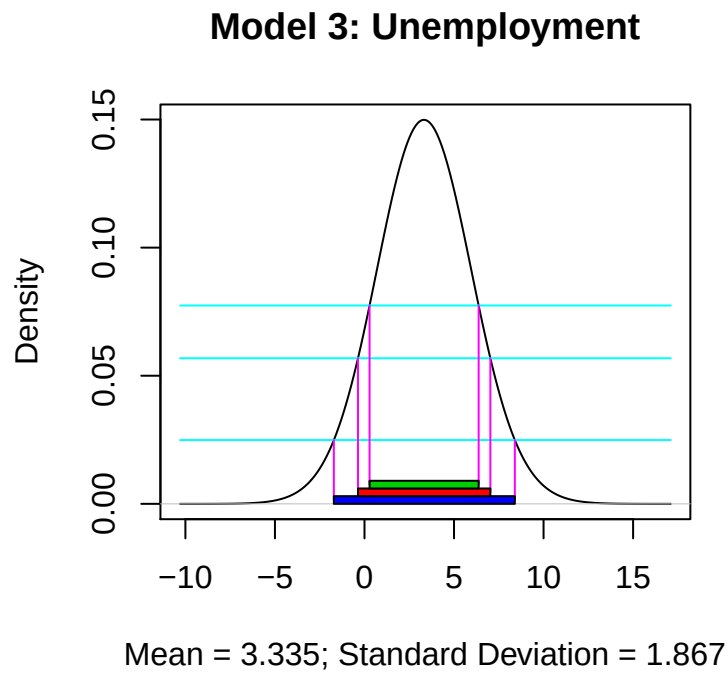


Figure 5.9: Posterior Distribution: Model 3, β_5

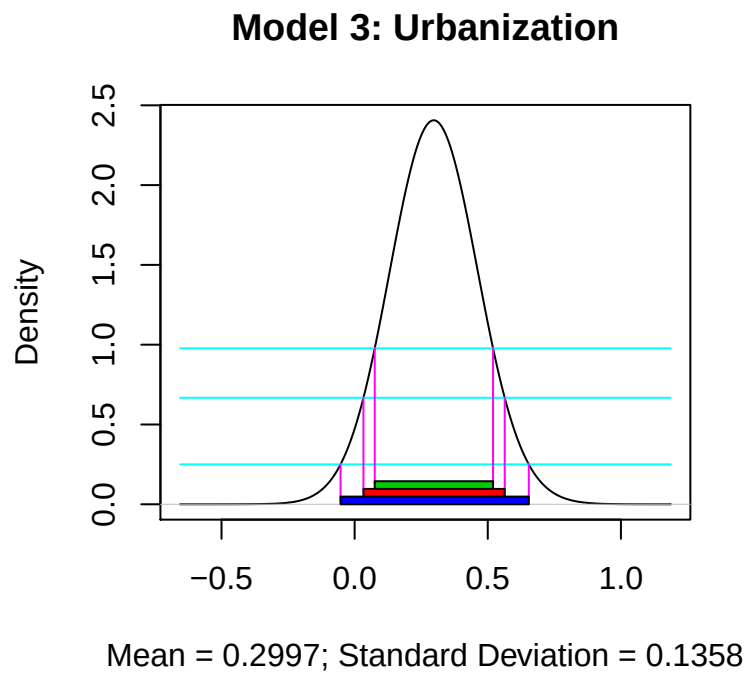
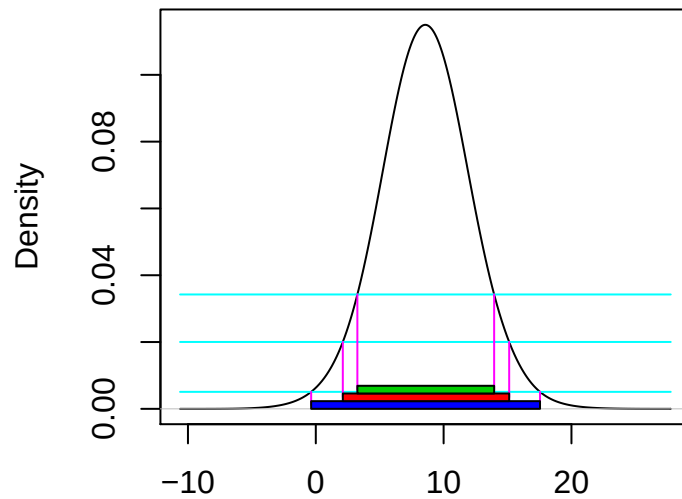


Figure 5.10: Posterior Distribution: Model 3, β_6

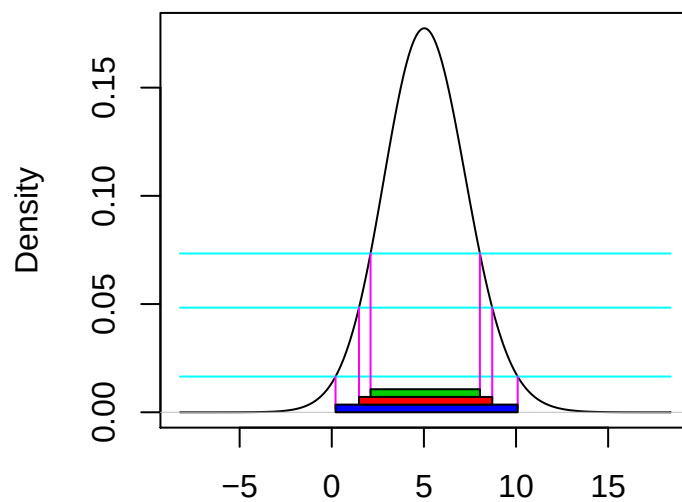
Model 4: Social Capital



Mean = 8.602; Standard Deviation = 3.264

Figure 5.11: Posterior Distribution: Model 4, β_2

Model 4: Unemployment



Mean = 5.102; Standard Deviation = 1.816

Figure 5.12: Posterior Distribution: Model 4, β_5

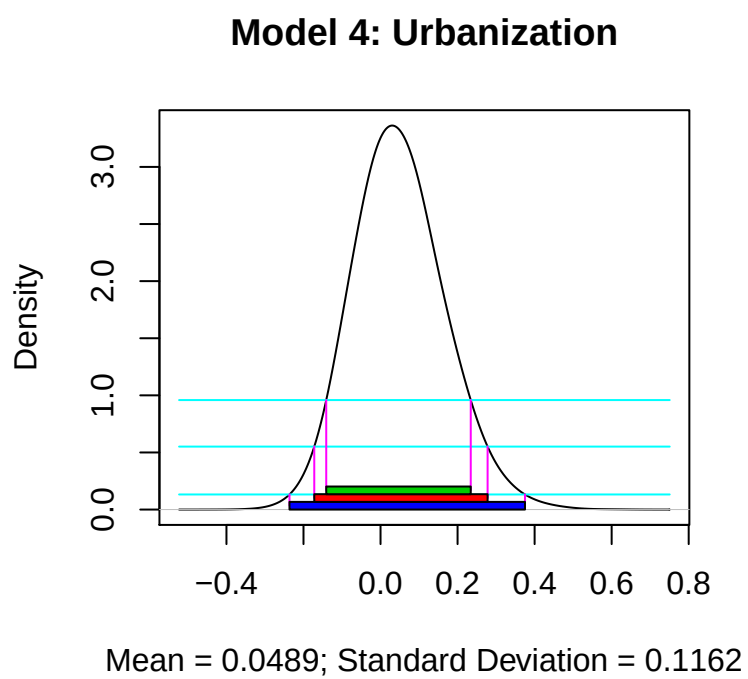


Figure 5.13: Posterior Distribution: Model 4, β_6

CHAPTER 6

IMPLICATIONS AND SUGGESTIONS FOR FUTURE RESEARCH

Before discussing the substantive results of this work, a word on their generalizability is in order. Because the cross-national tests in chapter four were so limited, it is difficult to draw firm conclusions regarding how the variables in question operate on average across country contexts. This lack of data was addressed by disaggregating across the US states, but even though the indicators vary satisfactorily across the states, they are nested in a single country. The broad compatibility of the results of the US analyses with the cross-national ones suggests that the concepts at play (integration, multiculturalism, the welfare state, and social capital and trust) relate to one-another similarly across contexts, but there are well-documented reasons to suspect that this may not be so and the fact is that the available data are too limited to allow us to draw firm conclusions on the matter.

That said, we have made several contributions to the existing literature. First and foremost, the inclusion of host society-level social capital and trust as a determinant of integration outcomes is a significant theoretical achievement. In order to test the validity of that argument, we created a novel measurement of immigrant integration using sophisticated techniques that are not widely employed. In so doing, we made the argument for the greater consideration of complexity in political analysis. We then leveraged this measurement to illuminate existing controversies concerning the effects of the welfare state and multiculturalism on integration.

We demonstrated that the welfare state (both in terms of its expansiveness and the ability of immigrants to access it) tends to decrease integration and that multiculturalism and social capital (both trust and a broader index measure) tend to increase it, but that these effects

disappear on average when geographic and economic controls are included. These effects are consistently evidenced, although they must be interpreted with caution because of the aforementioned concerns regarding their generalizability. Taken at face value, however, *these findings call into question the very relevance of a large swath of debates in the literature over the last twenty years, as well as the very ability of national governments to leverage control over their immigrant populations' propensity to integrate.*

But the situation is not as bleak as it might initially seem. When we took a closer look at a single immigrant group in a single country and brought in additional qualitative information to aid in the elimination of outlier cases, we found that the previously observed average effects changed; urbanization lost its effect, unemployment went from negative to positive, and social capital indeed was shown to have a positive influence on integration.

These results suggest that structural and economic variables do indeed trump the examined policy factors on average, but that this statement must not be overemphasized. The case study showed that each of the factors can affect different groups in different ways and so this may obfuscate the relationships when the effects are modeled on a mean integration score that is calculated across groups. The fact that the impact of structural determinants differs depending on the group suggests that if policy is to make a difference, it must be tailored to the needs of specific groups. In order to best accomplish this, it would be prudent for national governments to allow subnational units to tailor the policies rather than enacting more general policies at the national level.

This we can say with some conviction, based on the analyses presented herein. But as to what the *content* of those policies ought to be, we cannot speak at this time because we do not yet know how group-level determinants may interact with host society-level determinants to affect integration outcomes. It is precisely here that there is an opportunity for further research.

Although much work has been done to theorize the determinants of integration at the group level (as reviewed in chapter one), the variables identified in those studies must be

interfaced with the host society-level variables identified herein to further flesh out the interdependencies in these relationships. It may well be, for example, that the ability of multiculturalist policies to enhance a group's integration potential depends upon the social and cultural distance of that group from the host society, or that the effects of welfare state inclusiveness vary depending on a group's average level of education. The specification of germane group-level variables might be pursued quantitatively within countries first, in order to control for country-level determinants. The models developed there could then be applied in various country contexts to investigate possible cross-level interactions. As currently configured, the integration scores only allow characteristics of the respondent's country of birth to be used as group-level determinants, but they can and should be recalculated at various germane levels of analysis within countries (at the city level, perhaps) and interfaced with other data at those levels to investigate other possible determinants.

The primary barrier to these tests is data availability, for as one disaggregates the unit of analysis (from country to state to metropolitan area, for example), more data are required to compute the integration scores. If one were to have access to full census data from one or more countries (or at least to larger subsamples), many more possibilities would be open.

Also, the integration score itself might be meaningfully calculated for multiple dimensions of the concept. As currently conceived, it measures integration with respect to the indicator variables used in its construction. These indicators could be factor analyzed and clustered to capture unique dimensions (economic, cultural, attitudinal, etc.), then hypotheses regarding each of these could be tested separately.¹ There is no reason that the general measurement approach developed in chapter two could not be applied with equal facility to survey data to discern the degree to which immigrants' value orientations are similar to those of host society

¹For example, we specifically omitted indicators such as the religion of the respondent from our measure herein because including it would have rendered tests regarding multiculturalism nonsensical, as multicultural policies are designed to actually *encourage* the maintenance of just these sorts of differences. But there can be no doubt of the germaneness of religion to debates regarding integration, particularly with regard to Muslim immigrants in the post-9/11 Western democracies.

members, for example.² There is certainly a viable grant opportunity for original work here. The resulting individual scores could be weighted appropriately (equally to start with) and combined to form an omnibus measure for overall testing, as well.

The excellent dataset provided by Banting et al. (2006) might also be expanded either across countries or across levels within countries, and/or perhaps supplemented with measures of more actively assimilationist policies, as this might allow us to tease out more distinct relationships.

Overall, then, there are four primary conclusions to be drawn from the analyses herein. First, social capital and trust in the host society must be considered when assessing determinants of integration outcomes; we have provided a compelling theoretical rationale, as well as statistical analyses, documenting why this is so. Second, the impact of host society-level determinants (whether political, attitudinal, economic, or geographic) varies by immigrant group, and possible cross-level interaction effects must be investigated in future research with an eye toward informing policy decisions. Third, thoughtful and productive quantitative examination of the integration phenomenon is possible; the measurement of integration developed in chapter two is a useful and innovative tool, and it must be expanded upon in future endeavors.

Finally, we have shown that this is a very fertile research area and that the tools developed herein can and should be used to explore it much further.

²Currently, the only barrier to this is data availability. Precious few surveys exist that are constructed with deliberate oversampling of the germane subpopulations in mind. One notable exception is Debbie Schildkraut's (2010) *Twenty-First Century Americanism* survey, but even it only oversampled a very small subset of immigrant populations. Another is Princeton University's *New Immigrant Survey*—but the problem here, for the purposes of assessing integration, is that the survey is only administered to those who have recently been granted permanent residence (a “green card”) in the United States, which is itself a notable indicator of integration.

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