UNIVERSITY OF CHICAGO

CROSS-COUNTRY VARIATION IN THE STIGMATIZATION OF PEOPLE WITH SCHIZOPHRENIA

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Chapter 1. Introduction

This dissertation is a quantitative analysis of the stigmatization of schizophrenia in seventeen countries. The central question is "Why is schizophrenia stigma more intense in some countries than in others?".

The stigmatization of people with mental illness is generally regarded as extremely widespread ("Most stigma research to date has considered the stigma of mental illness to be a universal occurrence", Koschorke, Evans-Lacko, Sartorius, and Thornicroft, 2017, pg. 67). This is especially true for schizophrenia. In reviews involving dozens of countries, researchers have found that the stigmatization of people with schizophrenia tends to be worse than that of several other mental illnesses such as alcoholism and depression (Room, Rehm, Trotter, Paglia, et al., 2001; Angermeyer and Dietrich, 2006).

The consequences of stigmatization for people with schizophrenia are often severe. They can include decreased self esteem (Struening, Perlick, Link, Hellman, et al., 2001; Livingston and Boyd, 2010), rejection by family and friends (Thornicroft, Brohan, Rose, Sartorius, et al., 2009; Thornicroft, 2006), loss of employment (Üçok, Brohan, Rose, Sartorius, et al., 2012), increased risk of suicide (Sharaf, Ossman, and Lachine, 2012), and violations of fundamental human rights (Drew, Funk, Tang, Lamichhane, et al., 2011). Discrimination against people with schizophrenia is common to many countries (Rose, Willis, Brohan, Sartorius, et al., 2011).

However, despite the apparent ubiquity of schizophrenia stigmatization and its consequences, there is extensive variation in its nature and intensity between countries. What can explain this variation?

One major strain of research has focused on the role of culturally available understandings of mental illness. Included in this are comparisons of the stigma associated with indigenous versus medical beliefs about mental illness (Koschorke et al., 2017 give examples). A large and influential

subset of this work, most often done in Europe and America, focuses on the relationship between biogenetic and psychosocial understandings of illness and their consequences for stigmatization.

Studies of this type that connect mental illness-related beliefs and experiences to stigma take individuals as their unit of analysis. Their conclusions help explain why a given person might have a more stigmatizing view of a person with schizophrenia than do others. This in turn might shed some light on why countries have differing average levels of stigma: it might be because beliefs or other individual characteristics that lead to higher stigma scores are more prevalent in one country than in another.

However, there are almost certainly a variety of supra-individual reasons for why countries exhibit variation in how stigmatized schizophrenia is. Because theories of the kind described above stop with the content of individual minds as the source of stigma, they do not allow for consideration of how macro-level social phenomena are implicated. Social reasons that transcend individuals are under-explored, a problem which has repeatedly been observed by scholars (e.g., Lin and Kleinman, 1988; Parker and Aggleton, 2003; Scambler, 2004; Pescosolido, Martin, Lang, and Olafsdottir, 2008; Bonnington and Rose, 2014).

This dissertation proceeds in three parts. First, I address the gaps in existing knowledge about the individual-level relationship between beliefs and stigmatization. Using these results, I consider the explanatory value of individual-level characteristics in explaining why countries' levels of public stigma differ from each other. Finally, I turn away from individual-level characteristics to consider how a particular characteristic of countries' economies (the relative prevalence of employed versus self-employed work) is related to stigmatization. I illustrate that the explanatory power of this characteristic outweighs that of the individual-level effects considered.

Thus, the goals of this dissertation are to:

1. Understand the relationships between etiological, prognostic, and blaming beliefs and stigma at the individual level, especially if and how these relationships vary internationally.

2. Describe international differences in levels of public stigma, and characterize their significance.
3. Evaluate the extent to which differences in stigmatization intensity from country to country can be explained by the individual-level social and demographic dissimilarities of their populations, especially variations in the prevalence of beliefs shown to be relevant in point 1.
4. Pursue the idea that characteristics of countries, in addition to characteristics of the individuals in those countries, affect levels of public stigma.
5. Identify a country-level characteristic that may be associated with lower levels of public stigma and test the hypothesis that it is associated. The characteristic considered is the availability of supportive work in a country.
6. Quantify the explanatory value of this characteristic for cross-country variation in levels of public stigma and contrast it with the explanatory value of individual characteristics.

In the rest of this chapter, I describe two key terms used in this dissertation (schizophrenia and stigma), introduce the dataset, describe the measures and methods that are common to all chapters, and give an overview of the dissertation.

Defining Schizophrenia

Schizophrenia is the medical name for a cluster of symptoms characterized by severely reduced affect or initiative, disorganized speech or behavior, and delusions or hallucinations (DSM-5: APA, 2013). To qualify medically as schizophrenia, two of these three kinds of symptoms must be present and have persisted for a period of at least 6 months, resulting in a marked decline in ability to function at work or interpersonally, or to preserve standards of self-care. The dominant

medical view (although of course not the only one) of schizophrenia is that it is a brain disease[1] caused by a combination of genetics and environment (Owen, Sawa, and Mortensen, 2016). The set of environmental factors is the subject of considerable debate, but may include environmental "insults" such as drug use, head injury, or maternal infections (Owen, Sawa, and Mortensen, 2016 give a list), or psychosocial factors such as stress (Gomes and Grace, 2017) or childhood trauma (Read, van Os, Morrison, and Ross, 2005). However, the causal role of psychosocial factors is widely debated and "controversial" (Morgan and Fisher, 2007). Read, Bentall, and Fosse (2009) write that "Most genetic and brain researchers, however, have either ignored the psycho-social causes of psychosis or relegated them to the role of triggers or exacerbators of a vulnerability which they assumed to be genetic" (pg. 299).

Schizophrenia is generally regarded by the medical establishment as "a neurodegenerative chronic condition with a very pessimistic outlook" (Brassan, Grohs, Matos, and Shergill, 2018, pg. 1) and "the traditional and still common perspective of schizophrenia is that this is an intractable illness with a dismal prognosis" (Jeste, Palmer, and Saks, 2017, pg. 227).

Traditionally, it has been reported that lifetime risk of schizophrenia is fairly constant across populations and sub-populations at around 1% (DSM-IV: APA, 1994). However, more recent work has suggested that global lifetime risk is rather lower (0.4%-0.7%) and that it may vary from population to population (McGrath, Saha, Chant, and Welham, 2008; Saha, Chant, Welham, and McGrath, 2005). For example, developed countries may tend to have higher prevalences than developing countries, and within countries, recent immigrants, men, and urban dwellers are more likely to experience schizophrenia than others (McGrath, Saha, Welham, El Saadi, et al., 2004).

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[1] The most popular medical explanation for schizophrenia is the dopamine sensitivity hypothesis, which proposes that problems with dopamine receptors in the brain lead to the symptoms of schizophrenia (Howes and Kapur, 2009). This idea was initially developed in the 1960s after the discovery that chlorpromazine was useful as an anti-psychotic drug (Gründer and Cumming, 2016). Dopamine receptor targeting continues to be the main method for chemical treatment of schizophrenia (Li, Snyder, and Vanover, 2016).

In this dissertation, the concept of schizophrenia is not problematized. This is because respondents respond to a vignette which does not give a name to what the vignette person is experiencing. Respondents are not responding to the label 'schizophrenia' but to a description of a person's situation which a psychologist or psychiatrist would likely characterize as such.

Defining Stigma

Goffman is perhaps the seminal figure in stigma research. He defines a stigma as a type of attribute that is profoundly discrediting for a person of a given sort to possess (Goffman, 1963). A mark of this type sets possessors apart from 'normal' others, spoiling their social identities and disqualifying them from complete acceptance.

Over time, the stigma concept has been the subject of debate, criticism, and redefinition. Some have noted the problematic nature of conceiving of stigma as a mark or attribute, since that implies that there is a problem in the person, and ignores the role that society plays in 'detecting' and making significant certain differences (Parker & Aggleton, 2003). Stigma research has been criticized as overly focused on individual psychological processes (Oliver, 1992), as insufficiently attentive to the actual experiences of stigmatized people (Kleinman, Wang, Li, Cheng, et al., 1995), as paying insufficient attention to moral contexts (Kleinman and Hall-Clifford, 2009), and as ignoring power (Link & Phelan, 2001; Parker & Aggleton, 2003) and social structures (Scambler, 2009). These critiques have been taken seriously and have resulted in a strengthening and enrichment of the literature on stigma.

In this section, I describe three key definitions of stigma and explain how I use the term in this dissertation.

Goffman

As stated, Goffman defines a stigma as a type of attribute that is profoundly discrediting for a person of a given sort to possess, such that their identity is spoiled (Goffman 1963). However, he also defines stigma as a "relationship between an attribute and a stereotype [of normalcy]" (pg. 14). A person with a stigma is "reduced in our minds from a whole and usual person to a tainted, discounted one" (pg. 3), possessing "an undesired differentness from what we had anticipated" (pg. 4). As Goffman makes clear, a stigma is not just an attribute in and of itself, but a relational problem. This is in two senses: the relationship between the way the person is and contextualized expectations of normalcy, but also in the social relations existing between the person and others. What is damaged by a stigma is others' sense of the person and how they feel they should relate to him: "an individual who might have been received easily in ordinary social intercourse possesses a trait that can obtrude itself upon attention and turn those of us whom he meets away from him, breaking the claim that his other attributes have on us" (pg. 4).

Link and Phelan

Link and Phelan (2001) describe stigma as the outcome of a confluence of circumstances or events. First, human differences are noted and labeled. Cultural beliefs associate undesirable characteristics (negative stereotypes) with the label, and labeled people are seen as "them" rather than "us". Labeled persons experience status loss and discrimination, and power is required to enact each of these. Thus, stigma happens when "elements of labeling, stereotyping, separation, status loss, and discrimination co-occur in a power situation that allows the components of stigma to unfold" (p. 367). Emotional reactions such as anger or fear, prompted by the first three components, were later added to the set (Link, Yang, Phelan, and Collins, 2004).

This reconceptualization makes at least three major changes to the concept at presented by Goffman. First, it folds into the definition of stigma a variety of concepts that were previously

separate (for example, discrimination is treated as an element of stigma). Second, whereas in the original theory cultural conceptions of mental illness could be interpreted more broadly, they are here essentially limited to stereotypes. Third, by bringing power in, Link and Phelan refocus attention on how structural elements of social life are implicated in mental illness stigma.

Yang and Colleagues

Yang and colleagues have conceptualized stigma as a fundamentally moral process, threatening "what matters most" for stigmatized and stigmatizers alike. Stigmatization is "a highly pragmatic, even tactical response to perceived threats, real dangers, and fear of the unknown" (Yang, Kleinman, Link, Phelan, et al., 2007, p. 1528). Cultural values and practices as well as social structures impact what matters most, how stigma is enacted, and why. Critically, these are not just a matter of institutional policies and inertia or of individual beliefs about stigmatized conditions, but also the "felt flow of engagements in a local social world" (p. 1528), where "the moral standing of individuals and groups in local context affects the transmission and outcome of stigma" (Kleinman & Hall-Clifford, 2009, p. 418). Beliefs about schizophrenia cast sufferers in the role of social incompetent, one who is incapable of fulfilling such obligations in a reasonable manner (Yang & Kleinman, 2008). For Yang and colleagues, stigmatization of people with schizophrenia is a reaction to social realities that make affiliation with someone who is (rendered) unable to "engage in social exchanges linked to crafting a moral life" (Yang, Chen, Sia, Lam, et al., 2014, pg. 85) a fundamentally dangerous thing to do.

Yang and colleagues add to earlier definitions: "Here the dialectics that defined the sociological approach can be seen to be deepened or thickened. Responses are not only determined by cultural imperatives, meanings, or values, but refer to a real world of practical engagements and interpersonal dangers" (Yang et al. 2007, pg. 1528).

Stigma in this Dissertation

For this dissertation, all three conceptualizations are useful, but I rely primarily on Yang and colleagues and Goffman for defining the stigma concept. Thus, in this dissertation, "a stigma" is used to indicate a social identity that, in a given context, is deeply discrediting in the manner that Goffman describes. "Stigma" is used to indicate the existence of injury to relationships done by possessing a stigma. A critical aspect of this response is its apparent naturalness and necessity from the perspective of the stigmatizer, as described by Yang and colleagues.

Link and Phelan's contribution is used, but I do not treat it as a definition of stigma. There are two reasons for this. Most prominently, it is in my view undesirable to overemphasize stereotypes, as is done by making them part of the definition of stigma. Parker and Aggleton (2003) have pointed out the preponderance of studies that even equate the two concepts. However, this once again returns the focus to and places the problem within individual minds, short-circuiting the move toward understanding stigma as social in any but the most limited sense. The individualistic emphasis is a frequent complaint about stigma work, and is at least partially derived from the dominance of social psychological work in the field. Link and Phelan specifically note the importance of social psychological studies on cognitive perception of stereotypes to their definition.

In addition, rather than being seen as simply one thing co-occuring with the others that Link and Phelan mention, stereotypes are often regarded as the cause of separation, status loss, and discrimination. This negates the value of having stigma as a separate concept, with stigma theory just becoming the theory of stereotyping, again allowing stereotypes to dominate. While this may not be a necessary way to read Link and Phelan's argument, treating their understanding of stigma as defining a stigma process (first things are labeled, then stereotypes are developed, then people are seen as them rather than us, then they are discriminated against) encourages this perception. This is part of the second reason why I rely less on the Link and Phelan definition. By folding several

previously separate concepts (e.g., discrimination[2], stereotypes) into the stigma concept itself rather than treating them as related to but different from it, the concept risks losing coherence and becoming overloaded. By cleanly separating stigma from other related concepts, more room is made for important analyses as well, such as understanding the nature of the relationship between stigma and stereotypes.

It is worth noting that Goffman appeared to have a quite different model of the relationship of stereotypes to stigma. The centrality of stereotypes to Goffman's arguments has sometimes been overstated, apparently based on a misunderstanding of the oft-quoted "A stigma, then, is really a special kind of relationship between attribute and stereotype" (Goffman, 1963, p .14). The stereotype he refers to is not a stereotype of what the stigmatized person is like, but rather a stereotype of what constitutes normalcy for a given type of person in a given situation. For him, stereotypes are part of stigmatizers' "stigma theory, an ideology to explain [the stigmatized one's] inferiority and account for the danger he represents" (p. 15). In other words, Goffman treats stereotypes as a rationalization of the sense of spoiled identity, they are not responsible for the actual spoliation. Similarly, I regard stereotypes as one of many possible signs of stigma, not as its source or as a necessary subcomponent.

However, I do use Link's and Phelan's contributions in several ways. They have been widely praised for incorporating power as an element of stigmatization. This has the effect of delimiting when it is appropriate to identify negative thoughts and feelings against a person or group as stigma. It is in their model only appropriate when others' "cognitions carry sufficient clout in social, cultural, economic, and political spheres to lead to important consequences for the group that has been labeled as different" (Link and Phelan, 2001, pg. 378). There is little doubt that this is the case for

[2] Deacon (2006) makes an argument for why discrimination should not be included as part of the definition of stigma.

people with schizophrenia. Including power also explicitly allows for a consideration of the roles of institutions and other supra-individual entities in promoting stigmatization.

Another useful aspect of the Link and Phelan definition is that, by identifying the elements of stigma, they are also pointing out what a measurement of stigma should address (Measuring Mental Illness Stigma, Link et al. 2004). Also important for measurement is that Link and Phelan (2001) characterize stigma as a matter of degree, rather than something that is merely present or absent. I describe later how stigma is measured in this dissertation.

Data and Methods

Data

The primary data source is the Stigma in Global Context - Mental Health Study (SGC-MHS) (Pescosolido, Martin, Long, and Smith, 2011). In this study, respondents from eighteen countries were given a vignette intended to describe someone with either depressive disorder, schizophrenia, or asthma. The vignette was based on that used in the 1996 General Social Survey. Respondents were not told what illness the vignette was intended to represent. The name of the person described in the vignette was varied across countries to reflect nativity, and varied within each country to reflect different genders and racial/ethnic groups. In this dissertation, I only consider data for the schizophrenia vignette, the United States versions of which are below:

> John/Mary (White)/Tyrone/Shontell (Black) is a White/Black man/woman. Up until a year ago, life was pretty okay for John/Mary (White)/Tyrone/Shontell (Black). But then, things started to change. He/She thought that people around him/her were making disapproving comments, and talking behind his/her back. John/Mary (White)/Tyrone/ Shontell (Black) was convinced that people were spying on him/her and that they could hear what he/she was thinking. John/Mary (White)/Tyrone/Shontell (Black) lost his/her drive to participate in his/her usual work and family activities and retreated to his/ her home, eventually spending most of his/her time on his/her own. John/Mary (White)/ Tyrone/Shontell (Black) became so preoccupied with what he/she was thinking that he/ she skipped meals and stopped bathing regularly. At night, when everyone else was sleeping, he/she was walking back and forth at home. John/Mary (White)/Tyrone/ Shontell (Black) was hearing voices even though no one else was around. These voices told him/her what to do and what to think. He/She has been living this way for six months.

Respondents were then asked 75 questions about the person described in the vignette (whom I will call V for the rest of this dissertation), and about mental health in general. These questions focused variously on respondents' knowledge and beliefs, attitudes, and behavior (respondents will be called R for the rest of this dissertation). Demographic and socioeconomic data was also collected. All data was collected in face-to-face interviews. Countries were contacted through the International Social Survey Program, and countries that agreed to participate were included in the SGC-MHS (Pescosolido, Martin, Long, Olafsdottir, Kafadar, and Medina, 2015). Information on language translations, cross-national comparability, and country-specific variations in fielded questionnaires can be found in Pescosolido and Olafsdottir (2008) and Olafsdottir and Pescosolido (2011).

Data was collected between 2004 and 2011 from nationally representative samples of non-institutionalized adults in eighteen countries, seventeen of which fielded questionnaires with the schizophrenia vignette. The survey had an overall response rate of 65.9%. A total of 8,382 respondents from Argentina, Bangladesh, Belgium, Brazil, Bulgaria, China, Cyprus, Germany, Great Britain, Hungary, Iceland, South Korea, New Zealand, Philippines, South Africa, Spain, and USA responded to the schizophrenia vignette.

The SGC-MHS provides level-1 weights to make data nationally representative for each country based on their multi-stage sampling protocols. Because I use multilevel modeling throughout, an additional adjustment is made to the weights. Weights are standardized across countries so that the sum of weights is equal in each country, which normalizes the scale of the weights across countries and also adjusts for differences in sample sizes by country. This is necessary to avoid biasing the between- and within-country variance estimates (Pfeffermann, Skinner, Holmes, Goldstein, et al. 1998). There are no level-2 weights used, countries contribute equally to all results.

Measuring Stigma

The measurement of stigma in this dissertation is based on the methods used by Pescosolido, Martin, Olafsdottir, Long, et al. (2015), several of whom are principal investigators for the SGC-MHS. However, I make some adjustments that I think are necessary to avoid clouding the concept. Pescosolido et al. treat 33 questions as indicative of stigma. They grouped these into categories of traditional prejudice, negative affect, coercion, social distance, role exclusion, low collective orientation, opposition to state responsibility, and shame in the uptake of benefits.

For this dissertation, I have chosen to exclude those questions addressing coercion, low collective orientation, opposition to state responsibility, and shame in the uptake of benefits from the set of stigma measures. The reason for this is that these questions seem to be as much or more about general political and social beliefs as they are about V. To take an example, one of the questions about opposition to state responsibility asks whether the government has an obligation to provide V with a job. In my view, it is a mistake to attribute disagreement with this to stigmatization of a person with schizophrenia (i.e., to the sense that the person does not deserve to work or should be excluded from working). Instead, it is quite likely that disagreement could stem from the sense that the government doesn't have an obligation to provide anyone with a job. I include only those questions which are about the respondent's sense of what the person with schizophrenia is like, how that person makes the respondent feel, and whether the respondent thinks that that person belongs in normal society. These are the 20 questions about traditional prejudice, negative affect, desire for social distance, and role exclusion.

The available responses to each of these question constitute a 4-point Likert scale, with no neutral category. For each question, a person's response is defined as stigmatizing if she agreed or strongly agreed with limitations in the abilities, appropriate field of action, or social desirability of the person in the vignette. A simple scale ranging from 0 to 100 was constructed from these binary responses, with the score representing the percentage of questions that the respondent answered in

a stigmatizing manner. This is a person's Overall Stigma Score. Questions that the respondent left blank or "didn't know" the answer to were ignored. So, if the respondent answered 15 of the 20 questions, and of these, seven received a stigmatizing response, that person's stigma score would be 47. Eighty-nine percent of respondents are missing answers to three or fewer questions, with 65% missing no answers.

The overall stigma score is intended to give a sense of the degree to which (or the level of intensity with which) the respondent views V as, in Goffman's words, "discredited", "tainted", or "discounted". It is difficult to measure this directly, so it is measured indirectly, through the extent to which the respondent has a bad opinion of or a bad feeling about V, or doesn't want to be involved with V, or thinks that V doesn't belong in normal society. These can be regarded as different manifestations of an underlying feeling of V as problematically different and undesirable. The idea is that the stronger or more profound this sense is, the greater the number of questions addressing these the respondent will agree with.

In addition to the Overall Stigma Score, I also compute three sub-scores: Intolerance (which is a combination of traditional prejudice and negative affect), Desire for Social Distance, and Role Exclusion. A principal components analysis originally indicated the presence of four sub-components to the overall stigma score. However, the fourth sub-subcomponent contained only two elements (*danger to self* and *danger to others*), and the scale formed from these had a low Cronbach's alpha (0.59). In addition, their inclusion in the intolerance sub-scale, where they might fit conceptually, results in a reduction in reliability of that sub-scale. Therefore, I do not include these

questions as part of any sub-scale, but they are included in the overall stigma scale[3]. These sub-scales are also simple scales, with scores ranging from 0 to 10. The set of questions composing the overall stigma scale and the three sub-scales are shown in Table 1.1. The weighted reliability for the overall scale and each sub-scale is shown in Table 1.2.

Table 1.1. Allocation of Questions to Stigma Sub-Scales

Intolerance Sub-Scale		*Role Restriction Sub-Scale*	
V is…	not as intelligent as anyone else	V…	should not be allowed to teach children
	unpredictable		should not be allowed to supervise others at work
	not as productive as most other workers		should not be allowed to hold public office
	not as trustworthy as anyone else		should not be hired
	makes me feel uncomfortable		should not be allowed to have children
	makes me feel nervous	*No Sub-Scale*	
	hard to talk to	V is…	dangerous to self
Desire for Social Distance Sub-Scale			dangerous to others
R is…	unwilling to have V as a neighbor		
	unwilling to have V marry someone related to me		
	unwilling to make friends with V		
	unwilling to work closely with V		
	unwilling to have V care for my children		
	unwilling to spend time socializing with V		

Table 1.2. Scale Statistics for Overall Stigma Scale and Sub-Scales

	Number of Questions	Range	Cronbach's Alpha
Overall Stigma Scale	20	0 - 100	0.87
Intolerance Sub-Scale	7	0 - 10	0.73
Social Distance Sub-Scale	6	0 - 10	0.80
Role Exclusion Sub-Scale	5	0 - 10	0.72
Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)			

Thus, each respondent has an overall stigma score and three stigma sub-scores. These are measures of individual stigma. I now turn to the measurement of public stigma. A country's mean stigma score is the average of the individual stigma scores of each respondent in that country,

[3] A number of studies (e.g., Corrigan, Rowan, Green, Lundin, et al., 2002; Phelan and Link, 1998; Martin, Pescosolido, and Tuch, 2000) have characterized belief in the dangerousness of people with schizophrenia as a cause of stigma. I did not do that here for two reasons. First, dangerousness is a stereotype, and following Goffman, I regard stereotypes primarily as after-the-fact justifications of stigma than causes (which doesn't exclude some action in the other direction but does treat it as less important). Second, dangerousness is intimately connected to the stigma concept in ways that other stereotypes about people with schizophrenia are not. Drawing on Yang and colleagues, a sense of dangerousness is part of the definition of stigma, and not an external cause.

weighted to the population level. I call this value the level of public stigma or the public stigma score for that country. Because it is an average of the individual stigma scores, the range of possible values for the public stigma score is also 0 to 100. In parallel fashion, a country's level of intolerance is the mean intolerance score in that country, and similarly for the other sub-scores. Descriptive statistics are shown in Table 1.3 in the next section.

Controls

All of the models in this dissertation control for respondent demographics, vignette person demographics, and respondent's contact experience. Existing evidence for these characteristics as potential confounders is discussed in Appendix A.

Respondent demographics are age (years), gender (M/F), socioeconomic status (measured as years of education), and race (measured as racial/ethnic minority/majority status). The criteria used to designate a given racial or ethnicity category as majority or minority for each country is discussed in Appendix B.

In this survey, the vignette person also has demographics. V's race/ethnicity and gender were implied by the name used in the vignette, leading to four types of vignette person: male & in-group, male & out-group, female & in-group, female & out-group. Vignette versions were assigned at random to each respondent such that each vignette type was given to a quarter of the sample from each country. I use the gender and race category designations provided by the SGC-MHS.

Respondent contact experience, whose independent relationship with stigma has been described as "well established" (Pescosolido and Manago, 2018), is measured in two ways. The first is whether the respondent has ever known someone who was being treated for a mental illness (yes/no). The second is whether they themselves have ever been treated for a mental illness (yes/no).

Descriptive statistics for these controls are shown in Table 1.3. Missing data is generally minimal except in the case of socioeconomic status (education). No missing data was imputed.

Most respondents missing education data are Chinese. Chinese respondents with missing educational data tended to have very similar stigma scores to those not missing education data (average overall stigma score 43.6 versus 42.8).

Table 1.3. Individual-Level Descriptive Statistics for Controls and Stigma

	Mean	Standard deviation	Min	Max	% Missing
N (Respondents per Country)	493	355	268	1844	—
N excluding China†	409	72	268	514	—
Respondent Demographics					
Age (years)	44.4	34.8	18	97	0.0
Education (years)	10.9	4.5	0	30	3.8
Gender (% female)	51.0	—	—	—	0.0
Race (% minority)	16.8	—	—	—	0.7
Respondent Contact Experience					
% ever known someone with mental illness	44.1	—	—	—	0.9
% ever been diagnosed with mental illness	8.2	—	—	—	0.7
Vignette Person Demographics					
Gender (% female)	49.9	—	—	—	0.0
Race (% minority)	49.2	—	—	—	0.0
Stigma					
Overall Stigma Score	49.5	25.8	0	100	0.3
Intolerance Sub-Score	4.6	3.0	0	10	0.8
Social Distance Sub-Score	5.1	3.3	0	10	0.8
Role Exclusion Sub-Score	4.7	3.4	0	10	1.0

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

Statistics given are based on data weighted to be nationally representative within each country and for each country to contribute equally regardless of sample size.

† China's respondent count is more than triple that of other countries.

Multi-Level Models

Throughout, I use multi-level models as the main method of analysis. A complete description of how these models work can be found in Snijders and Bosker (1999), Raudenbush and Bryk (2002), and Hox, Moerbeek, and Van de Schoot (2010), among others. Here I will briefly review some of the key features and how they are deployed in this study.

First consider the structure of the SGC-MHS dataset. Each individual respondent provides one datapoint. Each respondent has certain characteristics. Some of these are treated as explanatory variables, others are treated as outcome variables. In addition, each individual is a

member of a larger group, her country. Countries also have characteristics which can be treated as explanatory variables or outcome variables. These country characteristics can be aggregates of individual-level characteristics (e.g., mean stigma score in that country) or characteristics that do not reduce to the individual level and are only features of countries (e.g., development status). In short, individuals (level-1) are clustered into countries (level-2), and both levels provide relevant information. Data structured in this way is hierarchical, or multi-level.

Note also that individuals in a given country share a sociocultural context that is likely to make them more like others in their country (with respect to stigma) than they are like people in other countries[4]. In other words, individuals from the same country are not independent. Independence of datapoints is a prerequisite for standard regression. Under conditions where this requirement does not hold, standard errors are biased, leading to Type-1 errors. For this reason, multi-level modeling is statistically necessary to use with this dataset.

In addition to being necessary, multi-level modeling is also useful because it opens up the set of possible questions that can be addressed. There are two kinds of questions enabled by multi-level models that are particularly important in this dissertation. First, one can ask if and how the effect of a given individual-level characteristic varies from group to group. Second, one can ask how much particular individual- or group-level characteristics can explain about the variation in outcomes at either level.

The first kind of question can be answered with mixed effects models, which I briefly explain here. Multi-level models are categorized as either fixed effects models or mixed effect models (also called random-intercept and random-slopes-and-intercepts models, respectively). In a

[4] This is an assumption that can be tested using the intraclass correlation coefficient (ICC), which is the between-group variation divided by the total variation in the outcome (I explain between- and within-group variation later). When this number is close to zero, the group differences contribute very little to the variation in outcomes, meaning that people in different groups are comparatively similar to each other. When it is not close to zero, then group differences are strong, necessitating the use of multi-level modeling. For this dataset, when overall stigma score is the outcome variable, the ICC is quite high at 18%. Multi-level modeling is clearly necessitated.

fixed effects model, the intercept is allowed to vary by group, which handles the clustering issue. However, the model enforces the demand that the coefficient for each variable is the same in every group. As in standard regression models, there is one estimated effect for a given variable, and its coefficient can be interpreted similarly to coefficients in a standard regression model. In contrast, in a mixed effects model, the intercept varies by group as in fixed effects models, but additionally, one or more coefficients are also allowed to vary by group (called a random effect). The average of the country-specific coefficients is reported as well as their variability, and thus can be used to address how the effect of a given individual-level characteristic varies from group to group.

Not all effects are treated as random in a mixed effects model. Whether or not include them as such is based on a combination of statistical testing and theoretical relevance. Likelihood ratio tests (explained more in later chapters) comparing a model with and without a given random effect indicate whether the variation in the coefficient across groups is non-zero. If it is not differentiable from zero, then there is no need to treat the effect as random. From a theoretical perspective, variation in a coefficient across groups may be its own point of interest. For example, in this dissertation, one question is whether the effect of biogenetic etiological beliefs on stigma scores is similar from country to country. It is standard practice, which I follow here, to treat only level-1 effects as random only when there is a theoretical reason to do so because it quickly becomes computationally infeasible to have more than a handful of random effects in a model (Wang, Xie, and Fisher, 2011). As a result, I have chosen to privilege the use of random effects for those level-1 variables that are of substantive interest (etiological, blaming, and prognostic beliefs). For all mixed effects models, I treat random coefficient variances as independent (one unique variance parameter per random effect, covariances assumed to be zero). All coefficients, random effects, and within- and between-group variances are estimated using full maximum likelihood (ML) estimation method.

The second kind of question, how much particular variables can explain about variation in outcomes, is given by the R^2 value when the model is a standard regression model. However, R^2 is

not appropriate in a multi-level model because of the separation of outcome variation into a within-group portion and a between-group portion. This is because multi-level models are actually composed of two equations, one of which is at the individual-level and the other is at the group level, which are combined into one model allowing for simultaneous estimation of parameters[5]. These two equations also contribute distinct residual error terms[6]. Thus, one examines the reduction in each of these separately. A group-level variable can reduce group-level variation only, individual-level variables can reduce both individual-level and group-level variation. In the later case, the reduction is the result of a combination of the individual-level effect of a variable and its varying distribution across groups.

There is one important issue with group-level residual variation regarding this dataset. Because this dataset is not a representative random sample of all countries in the world, group-level variability in outcomes may not be representative of the true variability in the entire population of countries. For this reason, although I show random effects and between-group variation in most models and discuss them where relevant, the values must be taken with a grain of salt. Nevertheless, it is still valuable to consider the random effects where appropriate because they characterize the variation within the dataset, which is useful for the reasons given above, and also because it still represents a best estimate at this point of global variability. It is also important to remember this

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[5] There is a group-level equation of the form $\beta_{0j} = \gamma_{00}+\gamma_{01}Z_j+\mu_{0j}$, where β_{0j} is the outcome of interest, for example the average stigma score in a country j. Z_j is a group-level characteristic, for example the average age of respondents in country j, and γ_{01} is its coefficient. γ_{00} is the average of all individual stigma scores regardless of country, μ_{0j} is the residual error at the country level (the difference between the country j's mean and the overall mean after accounting for average age). Then there is the individual-level equation of the form $Y_{ij}= \beta_{0j}+\beta_1X_{1ij}+e_{ij}$, where Y_{ij} is the stigma score of an individual i in country j. X_{1ij} is, for example, the age of that person, and β_1 is its coefficient (the relationship between a person's age and their stigma score). e_{ij} is the residual error at the individual level (how far away that person's stigma is from their country's mean stigma score after accounting for their age). β_{0j} is as in the country-level equation the average stigma score in country j. The final multi-level model resulting from a combination of the country-level and individual-level equations is $Y_{ij} = \gamma_{00}+\gamma_{01}Z_{j+}\beta_1X_{1ij}+\mu_{0j}+e_{ij}$. All notation in this paragraph is from Hox, Moerbeek, and Van de Schoot (2010).

[6] These correspond to e_{ij} and μ_{0j} in the equations given in the previous footnote.

when discussing fractions of respondents or other study-population statistics: they cannot be presumed to extrapolate to the world population. Ideally future studies will use a larger and more representative sample of countries.

A Note on Development Status

I use country development status as a variable in several analyses. The categorization of countries as developed or developing has been criticized for being ill-defined, pejorative, and ethnocentric, for erasing critical sociocultural differences especially within the developing group, and for implying that similar social and cultural orientations are both inevitable and desirable for all countries and peoples (e.g., Ferguson, 1994; Escobar, 1997; Thornton, 2001; Hobart 2002).

With respect to the pejorative, ethnocentric, and developmental paradigm criticisms, I think that these largely derive from the fact that the developing/developed distinction is so entangled with the development project and its history. In response, I assert here that my use of these terms is not intended as an endorsement of that project or its outlook. I am not using them with the underlying assumption that "developing" is bad and "developed" is good, that developing countries will eventually come to or should strive to resemble Western ideals of lifestyle, social organization, beliefs, or economies, or that the immense differences between developing countries are less important than their differences from developed countries. I think it likely that many scholars who use these terms would say the same[7].

Next consider the critique of development status as erasing critical sociocultural differences within each group, especially the developing group. I agree that the development status concept is

[7] Obviously, some will not agree that it is possible to separate terms from their entanglement with ideological positions or historical uses. But the continuing widespread use of the terms in fields with sensitivity to such problems suggests that the entanglement is not so complete. I also note that alternative terms such as "Global South" or "low-and-middle-income countries" suffer from many of the same problems as development status (ill-defined, erasing differences). Indeed, the more subtle version of the critique that development status terminology implies a hierarchy is that any distinction along these lines is inherently judgmental.

wholly inadequate to address any real questions about culture. However, I do not see that as problematic in this case because understanding cultural contributions to stigma variation is outside the scope of this dissertation and is not attempted here. The role of the development status distinction in this dissertation is primarily to illustrate the presence of variation and to describe its patterning or lack thereof along lines that have previously been seen as relevant in the field. In fact, the main conclusion about development status in this dissertation may be how few of the things investigated here seem to be patterned along development lines.

A related criticism is that the terms developing and developed are ill-defined. However, even conceptually fuzzy terms can be useful in pointing to directions for future analysis. Often when development status is used as a differentiator, patterns found are later explained as actually due to some other (better-defined) thing with which development is associated. For example, with respect to the early finding of a difference in stigmatization by development status, a host of explanations were created to account for this finding: more cohesive societies (Cooper and Sartorius 1977), family structures that encourage acceptance (Waxler 1977), higher levels of social support (El-Islam 1979), and others. In the same way, I regard development status as useful as a rough differentiator here, potentially prompting future analyses to provide the underlying explanation for any observed patterns[8].

Thus far I have explained why, despite agreeing with several of the criticisms leveled against it, I do not think that they make the development status concept unusable in this context. However, one might ask why one would use it at all. My reason is its traditional relevance to multinational studies of stigma. One of the earliest and most influential speculations regarding the stigmatization

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[8] One additional argument could be made. Many concepts are ill-defined and yet constantly used (race is a good example). As long as there is a shared sense of what is meant, being fuzzy does not automatically disqualify a concept from use. The nature of this shared sense is I think revealed by the charge of ethnocentrism: developing countries are countries that do not conform closely to Western ideals of lifestyle and social organization (of course, it does not follow that these countries are therefore problematic or inferior).

of schizophrenia in a global context was that it tended to be less pronounced in developing countries than in developed ones (e.g., Cooper and Sartorius, 1977). There has been some controversy over the truth of this statement (separate from the issue of the developing-developed categorization itself), and Pescosolido et al. (2015) found no difference using SGC-MHS data. However, it remains a relevant divide in the literature, with the lack of representation of developing countries and the possibility of development status differences noted as concerns in several sub-genres: stigma prevalence/intensity (Seeman, Tang, Brown, and Ing, 2006; Pescosolido et al. 2015), relationships between beliefs and stigma (Littlewood, 1998; Kvaale, Goffdiener, and Haslam, 2013), role of contact in alleviating stigma (Thornicroft, Mehta, Clement, Evans-Lacko, et al., 2016), and the effect of stigma on help-seeking (Mascayano, Armijo, and Yang, 2015) are examples. For this reason, I think it is desirable when addressing related issues to consider the possibility of patterning along development lines.

A description of how countries were allocated to the developed or developing group is given in Appendix C.

Overview of Dissertation

Chapter 2 considers the relationships between particular beliefs about mental illness and stigmatization. One focus is the claim that biogenetic etiological beliefs are associated with less severe stigmatization. Despite a large amount work in this area, there are a variety of outstanding issues with this claim. For example, there has been almost no investigation of how a set of beliefs about schizophrenia might function differently in different social and cultural contexts. Can we assume that the beliefs that seems to lead to less stigma in one context will unproblematically do so in another? It is possible to investigate this with a multi-national dataset that includes developing countries. More fundamentally, the theoretical understanding linking particular beliefs to blaming to stigma has been directly evaluated only occasionally. Is it really the case the biogenetic beliefs are

associated with less blame than other beliefs? Is it really the case that blaming is associated with more intense stigma? In this chapter, I address the evidence for each component of the logical chain and evaluate the strength of blaming (and later, prognostic pessimism) as a mediator between etiological beliefs and stigma.

Chapter 3 considers the the extent to which individual-level characteristics and beliefs can explain country-level variation in stigmatization. Is the reason why the average Bangladeshi expresses so much more intense stigma regarding the person with schizophrenia than the average German really because Bangladeshis are less likely to have a medical view on the causes of schizophrenia? Or because they have on average less education? Or because they tend to have a more pessimistic attitude about recovery? How much can differences in the characteristics of the average individual in each country explain in the end? One reason why these questions are important is because they put into context the value of pursuing mental health education as a method to reduce stigmatization globally. To the extent that these differences can explain a great deal of the country-level differences, they are valuable. If they explain little, the value to stigma reduction of aggressively exporting medical "knowledge" about mental illness to the rest of the world deserves serious reconsideration.

Chapter 4 moves away from the individual-focused approach. A reiterated complaint of stigma research is that it has been treated from too much of a psychological and individualistic perspective. A strong emphasis in some quarters on stereotypes as a cause of stigma tends naturally to reinforce this predilection, as does the prominence social psychological work in both theory and application. As a general response, scholars have suggested a renewed focus on the role of social structures in the stigma process. In this chapter, I present an argument for why one feature of contemporary economies may be related to the stigmatization of people with schizophrenia. Specifically, I propose that in those countries where a large fraction of workers are dependent workers such as employees, stigmatization of people with schizophrenia will be more intense.

Conversely, in countries where it is more common to work for oneself, stigmatization will be less intense. I also assess the value of this characteristic of countries' economies in explaining why countries have different average levels of public stigma, and compare that against the explanatory value of individual characteristics and beliefs.

Chapter 2. Relating Individual-Level Characteristics to Stigma

This chapter is concerned with how individual-level characteristics relate to stigma. There are two reasons for this. The first is that, despite an extensive literature, there are still several open questions on how individuals' beliefs relate to stigma, which I explain below.

The second reason is that the main point of this dissertation is to increase our knowledge of why countries exhibit variation in average stigma scores, and one possibility is that countries' levels of public stigma differ because countries' publics differ from each other. In other words, it is possible that differences in the prevalence of micro-level characteristics can explain macro-level differences in stigma scores. The truth of this assertion is the implicit premise underlying the claim that education is a good way to reduce stigma. But at present, it is unknown whether and to what extent that is indeed the case. In order to address this gap, one must first identify which characteristics of individuals are associated with higher stigma scores. Those characteristics with significant individual-level effects and whose prevalences differ across populations are potential sources for countries' differing levels of public stigma. Once these are identified it is possible (see Chapter 3) to estimate how much of the between-country variation in stigma scores can be explained by these differences.

The existing literature on individual differences and their relationship to stigma has focused primarily on four areas: labeling, contact experience, etiologies of mental illness, and the various mechanisms that have been suggested as mediators between these and stigma. The primary mechanisms discussed in the literature are blaming and prognostic pessimism[1].

Labeling usually refers to the damage caused by the assignment of a clinical label to a person by a medically authoritative other. Since respondents are not told that the vignette person is

[1] Perceptions of dangerousness are also sometimes treated as a mechanism, but I do not consider that here for the reasons described in Chapter 1.

experiencing schizophrenia, the impact of labeling on stigma is not relevant here. Contact, discussed in Appendix A, is treated as a control in this dissertation rather than an object of study in its own right. Here I review the literature on each of the remaining areas of focus (etiologies, blaming, and prognostic pessimism) and identify the Analysis Questions for this chapter.

Literature Review and Identification of Analysis Questions

Etiologies

How the public understands mental illness generally and how it understands schizophrenia in particular (whether it is a disease, what its causes are, whether it can be cured) is seen by many as a root cause of stigma (Thornicroft, Brohan, Kassam, et al., 2008; Thornicroft, Brohan, Rose, et al., 2009; Corrigan, Morris, Michaels, et al., 2012).

The idea that replacing incorrect "myths" with correct "facts" about mental illness is important for stigma reduction is widespread. For example, Henderson and Thornicroft (2009) state "without specific knowledge of mental illness (ignorance), cultural stereotypes and myths can lead to misinformation that…could create prejudicial attitudes". Hinshaw, "given the ignorance that is still rampant" (2006, pg. x), is unsurprised at ongoing stigma and discrimination, but is hopeful that "a far brighter future can and will emerge when knowledge replaces ignorance" (pg. xvii). Similarly, "fighting stigma also requires public information campaigns to educate and inform…in order to dispel common myths and encourage more positive attitudes and behaviours" (World Health Organization, 2001). Angermeyer, Holzinger, and Matschinger (2009) note that the idea "that better knowledge leads to more favourable attitudes seems commonplace".

Education to change public beliefs about mental illness is perhaps the primary anti-stigma strategy in contemporary times (Angermeyer & Matschinger, 2005; Read, Haslam, Sayce, et al., 2006; Hinshaw, 2006; Pescosolido, Martin, Long, et al., 2010; Stuart, Arboleda-Florez, & Sartorius, 2012; Stuart, 2016). Prominent examples of education campaigns of this type include programs led by

activist organizations (e.g., National Alliance on Mental Illness (NAMI) Campaign to End Discrimination), governments (e.g., the Opening Minds campaign in Canada, the Time to Change campaign in England, the US's Substance Abuse and Mental Health Services Administration (SAMHSA) Elimination of Barriers program), and professional organizations (e.g., the World Psychiatric Association (WPA) Open the Doors program).

Often, public understandings of mental illness are presumed to be problematic if they do not align with a particular medical understanding. According to this perspective, mental illness must be seen as a bodily problem, a disease of the organ called the brain, with physically identifiable causes and medicinal/chemical solutions.

One strain of research and activism along these lines is the promotion of mental health literacy (MHL). Read, Bentall, and Fosse (2009) rather glibly characterize mental illness literacy as "the term used by biological psychiatrists for the extent to which others agree with them". Mental health literacy as originally defined (Jorm, Korten, Jacomb, et al., 1997), includes several types of knowledge. A person is considered to have a higher degree of MHL if she can identify problems as psychological distress or as signs of a specific disorder, if she has "medically correct" beliefs about causes and risk factors, if she understands what kind of (medical/psychiatric) professional help is available, if she understands what people can do for themselves, and if she knows how to obtain more information about mental illness.

A related but more tightly focused catch-phrase is "illness like any other". The idea, which has been prevalent at least since the 1960s (for two early critiques, see Farina, Allen, and Saul, 1968, and Sarbin and Mancuso, 1970), is that mental illnesses should be regarded as essentially biological in order to reduce stigma. Because people are not usually blamed for their physical makeup or genetic condition, making mental problems physical should reduce the blame attached to mental illness, and this should lead to less stigma (the perspective is explained in Corrigan, 2000; Angermeyer & Matschinger, 2005; Schomerus, Schwahn, Holzinger, et al., 2012; Stuart, Arboleda-Florez, &

Sartorius, 2012; Stuart, 2016). In short, many believe that the public should be taught to regard mental illness as biomedical in origin, and a great deal of effort has been expended to promote this idea.

There is evidence that public understandings of mental illness have indeed changed over time. Whether this change is due to these kinds of education programs, mass media portrayals of mental illness (Conrad, 2001), pharmaceutical advertising (Payton & Thoits, 2011), or other sources, members of the public in a variety of countries are increasingly likely to believe that mental illness is biogenetic (a biologically based disorder of the brain, possibly genetic) in origin (Pescosolido, Martin, Long, et al., 2010; Schomerus, Schwahn, Holzinger, et al., 2012).

Why might framing mental disorders as physical reduce the stigma attached to them? The theoretical justification for these education-focused positions often rests on social psychological attribution theory (Weiner, 1992). Attribution theory explains how people decide on who or what bears responsibility for a problem. When someone is considered responsible, they are more likely to experience punishing behaviors (shunning, rejection, aggression, etc.) than helping behaviors from others (Weiner, 1993; also see long list of empirical support in Corrigan, Markowitz, Watson, et al., 2003). The idea is that changing public perception of the cause of mental illness to something that is not associated with responsibility (e.g., genetics) will lead to more positive public attitudes, such as pity rather than anger[2].

A related idea in sociology is the exemption from obligations implied by entrance into the sick role (Parsons, 1951). In Parson's formulation, sickness is a social role with attached rights and obligations. Among these rights are exemption from the usual standards of behavior and relief from certain responsibilities. Entrance into the sick role is accompanied by "relative legitimacy".

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[2] Of course, an immediate clue that this may not be particularly useful for stigma is that, while pity may be "more positive" than anger and lead to more helping behaviors, pity is by no means an emotion unassociated with stigma (Goffman, 1963; Corrigan, Edwards, Green, et al., 2001; Corrigan, 2016).

Possibly, if people believe that schizophrenia really is a physical disease like any other, then they will not see a person with schizophrenia as deviant but instead as sick, and entitled to all of the exceptions and considerations appertaining to that state.

However, Parson also observed that the legitimacy conferred by the sick role is contingent upon the sick person fulfilling certain obligations: wanting to get well and taking action to do so. For this reason, entry into the sick role may not simply follow directly from defining the problem as biological.

People with schizophrenia often partially or completely reject the assertion that there is anything wrong with them (Lincoln, Lüllmann, & Rief, 2007), a state called "lack of insight" by clinicians. Perhaps relatedly (Lecomte, Spidel, Leclerc, et al., 2008), many people with schizophrenia do not take the medicine prescribed to them ("treatment non-adherence") (Tessier, Boyer, Husky, et al., 2017). In addition, the public sometimes believes that those with mental illnesses aren't "really trying" to behave appropriately or to control themselves (Wang & Lai, 2008; Reavley & Jorm, 2011; Valiakalayil, Paulson, & Tibbo, 2004). Many are ambivalent about whether people with mental illness are responsible for their problems, even while reiterating that they are genuinely ill (Jeffrey, 1989).

Thus, the legitimation provided by the sick role may not simply and directly follow from the belief that mental illness is a biological problem. One must also believe that people with schizophrenia are satisfying their obligations (accepting that one is ill and taking action to get better). This demand causes an interesting effect in this dataset. Of the 525 respondents who think that the vignette person's condition is unlikely or very unlikely to improve with treatment, 65% still believe that she should seek medical help (go to a doctor, consult a mental health professional, visit the hospital, and/or take prescription medication). Less than 1% of those who think improvement is not at all likely (either with treatment or on its own) believe that the vignette person should take no action.

There is a more fundamental problem with using the social psychological perspective of attribution theory or the sociological concept of the sick role to connect the biologicization of mental illnesses with decreased stigma. Both perspectives seek to free the person with mental illness from responsibility and blame. If the removal of blame is to lead to the removal of stigma, then blame must be the cause or at least a major cause of stigma. Some researchers even equate the two, or simply categorize blame as an element of stigma (e.g., Kvaale, Haslam, & Gottdiener, 2013). But, there are several reasons to believe that the relationship between stigma and blame is not so straightforward, which I review in the section on Blameworthiness below. For now, I simply note that it remains an open question whether or to what extent blame is a root cause of stigmatization.

Aside from doubts on the efficacy of blame removal as a stigma reduction strategy, there are other reasons to be concerned about the stigma effects of the biologicization of mental illness. The terms 'genetic essentialism' and 'neuro-essentialism' describe perspectives that may result from a physical interpretation of mental illness. Genetic essentialism "reduces the self to a molecular entity, equating human beings, in all their social, historical, and moral complexity, with their genes" (Nelkin & Lindee, 1995, pg. 2). Similarly, neuro-essentialism is defined as "equating subjectivity and personal identity to the brain […] the brain is used implicitly as a shortcut for more global concepts such as the person, the individual or the self" (Racine, Bar-Ilan, and Illes 2005, pg. 160). Psychological problems attributed to genes or the brain organ may be seen as innate and the result of an elemental differentness (Dar-Nimrod & Heine, 2011; Haslam 2011). As a result, a person may be seen as more deeply and fundamentally flawed than someone whose problems arise from external factors, or a combination of internal and external factors. Genetic- and neuro-essentialism may also contribute to the sense that a person's problems are untreatable (Phelan, 2005; Kvaale, Haslam, & Gottdiener, 2013). Even when strictly essentialist perspectives are not in play, "the medical model" (Guze, 1992) "can be understood as the formulation of mental disorders as natural kinds" (Haslam, 2002), which leads to othering. For these reasons, the holding of biogenetic

etiological beliefs may be expected to increase stigma because they make otherness natural, intrinsic, and inalienable.

A third possibility is that both stigma-increasing and stigma-decreasing effects of biogenetic beliefs happen simultaneously. Kvaale and Haslam (2015) have called this a "mixed blessings" model, and suggest that the existence of a positive or negative relationship between biogenetic beliefs and stigma is simply the result of one process outweighing the other.

The question of the overall effect on stigma, by whatever underlying mechanisms, of biogenetic etiological beliefs continues to be a matter of debate (Angermeyer & Dietrich, 2006; Schomerus et al. 2014). Systematic reviews of the last fifteen years have reached differing conclusions.

Read et al.'s review (2006) found that biogenetic beliefs increased negative attitudes. Jorm and Oh (2009) concluded in their review that belief in brain disease as a cause of mental illness is associated with increased social distance. Other reviews suggest that opinion is tending toward the idea that biogenetic explanations of mental illness increase stigma (Corrigan, 2016; Carter, Read, Pyle, et al., 2017; Koschorke, Evans-Lacko, Sartorius, et al., 2017).

In contrast, Reavley and Jorm (2014) find that "explaining mental disorders as due to personality characteristics (i.e., being weak-willed or "bad") is a more important factor in stigma than either biogenetic or psychosocial explanations". The Kvaale et al. review (2013) found no clear evidence to indicate that biogenetic etiological beliefs lead to increased social distance. In a meta-review of real-world education programs, which almost always define mental illness as biologically based, Corrigan et al. (2012) found that they tend to improve attitudes toward people with mental illness.

Yet others have concluded that there is no consistent effect for mental illness etiological beliefs because these effects vary according to what disorder is being considered (Angermeyer et al, 2011; Kvaale, Goffdiener, & Haslam, 2013; Schomerus, Matschinger & Angermeyer, 2014). Thus,

there remains some question as to the expected relationship between biogenetic etiological beliefs and stigma, both for schizophrenia and other illnesses.

I also note several holes in the existing literature. First, any connection between biogenetic beliefs and stigma has been primarily observed in Western industrialized countries. Angermeyer and Schomerus's review (2016) of attitude research on mental health revealed that over three-quarters of papers on attitude research originated in Europe, USA, or Australia. They find that only 0.8% of studies included data from a low income country. In their earlier review examining specifically those studies that relate biogenetic beliefs to various measures of stigma, they found only a handful of studies that focused on low- or middle-income countries (e.g., Adewuya & Makanjuola, 2008 (Nigeria); Jackson & Heatherington, 2006 (Jamaica); Peluso & Blay, 2011 (Brazil); Quinn & Knifton, 2014 (Uganda); similarly for the review by Thornicroft, G., Brohan, E., Rose, et al., 2009). Overall, research on stigma reduction from countries outside of the developed West is "conspicuous by its relative absence" (Thornicroft, Mehta, Clement, et al., 2016; see also Stuart (2016); Kvaale, Gottdiener, & Haslam, 2013; White, Ramachandran, & Kumar, 2017).

In addition to the shortage of information about effects in developing countries, there is the question of comparisons. Some studies have focused on within-country variations in stigma effects across cultural sub-groups or social positions (Yang, Purdie-Vaughn, Kotabe, et al., 2013; Ling, Watanabe, Yoshii, et al., 2014), but cross-country quantitative comparisons are rare. There have as yet been few studies (Olafsdottir & Pescosolido, 2011; Angermeyer, Buyantugs, Kenzine, et al., 2004 are exceptions) in which the same instruments and methodology are deployed to representative samples from multiple countries so that like may be compared to like (Angermeyer & Deitrich, 2006). This is especially the case for comparisons between Western and non-Western countries (Angermeyer & Schomerus, 2016).

However, most studies do not address the fact that beliefs about mental illness exist in a wider social and cultural space which can give a particular belief different meaning content than in

another space, and as a result have a different relationship with stigma. While it is well-known that beliefs about mental illnesses, including their causes, effects, and even existence, vary dramatically from place to place, it is not known whether the stigma-related effects of these beliefs are the same in every place, or how different the effects are.

Another issue with existing work is that the majority of studies compare etiological beliefs that are biogenetic with those that are not (exceptions include Wiesjahn, Jung, Kremser, et al., 2016; Schlier, Schmick, & Lincoln, 2014; Pattyn, Verhaeghe, Sercu, et al., 2013). This approach lumps together purely biogenetic belief systems with "mixed" systems that include both biogenetic and psychosocial beliefs. One problem with this is that it assumes that biogenetic beliefs have an effect that is independent of whatever other etiological beliefs are held at the same time. In other words, research usually treats biogenetic belief as a trait with uniform effects. This reduces belief systems to simply the sum of their parts, rather than considering that the elements may interact with one another. Some of the few scholars to observe this fact speculate that this methodological problem might explain the weak connections generally found between biogenetic beliefs and stigma in correlational studies (Kvaale, Gottdiener, & Haslam, 2013).

This "biogenetic vs. not" approach also has the problem of promoting an incorrect framing of the relationship between biogenetic and psychosocial explanations as an either-or proposition. In fact, the most common outlook in every country surveyed in this dataset is a mixture of biogenetic and psychosocial etiological beliefs (see below). Following Griffiths and Christensen (2004), Jorm and Oh (2009) comment that this may mean that the observed relationships between biogenetic etiological beliefs and stigma may be driven primarily by the smaller set of people who hold exclusively biogenetic or exclusively psychosocial beliefs.

Moving away from this dichotomy also has the advantage of putting the analysis more in line with the typologies of belief that characterize other discussions. The key categories that have dominated the debate about how to understand the origins of mental illness are biomedical (also

called "the medical model" or the bio-bio-bio model), biopsychosocial, and psychological/ psychosocial (Read, Bentall, & Fosse, 2009).

The "biogenetic vs. not" approach lumps together biomedical and biopsychosocial models into the "biogenetic belief is present" category. The result is that most analyses skip a comparison of the effects of the two medically, and in many countries socially, dominant models, biomedical and biopsychosocial, while simultaneously ignoring any stigma-relevant differences that might exist between psychosocial and other models[3].

Some researchers who believe that biogenetic beliefs increase stigma, have asked whether a more "balanced" educational program, one that promotes both biological and psychosocial mechanisms, would be effective in lessening stigma (Corrigan & Watson, 2004; Lincoln, Arens, Berger, et al., 2008). This belief is partially based on findings which suggest that psychosocial beliefs have a negative relationship with stigma (see Read, Haslam, Sayce, et al., 2006 for a selection). While this conclusion is intuitively appealing, there has been very little direct investigation.

The few studies to address this question have yielded a few suggestive, but contradictory, results. In an experimental study in New Zealand (Walker & Read, 2002) examining changes in stigma before and after an education program presenting both biological and psychosocial causes found no statistically significant change in stigma among participants. Similarly, Schlier, Schmick, and Lincoln (2014) in an experimental study among Germans found that a mixed model education course did not reduce stigma more effectively than did an exclusively biogenetic or exclusively psychosocial course.

On the other hand, a multitude of population-change studies, mostly in Western countries, have found that, over time, public endorsement of biological explanations have increased, but psychosocial explanations have not decreased, and that during this same period, stigma has increased

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[3] Three percent of respondents did not agree with any of the biological or psychosocial explanations provided by the survey.

(see Angermeyer and Dietrich, 2006 and Schomerus et al., 2012 for reviews). If it were the case that getting people to believe in both biological and psychosocial causes would reduce stigma, such an outcome would be unlikely.

Thus, the question of a biopsychosocial etiology's relationship to stigma remains largely open. By treating biopsychosocial models as more than just a combination of biomedical and psychosocial models, but instead as a distinct etiological belief, it is possible to investigate the question directly here.

Based on these considerations, the following questions are considered.

Analysis Question 1: How do etiological beliefs relate to stigma?

1.1: What is the overall relationship between biogenetic beliefs and stigma?

1.2: How similar or different are biomedical and biopsychosocial models in their stigma effects?

1.3: Are belief effects consistent? Do explanatory models of mental illness have the same stigma effects regardless of country context?

Blameworthiness

As described earlier, the "illness like any other" perspective predicts that biogenetic etiological beliefs decrease stigma by reducing the sense that the stigmatized person is to blame for their problem. The implicit claim is that mental illness stigma is (more or less) caused by this sense of blameworthiness, and hence that if blame is removed then stigma will be as well.

However, there are both theoretical and evidential reasons to question this line of reasoning.

Meta-analyses have reached differing conclusions as to whether biogenetic etiological beliefs in fact reduce blaming in the case of mental illness. While some studies seem to show that biogenetic beliefs are associated with less blame for a variety of illnesses (Kvaale, Haslam, & Gottdiener 2013 provides a meta-analysis), others suggest that biogenetic beliefs do not reduce

blame (see Loughman and Haslam 2018 for a meta-analysis and also Angermeyer, Holzinger, Carta, and Schomerus 2011).

In addition, it is not clear that removing blame removes or reduces stigma. Scambler (2009) observes that blame is more associated with deviance than stigma, and that deviance and stigma are not the same thing. The former is a "moral deficit" and the latter an "ontological deficit", and further "shame can be attributed in the absence of blame and blame in the absence of shame" (Scambler and Paoli 2008, pg. 1850). Goffman gives many examples where pity without blame is the main response: "That poor, poor girl [who had lost one of her legs]" (p. 16) and "How do you do, poor boy [person with dwarfism]" (p. 137) are typical. Thus, there is reason to expect only a loose connection between blame reduction and stigma reduction.

Another question concerns the importance of blaming to mental illness in the first place. While traditionally, and by Goffman himself, mental illnesses have been placed in the "blemishes of individual character" category[4], that may not be how mental illnesses are perceived in the present day. Existing evidence suggests that blameworthiness and responsibility are not commonly attributed to schizophrenia sufferers, at least in some countries (Schomerus, Matschinger, & Angermeyer 2006; Angermeyer et al. 2011; Wood, Birtel, Alsawy, Pyle, & Morrison 2014).

In short, blame and stigma have only a loose theoretical connection, and existing evidence suggests that there may be little connection between them in the particular case of schizophrenia. The removal of blame seems likely to have its own positive effects on people's lives (Reisenzein, 1986; Rush, 1998; Corrigan, River, Lundin, et al., 2000), but if, how, and how much that removal affects the stigmatization of people with schizophrenia is not well-understood. Therefore, this chapter considers the following.

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[4] His three types of stigma are "abominations of the body", "blemishes of individual character", and "the tribal stigma of race, nation, and religion" (1963, p. 4). This second category is the one most typically associated with blaming.

Analysis Question 2: What are the relationships among biogenetic beliefs, blaming, and stigmatization?

2.1: Is blame an important component of the stigmatization of schizophrenia (i.e., do blamers exhibit more stigmatization of V than non-blamers)?

2.2: Which etiological beliefs are associated with the least likelihood of blaming? Especially, are those holding biogenetic etiological beliefs less likely to blame V than are others?

2.3: How consistent are the relationships among biogenetic beliefs, blaming, and stigmatization?

2.4: To what extent does blame mediate between biogenetic beliefs and stigma?

Prognostic Pessimism

Prognostic pessimism, the belief that an illness is chronic and unlikely to resolve, has been posited (Phelan 2005, Kvaale, Haslam, & Gottdiener, 2013) as a mechanism by which biogenetic etiological beliefs increase stigmatization of people with schizophrenia. The essentialist argument described earlier suggests that biogenetic beliefs create the perception that mental disorders are innate, and therefore difficult if not impossible to change. In turn, prognostic pessimism increases the desire for social distance, possibly because the costs of interaction are seen as never-ending (Norman, Windell, & Manchanda, 2010).

Meta-analytic reviews (Kvaale, Gottdiener, & Haslam, 2013; Loughman and Haslam, 2018) have found that biogenetic beliefs are associated with increased prognostic pessimism, and other studies (Lebowitz & Ahn, 2012; Kvaale & Haslam, 2015; Schomerus, Matschinger, & Angermeyer, 2014) that prognostic pessimism is associated with increased stigmatization.

Taken together, these suggest that prognostic pessimism is a mechanism by which biogenetic beliefs lead to higher levels of stigmatization. However, I am only aware of one study (Schomerus,

Matschinger, & Angermeyer, 2014, in Germany) that has explicitly addressed the entire logical path (biogenetic beliefs -> prognostic pessimism -> stigma). Contrary to expectations, Schomerus et al. found that prognostic pessimism did not mediate between biogenetic beliefs and stigma.

There is another question which has received almost no attention, and that is the question of level of impact. Prognostic pessimism is extremely common among mental health professionals. The traditional clinical perception of schizophrenia is that it is "a neurodegenerative chronic condition with a very pessimistic outlook" (Brassan, Grohs, Matos, and Shergill, 2018, pg. 1), or even "chronic, deteriorating, and more or less incurable" (Cohen and Cohen, 1984, pg. 1178). But this lack of optimism is not found among the general public. Using data from the 2006 General Social Survey, Schnittker (2008) finds that 98% of Americans believe schizophrenia can improve with treatment (up from 94% in 1996). Looking beyond the US, the data from this study shows that most countries' publics tended to show high agreement with the statement that V's problems are likely to improve with treatment (Table 2.18 below). There is even a non-trivial fraction in most countries who believe that V's problem is likely to improve on its own. Given the generally low levels of prognostic pessimism in the general public, the role of prognostic pessimism in creating stigma may well be small, but whether or not this is the case remains largely unstudied.

It is also the case that the relationship between biogenetic beliefs and prognostic pessimism, as well as that between prognostic pessimism and stigmatization have primarily been studied in developed countries. For example, of all the reference studies from the two systematic meta-analyses described earlier, only one involved a country (Jamaica) other than Germany, Australia, or the United States.

These considerations prompt the following.

Analysis Question 3: What is the role of prognostic pessimism in stigmatization?

3.1: Is prognostic pessimism an important component of the stigmatization of schizophrenia (i.e., how large is the difference in stigmatization between pessimistic and non-pessimistic responders)?

3.2: Does prognostic pessimism mediate between biogenetic etiological beliefs and stigma, and is that mediation large enough to be meaningful?

3.3: How consistent are these answers from place to place?

Measures and Methods

In the literature review, I defined three Analysis Questions and ten associated subquestions. Each of the Analysis Questions is addressed in a separate Analysis Section below: Etiologies, Blameworthiness, and Prognostic Pessimism. Here I give the measures for variables that have not already been described, and also discuss the methods of analysis. Descriptive statistics are given and discussed in the appropriate Analysis Section.

Measures - Etiologies

After reading the vignette, respondents were asked a variety of questions about the cause of V's problems, with each potential cause considered separately: brain disease/disorder, genetics, stress, the way V was raised, bad character, God's will, and bad luck. For each question, the available responses formed a 4-point Likert scale: very likely, somewhat likely, not very likely, not at all likely to be a cause.

In the literature, genetics and brain disease are often grouped together into "biogenetic etiology" because they both root mental illness in a person's physical nature. Therefore, a respondent is considered to have espoused a biogenetic explanatory model if she believes that a cause of V's problem is very likely or somewhat likely a brain disease, and/or if she believes that the

cause of V's problem is very likely or somewhat likely genetic. If neither of these is the case, then she is considered to have a non-biogenetic explanatory model.

As noted earlier, the "biogenetic vs. not" dichotomy is problematic. Therefore, I use another categorization of explanatory models as well: biomedical, biopsychosocial, psychological/ psychosocial, and none of these. Biomedical (B) believers are those respondents who marked at least one biogenetic cause as (very or somewhat) likely but did not mark either of the psychosocial causes as likely. Biopsychosocial (BP) believers marked at least one biogenetic cause and at least one psychosocial cause as likely. Psychosocial (P) believers marked at least one psychosocial cause as likely but neither of the biogenetic causes as likely. Respondents who did not mark any of the biogenetic or psychosocial causes as likely were considered to have unrepresented etiological beliefs ("none of these", nBP). Respondents who were missing a response for every question were considered to be missing etiological data. Table 2.1 shows the definitions.

Table 2.1. Classification of Etiological Beliefs

	Cause is:					
Explanatory Model	Brain disease/ disorder	Genetic	Stress	Way V was Raised	God's Will	Bad Luck
Biomedical (B)	at least one		neither		any or none	
Biopsychosocial (BP)	at least one		at least one		any or none	
Psychosocial (P)	neither		at least one		any or none	
None of these (nBP)	neither		neither		any or none	

Measures - Blameworthiness

R's perception of V's blameworthiness was not measured directly in this dataset. Instead, I use two related measures to get at the idea of blaming. The first measure is whether the respondent has sympathy for people with mental health problems[5], answered on a 4-point Likert scale. "Quite a

[5] Note that the question was not about the vignette person (whom the respondent may or may not consider to have a mental health problem), but about people in general with mental health problems. That may imply that R's response is only applicable to V among those respondents who agree that V is experiencing a mental illness (mental illness labelers). The results for the subset of the population who are mental illness labelers is considered separately in the analyses.

bit" or "a great deal" of sympathy likely implies lack of blame: one does not sympathize much with the guilty party. The second measure is whether the respondent believes that bad character is "likely" or "very likely" a cause of the vignette person's problems. People who choose this are making V morally responsible for those problems, implying that they blame her. I have also combined these into a single measure of overall blame: if a respondent either has little to no sympathy with V or if she thinks V's problems are at least partially due to bad character, then I consider that R blames V.

Measures - Prognostic Pessimism

In this survey, questions about two kinds of prognostic pessimism questions were fielded: R's sense of the likelihood that V's problem will improve with treatment, and of the likelihood that V's problem will improve on its own (without treatment)[6]. Answers to both questions were chosen from a 4-point Likert scale: very likely, somewhat likely, not very likely, not at all likely. Respondents who indicated that improvement with treatment was not very likely or not at all likely are considered to be exhibiting treatment pessimism. Those who indicated that V's problems were not very likely or not at all likely to improve on their own are considered to be exhibiting on-own pessimism. Overall prognostic pessimism is as a combination of these: if a respondent exhibits both treatment pessimism and on-own pessimism, then that person is considered to exhibiting overall prognostic pessimism.

Methods

The ten analysis subquestions fall into three categories, shown in Table 2.2. The first type is concerned with the typical effect of a given individual-level characteristic: on the whole, is individual characteristic X associated with higher, lower, or similar individual stigma scores? The second type

[6] Whether respondents believe that V can be cured was not asked in this survey.

is concerned with contextual variation: how much does the typical effect of an individual's characteristic on their stigma score vary from place to place? The third category of question is concerned with mediation: is a given characteristic a mechanism by which some other affects stigma score?

Table 2.2. Analysis Sub-Questions Categorization

Category	Sub-Question Number	Sub-Question Description
Typical Effect	1.1	What is the relationship between biogenetic beliefs and stigma?
	1.2	How similar or different are biomedical and bio psychosocial models in their stigma effects?
	2.1	Is blame an important component of the stigmatization of schizophrenia?
	2.2	Which etiological beliefs are associated with the least likelihood of blaming? Especially, are those holding biogenetic etiological beliefs less likely to blame V than are others?
	3.1	Is prognostic pessimism as important component of the stigmatization of schizophrenia?
Contextual Variation	1.3	Are belief effects on stigma consistent from place to place?
	2.3	How consistent are the relationships among biogenetic beliefs, blaming, and stigmatization?
	3.3	How consistent is the role of prognostic pessimism in stigmatization?
Mediation	2.4	To what extent does blame mediate between biogenetic beliefs and stigma?
	3.2	Does prognostic pessimism mediate between biogenetic etiological beliefs and stigma, and is that mediation large enough to be meaningful?

The main method of analysis for all three categories is mixed effects multi-level modeling, described in Chapter 1, but with different elements taking primacy depending on the type of question. For all of the models used, I control for age, gender, race/ethnicity, and education of the respondent, gender and race/ethnicity of the vignette person, and the respondent's contact experience as described in Chapter 1. Here I explain how I use mixed effects models to address each category of question.

"Typical" Effect Questions

The fixed effect in a mixed effects model is the typical effect in that it is the expected value, and can be interpreted similarly to a standard linear regression coefficient. However, unlike a

standard regression coefficient, the value also accounts for the fact that respondents are clustered into countries.

Like a standard regression model, a mixed effects model allows for the presence of random differences between respondents in the relationship by the presence of an error term, whereas in the mixed effects case, this error comes from the fact that respondents are from different countries and also because people within countries differ from each other. In order to cleanly separate the between-country and within-country effects and errors, all individual-level predictor variables have been group-mean centered[7]. Therefore, the interpretation of fixed effect coefficients in the models below is as the expected effect of the predictor on the outcome within a given country.

Contextual Variation Questions

To assess how consistent a given effect is across contexts, I take two approaches. First, to detect and quantify the degree of variation across countries, I estimate the random effects in the mixed effects models. Second, to detect whether any cross-country variation found is patterned by development status, I include an interaction between country development status and the individual-level variable of interest.

The random effects in the mixed effects model are the estimate of variation in the size of the fixed effect from country to country. Thus, when the value is large compared to the fixed effect point estimate, it suggests that the effect of the variable of interest is not very consistent from country to country. I give each random effect as a standard deviation rather than as a variation in the charts below, so that one can use its value to quantify the expected range of values of the effect as one moves from country to country. The fixed effect plus or minus 1.96 times the standard-

[7] If individual-level variables are not group-mean centered, then the coefficient is a difficult-to-interpret mixture of within- and between-country effects. More details can be found in Rabe-Hesketh and Skrondal (2008, pg. 109). Country-level variables (in this chapter, only development status) are grand-mean centered.

deviation representation of the random effect is the spread of values needed to encapsulate the expected value of the coefficient in approximately 95% of the entire population of countries, of which one only has access only to a partial sample (Rabe-Hesketh and Skrondal, 2008, pg. 159)[8].

Interactions terms with country development status complement information from the random effect. These interaction terms are cross-level effects, since they are an interaction between an individual-level variable (e.g., etiological belief) and a country-level variable (development status). As such, they are interpretable in two ways. First, the size and significance of the fixed-effect interaction term tell one if there a meaningful difference in the fixed effect between developed and developing countries. Again, this is similar to how the interaction term in a standard linear regression model is interpreted.

Second, when the interaction term is added to the model, it can sometimes cause the size of the random effect for the individual-level variable to change. If the extent to which development status decreases the size of the random effect is large, then this suggests that the effect of a given individual-level variable is very similar across countries of a given development type, but not across development types. In this case, development status explains much of the cross-country variation, and one can say that the difference in the effect is patterned along development status lines.

Thus, I characterize contextual variation by identifying how similar countries are in how one variable is related to another within each country (random effect), how different development contexts are in terms of this relationship (cross-level effect), and the extent to which cross-country variation is actually development status variation (change in random effect).

[8] As noted in Chapter 1, if the countries surveyed here are not a true representative random sample of the population of countries, then the cross-country variation may not be representative either. Future studies would ideally include larger and more representative samples of countries.

Mediation Questions

Under standard regression, an estimate for the extent to which one variable explains the effect of another on a third (e.g., X —> M —> Y) can be obtained by comparing the coefficient for X in a model with Y as the output with (called c') and without (c) controlling for M. Because the total effect is equal to the direct effect plus the indirect effect (usually written as c = c' + ab), the point estimate for the extent of mediation by M is simply (c-c')/c. Additionally, paths from X —> M (called a) and X —> Y (called b) should be significant and consistent in direction (Baron and Kenney, 1986; MacKinnon, Warsi, & Dwyer, 1995).

Computing the standard error for the indirect effect is usually done (Hayes and Scharkow, 2013) with Sobel's formula (1982) or bootstrapping. Unlike the Sobel test, bootstrapping does not make any assumptions regarding correlation between a and b or normality of the distribution of ab (MacKinnon, Lockwood, and Williams, 2010)[9] and so is preferred in most contexts. Using the variation estimate, one can compute a p-value for a test of the null hypothesis that the indirect effect is equal to zero (e.g., mediation has occurred).

Unfortunately, with multi-level modeling, it becomes rather complicated to compute the standard error. The problem with bootstrapping in the multi-level context is the resampling method, since observations are not independent (Ren, Lai, Tong, Aminzadeh, Hou, & Lai, 2010). For the Sobel test, the analogous multi-level formula includes a term for the population covariance of a and b, which requires simultaneous estimation of both to obtain (Kenny, Korchmaros, & Bolger, 2003).

In this context, I am less concerned with excluding the possibility that mediation is not present. This is of course not the only purpose of the standard error estimate, but it is the most common usage of it in a mediation context. In fact, it would be very surprising if there were

[9] However, bootstrapping has its own problems, such as excessive Type I errors (false positives) for bias-corrected bootstrapping and low power for non-bias corrected bootstrapping (see Fritz, Taylor, and MacKinnon, 2012).

actually no mediation regarding either blaming or prognostic pessimism, and I do not make that claim here. Instead, I focus on the estimate for the indirect effect, in its role as the best estimate given the data.

Unfortunately, this also presents some difficulty in the multi-level context. The ab covariance term is also present in the multi-level analogue to the c=c'+ab formula: $c=c'+ab+\sigma_{ab}$ (Kenny, Korchmaros, & Bolger, 2003). If the covariance term (σ_{ab}) is large and positive, it could cause an understatement of the indirect effect. A large and positive covariance term would imply, for example, that people for whom biogenetic beliefs more naturally lead to blaming are also people for whom blaming has a more intense effect on stigma. There is little reason to believe that this is the case, whether blaming or prognostic pessimism is the mediator under consideration.

Therefore, the approach taken here is to estimate the indirect effect and resulting extent of the mediation in a manner analogous to that used with standard regression models. The fixed effect from a model that includes the proposed mediator is compared to the fixed effect from a model that does not. Both models control for the usual potential confounders (respondent age, gender, race, education, and contact experience, and vignette person's race and gender).

Analysis — Etiological Beliefs

The goal of this section is to consider how etiological beliefs relate to stigma. Specifically, I identify the overall relationship between biogenetic beliefs and stigma (Question 1.1), how similar or different biomedical and biopsychosocial models are in their stigma effects (Question 1.2), and the consistency in belief effects across countries (Question 1.3).

Table 2.3 shows the proportion in each country who hold biogenetic etiological beliefs. They constitute the majority in every country surveyed.

Interestingly, there is not a particularly dramatic difference in the likelihood of holding biogenetic beliefs between developing and developed countries (Table 2.4), either for the whole

population or among mental illness labelers only. The mean prevalence of biogenetic belief in the populations of the developing countries surveyed here (76%) is only 4 percentage points lower than that of the developed countries surveyed (80%). A χ^2 test of the hypothesis that developing countries have a different mean prevalence level than developed countries has a p-value of 0.5161, suggesting that there may in fact be no difference between them. Differences are even lower when only mental illness labelers are considered.

Table 2.3. Proportion Agreeing Cause is Partially or Wholly Biogenetic, by Country and Labeling

	Mental Illness Labelers Only		All Respondents	
Country	Count	%	Count	%
South Korea	170	64	198	58
China	923	67	1162	65
Germany	272	72	292	67
Hungary	250	73	279	70
Brazil	230	77	320	65
Belgium	246	84	302	88
Bulgaria	238	86	270	82
South Africa	297	87	387	74
Bangladesh	422	88	432	87
Cyprus	226	88	233	87
New Zealand	254	88	283	83
Spain	284	88	320	78
Great Britain	286	90	300	88
Argentina	246	91	332	71
Philippines	308	93	348	86
Iceland	273	95	298	90
USA	417	95	432	93

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

Counts are raw counts of respondents. Percentages have been weighted to population level using weights provided by SGC-MHS.

Table 2.4. Descriptive Statistics for Country-Specific Percentages of Biogenetic Believers by Country Development Status

	Mean	Standard deviation	Min	Max
All Respondents				
Developed Countries	80	12	58	93
Developing Countries	76	9	65	87
All Countries	78	11	58	93
Mental Illness Labelers Only				
Developed Countries	84	10	64	95
Developing Countries	84	9	67	93
All Countries	84	10	64	95

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

Weighted to population level using weights provided by SGC-MHS; statistics given are based on an equal weighting of each country

Somewhat anticipating later discussion, I note here that the small difference between developing and developed countries reflects a stronger preference for exclusively psychosocial beliefs in the former and for exclusively biogenetic beliefs in the latter. The proportion holding biopsychosocial beliefs is very similar across development contexts.

Biogenetic Beliefs and Stigma

Question 1.1 asks, "What is the relationship between biogenetic beliefs and stigma?". Are biogenetic etiological beliefs associated with less stigma against people with schizophrenia as the education/blame reduction arguments suggest, or with more stigma as the essentialist arguments suggests?

To answer this question, Table 2.5 shows mixed effects models that relate biogenetic etiological beliefs to stigma scores. In these models, I have limited the population to those who believe that V is experiencing a mental illness[10]. All models control for sociodemographic characteristics of V and R as well as R's contact experience (not shown).

Model 1 shows biogenetic belief effects alone, after accounting for sociodemographic and contact experience. Model 2 introduces an independent effect for psychosocial beliefs. This is done to give psychosocial beliefs the same treatment as the biogenetic beliefs which have so dominated the literature (generally psychosocial beliefs are simply treated as the base case against which biogenetic beliefs are compared), and also so they can function as controls to elicit a more accurate estimate for the biogenetic beliefs coefficient. This is especially important given the fact that biogenetic beliefs are generally not held in isolation: in this sample, 89% of respondents who believe

[10] The effect of biogenetic beliefs is very similar whether this restriction is made or not. The difference comes in with respect to psychosocial beliefs. If this limitation is not done, then one finds that the effect for psychosocial etiological beliefs is positive in several countries. This is sensible because the base case in this instance would include those who do not think that V is experiencing a problem that needs to be explained, either psychosocially or biogenetically. Nine percent of respondents believe that V is only experiencing normal ups and downs.

that V's mental illness has at least one biological cause believe that it has at least one psychosocial cause as well. Model 3 explains some of the variation in belief effects by differentiating between developed and developing countries.

Table 2.5. Mixed Models of Overall Stigma Scores Among Mental Illness Labelers By Etiological Beliefs Held (Biogenetic, Psychosocial)

Overall Stigma Score (0-100)	Biogenetic Beliefs (1)	+ Psychosocial (2)	+ Development (3)
Intercept	50.0*** (2.4)	49.9*** (2.4)	49.9*** (2.4)
Fixed Effects†			
Etiological Beliefs			
Biogenetic beliefs held (vs. not)	8.0*** (1.4)	8.0*** (1.4)	8.0*** (1.4)
Psychosocial beliefs held (vs. not)		-5.5*** (1.8)	-4.9*** (1.2)
Interactions			
Biogenetic x Development			-2.0 (2.5)
Psychosocial x Development			-7.1** (2.7)
Country Characteristics			
Development Status			-2.8 (5.6)
Random Effects *(given as std. dev.)*			
Etiological Beliefs			
Biogenetic beliefs held	4.0	4.1	4.0
Psychosocial beliefs held		4.5	2.2
Residual Variation			
Within-country variation	545.1	539.6	539.9
Between-country variation	117.5	117.3	115.7
Observations	6,219	6,198	6,198
Countries	17	17	17

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
All models control for sociodemographic and contact variables. See Chapter 1.
Standard errors shown in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Three points are apparent about biogenetic etiological beliefs from these models. First, biogenetic believers tend to have higher stigma scores than otherwise similar people in their own country (Model 1). On average, this relationship is statistically significant and fairly large (β=8.0, p-value: 0.000).

Second, on a point which has been little studied previously and which speaks to Question 1.3 ("Are belief effects consistent from place to place?"), the size of the relationship varies rather

dramatically from country to country as shown by the random effect for biogenetic beliefs (4.0). The size of the random effect indicates that if the entire population of countries were surveyed, 95% of them would exhibit biogenetic belief coefficients between ~0.2 and ~16 points (8.0 +- 1.96*4.0)[11]. Thus, in some countries, one can expect the effect to be trivially small, and in others for it to be quite large.

However, the fact that the interaction with development status (Model 3) is not significant indicates that these differences are not patterned along development lines. So, third, despite concerns to the contrary, an increase in studies in developing countries is unlikely to change the perspective on how a disease framing relates to mental illness stigmatization: it seems to be associated with higher stigma scores practically everywhere.

The existence of an independent effect of psychosocial beliefs after controlling for biogenetic beliefs (β = -5.5, p-value = 0.007) underscores the need to consider psychosocial beliefs as beliefs that have their own effect on stigma, rather than simply as the "not" part of "biogenetic vs. not". This result challenges the claim that "only causal biological attributions are likely to have a distinct influence on public attitudes and recommendations" (Olafsdottir and Pescosolido, 2011, p. 931). Respondents who attribute V's mental illness to stress, the way she was raised, or a combination of both (possibly in addition to other causes) tend to have lower stigma scores than otherwise similar people who do not.

Unlike for biogenetic beliefs, there is a difference between developed and developing countries in the coefficient for psychosocial beliefs. The overall result from Model 2 disguises significant inter-country variation, which is largely explained by differentiating between developing and developed countries, as shown by the fact that the estimated size of the random effect for psychosocial beliefs drops from 4.5 (Model 2) to 2.2 (Model 3) when countries are separated by

[11] As previously pointed out, this interpretation depends on the assumption that this sample is representative of the population. However, even if this is not the case and the sample contains distorting outliers, it is nonetheless true that there is significant variation among these countries.

development status, which is a 76% drop (1- (2.2^2/4.5^2)) in cross-country variation in the coefficient. The development interaction term shows that the protective effect of psychosocial beliefs is 7.1 points larger in developed countries than in developing ones.

Biomedical vs. Biopsychosocial Beliefs

The fraction of mental illness labelers holding each belief type is shown in Table 2.6 and the country-specific distributions are shown in Figure 2.1.

Table 2.6. Country Mean Prevalence of Etiological Belief Types Among Mental Illness Labelers, by Development Status

	Developing		Developed		Total	
Etiological Belief Type	Count	%	Count	%	Count	%
Biomedical (B)	161	5%	368	11%	529	9%
Biopsychosocial (BP)	2,494	79%	2,297	73%	4,791	75%
Psychosocial (P)	650	14%	432	14%	1,082	14%
None of these (nBP)	58	2%	63	2%	121	2%
Total	3,363		3,160		6,523	

Source: Stigma in Global Context - Mental Health Survey (SGC-M

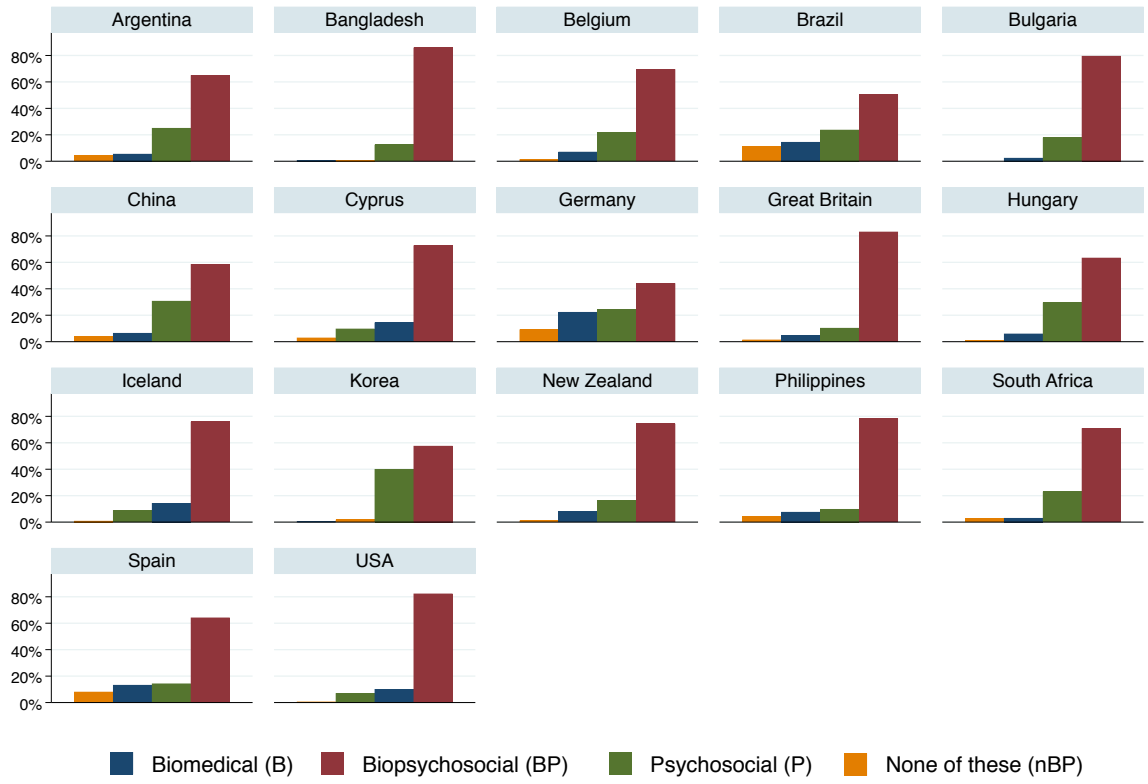
Counts are raw counts of respondents. Percentages have been weighted to population level using weights provided by SGC-MHS, adjusted to give equal representation to each country.

In both developed and developing countries, most mental illness labelers attribute V's mental illness to both biological and psychosocial causes (BP). The main difference between developed and developing contexts is that mental illness labelers in developed countries are more likely to hold biomedical (B) beliefs than labelers in developing countries. Otherwise, they are quite similar in their belief distributions, and a Pearson χ^2 test suggests that the distributions may be the same (p-value: 0.2783).

This section addresses Question 1.2 ("How similar or different are biomedical and biopsychosocial models in their stigma effects?"). As in the previous section and for the same reason, the sample has been limited to those who believe that V is experiencing a mental illness.

Table 2.7 shows the relevant models. The stigma scores of biomedical (B), psychosocial (P), and "none of these" (nPB) believers are contrasted with those of otherwise similar biopsychosocial (BP) believers in their own countries. As before, respondent characteristics, respondent contact experience, and vignette person characteristics are controlled for but not shown.

Figure 2.1. Distribution of Explanatory Models, by Country



Model 1 shows the overall results, and Model 2 separates results by country development status. The large and statistically significant interaction term for B vs. BP shows that there is significant difference between developed and developing countries in how etiological beliefs affect stigma scores.

In developing countries, B and BP believers tend to have very similar stigma scores (β=-2.1, p-value: 0.493). However, in developed countries, the expected stigma effects of biomedical and biopsychosocial etiologies are quite different: attributing the cause of V's mental illness exclusively to

biological causes is associated with stigma scores that are on average 8.6 points (p-value: 0.000) higher than those associated with attributing the cause to both biological and psychosocial factors.

When all countries are considered together, there is significant variation from country to country in the B vs. BP coefficient, as shown by the size of the random effect in Model 1. However, within a given development context, there is very little variation between countries. The change in the random effect when an interaction with development status is added (Model 2 versus Model 1) shows that almost 80% of the between-country variation in the relationship between B and BP beliefs is explained by development context (1- (2.7^2/5.9^2)).

Table 2.7. Mixed Models of Overall Stigma Scores Among Mental Illness Labelers by Etiological Belief Type (B, BP, P, nBP†)

Overall Stigma Score (0-100)	Etiological Belief Type (1)		+ Development (2)			
Intercept	49.9***	(2.4)	49.9***	(2.4)		
Fixed Effects††						
Etiological Belief Type			*Developing*		*Developed*	
B vs. BP	5.3**	(2.1)	-2.1	(3.1)	8.6***	(1.6)
P vs. BP	-8.4***	(1.5)	-10.8***	(3.5)	-6.8***	(2.3)
nBP vs. BP	-2.6	(1.9)	1.9	(2.5)	-4.5**	(1.8)
Interactions						
B vs. BP x Developed			10.8***	(3.5)		
P vs. BP x Developed			3.9	(2.6)		
nBP vs. BP x Developed			-6.4*	(3.1)		
Country Characteristics						
Development Status			-2.9	(5.6)		
Random Effects *(given as std. dev.)*						
Etiological Belief Type						
B vs. BP	5.9		2.7			
P vs. BP	4.8		4.5			
nBP vs. BP	0.0		0.0			
Residual Variation						
Within-country variation	538.1		538.0			
Between-country variation	117.7		115.7			
Observations	6,198		6,198			
Countries	17		17			

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

† Etiological Type abbreviations:

B: biomedical (biogenetic beliefs, no psychosocial beliefs)

BP: biopsychosocial (biogenetic and psychosocial beliefs)

P: psychosocial (psychosocial beliefs, no biogenetic beliefs)

nBP: none of these (no biogenetic beliefs, no psychosocial beliefs)

All models control for sociodemographic and contact variables. See Chapter 1.

Standard errors shown in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

Thus, in answer to Question 1.2, "How similar or different are biomedical and biopsychosocial models in their stigma effects?", the answer is that it depends on development status. In developing countries biomedical (B) and biopsychosocial (BP) beliefs are very similar in their stigma effects, but in developed countries, B beliefs are associated with significantly higher stigma scores than BP beliefs. These results are quite consistent across countries within each development context.

These models also show that P, rather than B or even BP, is the belief system associated with the lowest stigma scores. Among those who agree that what V is experiencing is a mental illness, the understanding of that mental illness as biologically based, either wholly or partially, is associated with increased stigmatization of V.

Discussion

Analysis Question 1 asked, "How do etiological beliefs relate to stigma?". The analysis found that biogenetic beliefs are consistently associated with significantly larger stigma scores among those who recognize V's problems as signs of mental illness. This is expected to be the case practically everywhere.

However, what was also observed is the importance of separating out the subcomponents of the biogenetic belief group (the B/BP distinction). In developed countries, B believers have stigma scores that are almost 9 points (on a scale of 0-100) higher than BP believers, and this differences is quite consistent across countries within the developed group. In contrast, in developing countries, the distinction between B and BP believers is not important. In a developing context, the main etiological driver of stigma differences is the presence or absence of belief in a physiological basis for V's mental illness.

While causality cannot be determined using this data, the associations found make a point that is rarely considered: the effect of a given etiological belief may differ in valence as well as

degree, according to context. For example, some have suggested that promoting a BP-based mental health education system would be effective for stigma reduction. These results suggest that that would be the case only among current B believers and only in developed countries: current P believers everywhere are likely to have increased stigma scores, while current B believers in developing countries are unlikely to experience a change. This casts significant doubt on the value of a one-size-fits-all approach to "education" on mental illness, at least as regards stigma reduction.

Overall, despite contextual variation, the associations found provide little support for claims that convincing people to believe that mental illness is a disease like any other will reduce stigma. Regardless of context, P believers tend to have the lowest stigma scores, and in developed countries, the more exclusively a respondent attributes V's problems to physiology, the higher her stigma score is likely to be. Results are more consistent with claims that biogenetic beliefs increase essentialism and cause more stigmatization of people with schizophrenia.

Analysis — Blameworthiness

The fraction of respondents who blame V is shown in Table 2.8 and the country-specific values are shown in Table 2.9.

Table 2.8. Descriptive Statistics for Country-Specific Proportions Who Blame V, Have Little or No Sympathy, or Attribute Bad Character to V

	Mean	Standard deviation	Min	Max
All Respondents				
% Blame V	50	23	6	
% Little or no sympathy	27	19	3	68
% Cause is bad character	27	16	3	59
Mental Illness Labelers Only				
% Blame V	49	23	6	85
% Little or no sympathy	26	18	3	67
% Cause is bad character	27	17	3	60

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

Weighted to population level using weights provided by SGC-MHS; statistics given are based on an equal weighting of each country

Table 2.9. Percentage of Respondents Who Blame V, by Country and Labeling

	All Respondents			Mental Illness Labelers Only		
Country	% Blame V	% Little or no sympathy	% Cause is bad character	% Blame V	% Little or no sympathy	% Cause is bad character
Iceland	6	3	3	6	3	3
Bulgaria	17	3	12	18	3	13
Bangladesh	22	9	13	21	9	13
Belgium	36	20	19	32	16	16
New Zealand	37	18	22	33	17	18
Great Britain	40	17	22	39	16	21
South Africa	45	10	33	44	12	32
USA	47	25	27	45	25	25
Cyprus	48	23	15	48	24	14
China	52	32	17	54	32	19
Spain	59	33	24	57	31	25
Argentina	60	29	40	61	25	46
Germany	63	59	9	62	59	8
Brazil	70	20	59	71	17	60
Hungary	75	48	41	76	47	43
Philippines	85	41	49	84	39	49
South Korea	86	68	47	85	67	47

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
Weighted to population level using weights provided by SGC-MHS

Countries vary widely in the fraction of respondents who blame V for her illness, either because they believe that her problems are caused by bad character, or because they have little sympathy with her for other reasons, or both. But on average, around half of a given country's population blames V, while more than a quarter of a country's population attributes V's problems to bad character and a quarter has little or no sympathy with V. These values suggest that blame remains quite widespread as a response to a person with a mental illness.

Percentages are similar when only mental illness labelers are considered. This suggests that believing that someone has a mental illness does not make people less likely to blame that person for their problems.

I also note that there is no difference between developed and developing countries in prevalence of lack of sympathy ($F(1, 16)=2.5260$, p-value: 0.1315), bad character attribution ($F(1, 16)=1.6743$, p-value: 0.2141), or overall blaming ($F(1, 16)=0.0025$, p-value: 0.9611).

Relationship between blame and stigma

Question 2.1 asks whether blame is important in the stigmatization of people with schizophrenia. It would not be at all surprising if blame is associated with higher stigma scores. The question here is not so much whether that is the case, but the degree to which it is true.

With this in mind, I take "important" to mean two things. First, at the individual level, if blaming causes an individual to greatly increase the extent to which they stigmatize a person with schizophrenia, then blame may be considered important to stigma. Naturally, "greatly" is as much a matter of interpretation as "important". But whatever one conceives of as "greatly increasing", its actuality or not cannot be assessed without quantification, which I therefore give here. Second, at the group level, blaming is important in the stigmatization of people with schizophrenia if blame seems responsible for much higher levels of public stigma than would otherwise exist. One cannot claim causality with this data, but association can still be suggestive in that if these relationships are not found, then causation is unlikely.

Let us consider the person level first: do people who blame V tend to have much higher stigma scores than otherwise similar people who do not do so? To test for this individual-level association between blaming and stigma, I use mixed effects models as before, shown in Table 2.10. Model 1 gives the relationship between blame and stigma scores, accounting for sociodemographic variables and respondent contact experience: blamers tend to have stigma scores that are 3.5 points higher (s.e.: 1.0, p-value: 0.001) than otherwise similar non-blamers from their country. Results are similar across country development statuses (Model 2), but increase slightly when other beliefs about V are controlled for (Model 3), and decrease slightly when the population is limited only to those who agree that V is experiencing a mental illness (Model 4).

To characterize the size of the point estimate, I note that the average respondent has a stigma score of 48.0 points, so a decrease of 4.3 points (point estimate from Model 3) would represent a 9% decrease in the size of their stigma score and a decrease of 3.5 (from Model 2)

would represent a 7% decrease. Since the stigma score is composed of 20 questions, this is equivalent to answering one fewer question in a stigmatizing manner 86% and 70% of the time, respectively.

Table 2.10. Mixed Models of Overall Stigma Score by Blame Response

Overall Stigma Score (0-100)	Blame (1)		+ Development (2)		+ Potential Confounders (3)		Mental Illness Labelers Only (4)	
Intercept	48.7***	(2.7)	48.7***	(2.7)	47.5***	(2.7)	49.5***	(2.5)
Fixed Effects†								
Blame (vs. no-blame)	3.6***	(1.1)	3.5***	(1.1)	4.3***	(1.0)	3.6***	(0.9)
Lack of sympathy	4.8***	(1.9)	4.5**	(1.8)	4.3***	(1.3)	4.0***	(1.2)
Bad character attribution	3.1**	(1.4)	3.1**	(1.4)	3.4***	(0.9)	2.2***	(0.7)
Interactions								
Blame x Development			2.5	(1.9)	3.9**	(1.8)	3.6*	(1.8)
Lack of sympathy x Development			5.9*	(3.3)	5.3*	(2.6)	5.5**	(2.6)
Bad character x Development			1.7	(2.4)	3.3*	(1.7)	2.9**	(1.4)
Labels								
Mental illness					5.4***	(1.1)	—	—
Schizophrenia					9.6***	(1.3)	9.3***	(1.5)
Etiological Belief Type††								
B vs. BP					3.6***	(1.1)	2.9**	(1.3)
x Development					5.5**	(2.3)	6.5**	(2.9)
P vs. BP					-4.2**	(1.6)	-5.9***	(1.6)
x Development					2.7	(2.7)	3.7	(2.7)
nBP vs. BP					-4.1*	(2.0)	-1.4	(4.6)
x Development					1.4	(3.6)	-1.4	(4.6)
Prognostic Pessimism								
Treatment pessimism					8.5***	(1.5)	8.7***	(1.6)
Improve-on-own pessimism					5.0**	(1.7)	4.8**	(1.7)
Country Characteristics								
Development Status			-1.1	(5.9)	-1.5	(6.0)	-2.1	(5.9)
Random Effects *(given as std. dev.)*								
Blame (vs. no-blame)	2.6		2.3		1.9		0.8	
Lack of sympathy	5.8		5.0		3.0		1.2	
Bad character attribution	3.7		3.6		2.0		0.0	
Residual Variation								
Within-country variation	546.5		546.5		479.3		474.7	
Between-country variation	130.3		130.1		132.8		132.2	
Observations	5,932		5,932		5,485		4,490	
Countries	17		17		17		17	

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

† All models control for sociodemographic and contact variables (not shown). See Appendix C.

†† Etiological Type abbreviations:

B: biomedical (biogenetic beliefs, no psychosocial beliefs)

BP: biopsychosocial (biogenetic and psychosocial beliefs)

P: psychosocial (psychosocial beliefs, no biogenetic beliefs)

nBP: none of these (no biogenetic beliefs, no psychosocial beliefs)

Values for lack of sympathy and bad character attribution are from independent but otherwise identical models that use each of these variables as a substitute for the blame variable.

Standard errors are shown in parentheses.

Models 3 and 4 include interaction effects between development status and etiological belief type (not shown) since these interactions were significant in previous models. Interactions between development status and labels and development status and prognostic pessimism were not significant and so have not been included.

*** p<0.01, ** p<0.05, * p<0.1

The size of the random effect suggests that if all countries were surveyed, 95% of them would show a blame effect of less than 8 points (4.3 + 1.96*1.9; Model 3), and less than 5.2 points (3.6 + 1.96*0.8; Model 4) among those characterizing V as mentally ill.

To assess group-level importance, I compute country-specific estimates for how much levels of public stigma are expected to change if blame were no longer directed against people with schizophrenia by multiplying each country's adjusted mean difference in stigma scores between blamers and non-blamers by the percentage of respondents in that country who blame V. This yields the numerical effect that blamers have on their countries' mean stigma scores. Comparing this to the actual mean stigma score for each country yields the percent change in each country's mean stigma score that is expected to result if everyone in that country no longer blamed V. Results are shown in Table 2.11.

In 70% of countries surveyed, the country-level blame effect was less than 3 points. For example, in Iceland, because such a small fraction of the population actually blames V, the large difference in stigma scores between blamers and non-blamers has an effect on the country's mean stigma score of just 1.1 points. Conversely, in Brazil, even though a large fraction of the population blames V (70%), the difference in stigma scores between blamers and non-blamers is very small, resulting in a country-level blame effect of 0.1 points.

However, there are a few countries, namely South Korea, the Philippines, and China, where blame seems to play a large role. If no one in South Korea blamed people with schizophrenia for their problems, one expects that the country's mean stigma score would be almost 9 points lower than its current value, which would represent a 17.5% reduction in the country's overall stigma score. The Philippines's average stigma score would be expected to decrease by 6.7 points or 12% from current levels, and China's to decrease by 4.1 points or nearly 10%. However, for over half of countries surveyed (10/17), successfully convincing every person in that country not to blame V (to

be sympathetic toward V and to believe that her situation is not a result of bad character) is expected to decrease current levels of public stigma by less than 5%.

Table 2.11: Country-Level Blame Effects

Country	Blame Coeff.	% Blaming	Country-Level Blame Effect	Actual Mean Stigma Score	% Change if No Blamers
Spain	-2.9	59	-1.7	48	3.5
Bangladesh	-2.8	22	-0.6	73	0.8
South Africa	0.2	45	0.1	43	-0.2
Brazil	0.2	70	0.1	41	-0.3
Germany	1.1	63	0.7	40	-1.7
Bulgaria	5.9	17	1.0	54	-1.8
Belgium	3.2	36	1.2	44	-2.6
Iceland	18.0***	6	1.1	36	-3.0
USA	3.3	47	1.6	49	-3.2
New Zealand	4.4	37	1.6	37	-4.4
Cyprus	9.3**	48	4.5	73	-6.1
Hungary	4.6	75	3.5	54	-6.4
Great Britain	6.8**	40	2.7	41	-6.8
Argentina	4.0	60	2.4	35	-6.9
China	7.8***	52	4.1	42	-9.6
Philippines	7.9**	85	6.7	55	-12.1
South Korea	10.3**	86	8.8	50	-17.5

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
Weighted to population level using weights provided by SGC-MHS
*** p<0.01, ** p<0.05, * p<0.1

Relationship Between Biogenetic Beliefs and Blame

Question 2.2 asked which etiological beliefs are associated with higher likelihood of blaming. To start, I consider whether or not biogenetic beliefs are associated with a higher likelihood of blaming. To answer this question, Table 2.12 shows logistic mixed effects models whose outcomes are the estimated ratios of the odds of blaming V between those who believe that V's problem is partially or wholly due to brain disease or genetics, and otherwise similar people from the same country who do not. Because odds ratios can be deceptively high when the outcome is common, I also give the unadjusted likelihoods and risk ratios for each country in Table 2.13.

Considering all countries together (Model 1), biogenetic believers are neither more nor less likely to blame V after accounting for sociodemographics and contact experience (OR: 0.98, s.e.: 0.16, p-value: 0.913), but Model 2 shows that there are differences by development status. The decrease in the random effect for biogenetic beliefs from Model 1 to Model 2 shows that over half of the variation in the coefficient for biogenetic beliefs (1-0.32^2/0.55^2) is due to the differences between developed and developing countries.

In developing countries, biogenetic believers are more likely to blame V (OR: 1.66, s.e.: 0.19, p-value: 0.000), and in developed countries biogenetic believers are less likely to blame V (OR: 0.67, s.e.: 0.13, p-value: 0.050). However, Model 3 shows that when only mental illness labelers are considered, the protective effect of biogenetic beliefs in developed countries becomes non-significant (OR: 0.75, s.e.: 0.13, p-value: 0.109). So, if someone thinks that V is experiencing a mental illness, attributing the origin of the mental illness to her biology does not reduce the likelihood that that person will blame V, and if they reside in a developing country, it may even increase it (OR: 1.68, s.e.: 0.31, p-value: 0.013). This does not support the claim that biogenetic beliefs about mental illness reduce likelihood of blaming.

Models 4 and 5 show that bad character attribution is the main driver for differences between biogenetic believers and others in developing countries (OR: 2.11, s.e.: 0.30, p-value: 0.000), and between developed and developing countries in this relationship (OR: 0.48, s.e.: 0.13, p-value: 0.015). Regardless of development context, biogenetic believers are just as likely as others to feel unsympathetic toward V (OR: 0.87, s.e.: 0.12, p-value: 0.340).

Relationship Between Blaming and Specific Etiological Models

I now turn to Question 2.2: which among the four etiological types considered here (B, BP, P, and nBP), which is associated with the lowest likelihood of blaming V?

Table 2.12. Estimated Odds Ratios from Logistic Mixed Effects Models of Blame, Lack of Sympathy, and Bad Character Attribution by Biogenetic Belief Status

Odds Ratios	Outcome: Blame (1)		+ Development (2)		Mental Illness Labelers Only (3)		Outcome: Lack of Sympathy (4)		Outcome: Bad Character Attribution (5)	
Intercept	1.38	(0.43)	1.38	(0.44)	1.33	(0.41)	0.44***	(0.12)	0.34***	(0.08)
Fixed Effects										
Biogenetic beliefs held (vs. not)	0.98	(0.16)					0.87	(0.12)		
Among developing countries			1.66***	(0.19)	1.68**	(0.31)			2.11***	(0.30)
Among developed countries			0.67**	(0.13)	0.75	(0.13)			1.00	(0.22)
Interaction										
x Development			0.40***	(0.09)	0.44***	(0.11)	0.73	(0.17)	0.48**	(0.13)
Country Characteristics										
Development Status			0.92	(0.42)	0.90	(0.40)	1.94	(1.04)	0.58	(0.27)
Random Effects										
Biogenetic beliefs held (vs. not)	0.55		0.32		0.27		0.37		0.40	
Residual Variation										
Between-country variation	1.32		1.32		1.27		1.15		0.83	
Observations	5,875		5,875		4,780		5,343		7,507	
Countries	17		17		17		17		17	

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
All models control for respondent and vignette person sociodemographic characteristics and respondent contact experience.
Random effects shown as unexponentiated standard deviations; residual variation also refers to the unexponentiated values.
Standard errors shown in parentheses.
*** p<0.01, ** p<0.05, * p<0.1

Table 2.13. Percentage Blaming V and Risk Ratios by Biogenetic Belief Status Among All Respondents and Mental Illness Labelers, by Country

	All Respondents				Mental Illness Labelers Only			
Country	% Blaming: Bio.	% Blaming: Non-Bio.	% Diff.	Risk Ratio	% Blaming: Bio.	% Blaming: Non-Bio.	% Diff.	Risk Ratio
Iceland	6	11	-5	0.52	11	13	-3	0.80
Great Britain	37	64	-26	0.58	64	57	7	1.13
New Zealand	32	54	-22	0.60	54	51	3	1.07
Spain	56	76	-20	0.74	76	64	12	1.19
Cyprus	46	61	-15	0.76	61	53	8	1.15
USA	46	60	-14	0.76	60	50	10	1.21
Germany	58	73	-15	0.80	73	71	1	1.02
Hungary	75	74	1	1.02	74	74	-0	0.99
South Korea	88	83	6	1.07	83	80	3	1.04
Argentina	62	54	8	1.15	54	49	5	1.10
Brazil	74	62	12	1.19	62	62	1	1.01
China	55	46	9	1.21	46	46	-0	1.00
Belgium	38	31	7	1.22	31	32	-1	0.95
Bangladesh	22	18	4	1.23	18	18	0	1.03
South Africa	48	37	11	1.30	37	35	2	1.05
Bulgaria	17	12	5	1.40	12	19	-7	0.63
Philippines	88	58	30	1.52	58	34	24	1.71
— Averages —								
All Countries	50	51	-1	0.97	51	48	4	1.08
Developing	52	41	11	1.28	41	37	4	1.09
Developed	48	59	-10	0.82	59	55	4	1.07

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
Proportions weighted to population level using weights provided by SGC-MHS
*** p<0.01, ** p<0.05, * p<0.1

Table 2.14 shows the proportion of respondents of each etiological type who blame V, by

country. Before addressing the main question, I note one point that this chart makes clear: the absolute fraction of B believers who blame V is remarkably high in many countries. In 14 of the 17 countries, more than 25% of B believers blame V (13 of 17 when only mental illness labelers are considered). Thus, even among those who have the most physical interpretation of what V is experiencing, blaming is still quite common in many countries. This is not consistent with the claim that a disease framing, even of the most exclusively physical type, naturally makes blame impossible or even particularly unlikely.

Table 2.14. Percentage Blaming V Among All Respondents and Mental Illness Labelers, by Etiological Type† and Country

	All Respondents				Mental Illness Labelers Only			
Country	B	BP	P	nBP	B	BP	P	nBP
Iceland	3	6	12	(0)	3	6	13	—
Great Britain	9	39	58	(100)	9	38	48	(100)
USA	25	48	62	(0)	25	47	53	(0)
New Zealand	31	33	51	(100)	29	30	46	(100)
Argentina	27	65	56	45	18	66	49	(49)
Spain	40	58	85	49	36	59	69	(49)
Germany	41	67	74	70	42	67	73	68
China	44	56	45	51	60	57	46	50
Hungary	65	76	73	(100)	69	76	73	(100)
Cyprus	54	44	64	(50)	62	44	55	(50)
Bulgaria	(0)	17	12	—	(0)	17	19	—
Bangladesh	(25)	22	18	(25)	(25)	22	18	(0)
Belgium	37	38	30	(50)	25	32	31	(5)
South Korea	(100)	88	83	(100)	(100)	88	79	(100)
South Africa	45	48	40	15	33	46	39	(0)
Philippines	79	89	63	45	74	89	29	(100)
Brazil	68	76	64	59	73	75	60	65

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

Cells with 5 or fewer respondents are shown in parentheses.

Cell with lowest fraction of blamers per country are shown in gray. Cells with 5 or fewer respondents were not considered in the comparison.

Weighted to population level using weights provided by SGC-MHS.

† Etiological Type abbreviations:

B: biomedical (biogenetic beliefs, no psychosocial beliefs)

BP: biopsychosocial (biogenetic and psychosocial beliefs)

P: psychosocial (psychosocial beliefs, no biogenetic beliefs)

nBP: none of these (no biogenetic beliefs, no psychosocial beliefs)

Perhaps most striking is how common it is for B believers to blame V by attributing her problems to bad character (Table 2.15). This is unexpected if one is used to contexts that resemble the US, where only 4% of B believers blame V's bad character for the problems she is experiencing (compared to 29% of BP believers and 40% of P believers). Half of countries surveyed show rates of bad character attribution of less than 10% among B believers. However, in nearly one third of countries surveyed, more than a quarter of B believers exhibit bad character attribution, and in three countries, rates exceed 50%[12].

Table 2.15. Prevalence of Bad Character Attribution and Lack of Sympathy Among Biomedical Believers (B), by Country

Country	% Cause is bad character	% Little or no sympathy
Bangladesh	(0)	(25)
Bulgaria	(0)	(0)
Iceland	2	0
Cyprus	3	52
Great Britain	3	5
USA	4	22
Germany	6	41
Belgium	7	32
China	7	36
New Zealand	12	17
Argentina	13	17
Spain	13	30
South Africa	29	3
Hungary	31	44
Philippines	54	(17)
Brazil	59	17
South Korea°	(100)	(100)

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
Cells with a denominator of less than 10 are shown in parentheses.
Weighted to population level using weights provided by SGC-MHS.

I use logistic mixed effects models to compare odds of blaming among BP, P, and nBP believers versus those of B believers (Table 2.16). Overall, B believers are least likely to blame V

[12] Although, note that in one of these countries, South Korea, there are only two B believers so its value is not reliable.

after controlling for sociodemographics and contact (Model 1). Compared to B believers, BP believers have 1.79 times the odds of blaming V (s.e.: 0.28, p-value: 0.002), and P believers have 1.74 times the odds (s.e.: 0.40, p-value: 0.026).

Table 2.16. Estimated Odds Ratios from Logistic Mixed Effects Models of Blame, Lack of Sympathy, and Bad Character Attribution By Etiological Belief Type (B, BP, P, nBP†)

Odds Ratios	Outcome: Blame (1)		+ Development (2)		Mental Illness Labelers Only (3)		Outcome: Lack of Sympathy (4)		Outcome: Bad Character Attribution (5)	
Intercept	1.37	(0.44)	1.37	(0.44)	1.40	(0.64)	0.44	(0.12)	0.46*	(0.17)
Fixed Effects										
Etiological Belief Type										
BP vs. B	1.79***	(0.28)	1.76***	(0.27)	1.82***	(0.36)	1.15	(0.27)	2.18***	(0.42)
x Development status			1.16	(0.35)	1.19	(0.51)	0.73	(0.33)	1.72	(0.55)
Developing										
Developed										
P vs. B	1.74**	(0.40)					1.29	(0.34)		
x Development status			2.28***	(0.40)	2.07**	(0.55)	1.10	(0.51)	1.88**	(0.55)
Developing			1.05	(0.17)	1.02	(0.26)			1.10	(0.27)
Developed			2.40***	(0.60)	2.11***	(0.50)			2.07**	(0.69)
nBP vs. B	1.81	(0.80)			2.44	(1.43)	1.83	(0.36)		
x Development states			4.14***	(1.67)	0.79	(0.42)	1.12	(0.45)	4.14*	(2.83)
Developing			0.77	(0.17)					0.39*	(0.13)
Developed			3.20***	(1.11)					1.62	(0.84)
Country Characteristics										
Development status			0.96	(0.57)	0.94	(0.37)	1.94	(0.95)	0.58	(0.27)
Random Effects†††										
Etiological Belief Type										
BP vs. B	0.23		0.17		0.33		0.38		0.08	
P vs. B	0.47		0.28		0.00		0.37		0.33	
nBP vs. B	0.89		0.00		0.84		0.00		0.76	
Residual Variation										
Between-country variation	1.34		1.34		1.29		1.16		0.85	
Observations	5,874		5,874		4,780		5,342		7,504	
Countries	17		17		17		17		17	

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

† Etiological Type abbreviations:

B: biomedical (biogenetic beliefs, no psychosocial beliefs)

BP: biopsychosocial (biogenetic and psychosocial beliefs)

P: psychosocial (psychosocial beliefs, no biogenetic beliefs)

nBP: non-medical (no biogenetic beliefs, no psychosocial beliefs)

All models control for sociodemographic and contact variables (not shown)

Random effects shown as unexponentiated standard deviations.

Standard errors shown in parentheses

*** p<0.01, ** p<0.05, * p<0.1

However, Model 2 finds clear differences by development status. The statistically significant and large-valued coefficients for the interaction terms show that the differences in odds of blaming between B believers and others is larger in developed countries. In other words, B belief is more protective against blaming in developed countries than in developing ones.

In addition, when etiological types are arranged in order of likelihood of blaming V, their relative positioning varies by development status. In developed countries, B believers are least likely to blame V. Their odds of blaming V are slightly over half those of BP believers (1/1.76) and 0.4 times those of P believers (1/1.84). In contrast, in developing countries, while B believers still tend to have the similarly lower odds of blaming compared to BP believers, they do not have lower odds than P believers (OR: 1.05, s.e.: 0.17, p-value: 0.761) or nBP believers (OR: 0.77, s.e.: 0.17, p-value: 0.261). Thus, while in developed countries the main outcome is that B believers have the lowest odds of blaming, the main outcome in developing countries is that BP believers have the highest odds. Results are similar when only mental illness labelers are considered (Model 3).

Models 4 and 5 show that ordering differences are mostly due to etiological types' relative odds of attributing V's problems to bad character: there is little difference among types in their likelihood of feeling unsympathetic toward V.

Discussion

The analysis at the beginning of this section suggests that, while reducing blame may a good goal in its own right, one can expect it to have a limited effect on stigma scores at both the individual and country level in most, although clearly not all, countries. This result underlines the theoretical point made earlier about the necessity of maintaining a conceptual distinction between blame and stigmatization. Discussions that minimize the distance between these ideas, or assume that addressing blame will solve the problem of schizophrenia stigmatization, are unlikely to yield fruitful results in many settings.

I also find that a disease framing is not a silver bullet for blame. Some of the evidence presented here does favor the idea that framing schizophrenia as a physically based disorder is a good way to remove blame. For example, in developed countries, B believers have the lowest odds of blaming V and the lowest odds of attributing V's problems to bad character.

However, there is other evidence that complicates the story. B believers are just as likely as any other etiological belief group to lack sympathy with V. In developing countries, biogenetic beliefs (B+BP) are associated with a higher likelihood of blame than non-biogenetic beliefs, while in developed countries, they are associated with an equal likelihood (not lower). Additionally, blaming, including bad character attribution, is surprisingly prevalent among B believers in many countries. In short, biogenetic beliefs do not have a clean relationship with blame.

Overall, the idea that a disease framing is a good solution to the problem of stigmatization because it reduces blame is fraught at best: a disease framing in associated with a decreased likelihood of regarding V as blameworthy in some contexts and not others, non-blaming is associated with only slightly lower stigma scores, and finally, biogenetic beliefs are associated with higher levels of stigma even after controlling for blame.

Analysis — Prognostic Pessimism

The objective in this section is to understand more about the role of prognostic pessimism in the stigmatization of people with schizophrenia. Recall that a respondent is considered to exhibit prognostic pessimism if she believes that it is unlikely or very unlikely that V's problems will improve, either with treatment or on their own. The inverse of this, prognostic optimism, occurs when R believes that V's problems are likely or very likely to improve on their own or with treatment.

The vast majority of respondents believe that V's problem can improve, either with treatment or without (Table 2.17). In a typical country, 94% of respondents believe that V's problems can improve: 93% believe that V's problems will improve with treatment, and 25% believe that they will improve on their own.

Table 2.17. Country-Level Descriptive Statistics for Prognostic Pessimism				
	Mean	Standard deviation	Min	Max
% Prognostic pessimism	6	5	1	20
% Improve on own is unlikely	75	19	28	94
% Improve with treatment is unlikely	7	5	1	19
Source: Stigma in Global Context - Mental Health Survey (SGC-MHS) Weighted to each country's population level using weights provided by SGC-MHS				

These overall averages are representative of most countries (Table 2.18). In three quarters of countries surveyed, less than 10% of the population exhibits prognostic pessimism. Numbers are fairly similar when only mental illness labelers are considered, except that in most countries, mental illness labelers are rather less likely to believe that V's problems will improve on their own. In a few countries, schizophrenia labelers are slightly more optimistic about V's prognosis than other people (USA, New Zealand, Great Britain, Brazil), but in most countries, respondents who attribute V's problems to schizophrenia tend to more pessimistic, and in some countries, quite significantly so (e.g., Germany, Hungary, Bulgaria, South Korea).

Table 2.18. Percentage of Respondents Exhibiting Prognostic Pessimism, by Country and Labeling						
	All Respondents			Mental Illness Labelers Only		
Country	% Prognostic pessimism	% Improve on own is unlikely	% Improve with treatment is unlikely	% Prognostic pessimism	% Improve on own is unlikely	% Improve with treatment is unlikely
USA	1	88	1	1	90	0
New Zealand	1	82	2	1	89	1
Bangladesh	2	75	2	2	76	2
Argentina	2	69	3	2	78	2
Iceland	3	92	3	2	94	2
China	3	37	4	4	39	4
Great Britain	4	93	4	3	93	3
South Korea	4	62	5	4	67	5
South Africa	4	67	6	2	70	3
Belgium	4	89	5	3	92	4
Brazil	5	78	9	3	78	5
Philippines	6	28	9	5	29	7
Bulgaria	10	74	10	10	77	10
Hungary	11	87	10	9	88	8
Germany	13	83	13	13	85	14
Spain	15	80	15	17	83	16
Cyprus	20	94	19	20	94	20
Source: Stigma in Global Context - Mental Health Survey (SGC-MHS) Weighted to population level using weights provided by SGC-MHS						

Countries are quite similar to each other in terms of overall prognostic pessimism (s.d.: 5%) and of pessimism regarding treatment (s.d.: 5%). The main difference from country to country is in whether treatment is considered necessary for improvement (s.d.: 19%). While respondents in developing and developed countries are equally unlikely to exhibit treatment pessimism (OR: 1.05, s.e.: 0.41, p-value: 0.907), those in developed countries are much more likely to exhibit improve-on-own pessimism (OR: 3.96, s.e.: 0.09, p-value: 0.000). This difference persists when one considers only mental illness labelers[13].

Relationship Between Prognostic Pessimism and Stigma

Question 3.1 asks whether prognostic pessimism is an important component of the stigmatization of people with schizophrenia. As was done with blame, I consider two aspects of "importance". First, is prognostic pessimism associated with higher stigma scores at the individual level, and second, is the expected impact on countries' levels of public stigma of removing prognostic pessimism large?

The results of mixed effects models relating prognostic pessimism and stigma scores (Table 2.19) are consistent with the expectation that prognostic pessimism is associated with higher stigma scores. After controlling for sociodemographic and contact variables, prognostic pessimism is associated with an average increase in stigma score of 10.7 points (Model 1; s.e.: 1.9, p-value: 0.000). The coefficient is slightly smaller but still large and statistically significant once other beliefs are controlled for (Model 3) and when only mental illness labelers are considered (Model 4). The size of the coefficient varies by up to 20 points from country to country (as shown by the random effects in Models 1-4) but not by development status (as shown by the insignificant interaction terms in Models 2-4).

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[13] China and the Philippines stand out as countries in which respondents are remarkably likely to believe that V's mental illness will improve on its own (61% and 71% respectively).

Table 2.19. Mixed Models of Overall Stigma Score by Prognosis Response

Overall Stigma Score (0-100)	Prognostic Pessimism (1)		+ Development (2)		+ Potential Confounders (3)		Mental Illness Labelers Only (4)	
Intercept	48.1***	(2.7)	48.1***	(2.7)	48.4***	(2.6)	49.8***	(2.4)
Fixed Effects†								
Prognostic Pessimism	10.7***	(1.9)	10.7***	(1.8)	7.2***	(2.0)	7.4***	(2.2)
Treatment pessimism	6.4***	(1.8)	6.4***	(1.6)	5.3***	(1.6)	5.7***	(1.9)
Improve-on-own pessimism	11.5***	(1.3)	11.6***	(1.3)	8.8***	(1.4)	9.0***	(1.6)
Interactions								
Prognostic pessimism x Development			-2.0	(3.7)	-1.1	(4.1)	-1.3	(4.3)
Treatment pessimism x Development			4.8	(3.4)	0.1	(3.3)	0.3	(3.6)
Improve-on-own pessimism x Development			-2.8	(2.6)	-1.8	(2.7)	-0.7	(3.0)
Labels								
Mental illness					6.9***	(1.3)	—	—
Schizophrenia					10.1***	(1.2)	9.8***	(1.4)
Etiological Belief Type†								
BP vs. B					-4.4***	(1.2)	-3.9**	(1.4)
P vs. B					-8.9***	(2.3)	-10.3***	(2.4)
nBP vs. B					-8.2***	(2.2)	-5.3	(3.1)
Blame								
Lack of sympathy					2.8**	(1.2)	2.0*	(1.0)
Bad character attribution					3.4**	(1.4)	-3.4**	(1.3)
Country Characteristics								
Development status			-1.5	(5.9)	-1.4	(5.9)	-1.8	(5.9)
Random Effects *(given as std. dev.)*								
Prognostic pessimism	5.1		4.9		4.4		5.0	
Treatment pessimism	4.9		3.8		1.3		1.3	
Improve-on-own pessimism	4.2		3.9		3.8		4.3	
Residual Variation								
Within-country variation	563.0		563.0		490.1		482.6	
Between-country variation	121.7		120.9		128.7		126.8	
Observations	7,822		7,822		4,971		4,086	
Countries	17		17		17		17	

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

All models control for sociodemographic and contact variables (not shown)

† Etiological Type abbreviations:

B: biomedical (biogenetic beliefs, no psychosocial beliefs)

BP: biopsychosocial (biogenetic and psychosocial beliefs)

P: psychosocial (psychosocial beliefs, no biogenetic beliefs)

nBP: non-medical (no biogenetic beliefs, no psychosocial beliefs)

Values for treatment pessimism and improve-on-own pessimism are from independent but otherwise identical models that use each of these variables as a substitute for the overall prognostic pessimism variable.

Standard errors shown in parentheses

Models 3 and 4 include interaction effects between development status and etiological belief type (not shown) and between development status and blame (not shown) since these interactions were shown to be significant in previous models. Interactions between development status and labels were not significant and so have not been included.

*** p<0.01, ** p<0.05, * p<0.1

A comparison of treatment pessimism and improve-on-own pessimism coefficients shows that the latter is almost double that of the former. Those who believe that V's problem is unlikely to improve with treatment have an average stigma score that is 6.4 points higher (s.e.: 1.8, p-value: 0.003) than other similar respondents who think it is likely, while those who believe that V's problem

is unlikely to improve on its own have an average stigma score that is 11.5 points higher (s.e.: 1.3, p-value: 0.000) than other similar respondents who think it is likely.

I speculate that this may reflect a difference between ideas of full and partial recovery. Possibly respondents who think that the problem will improve on its own are anticipating that it will simply "go away" and thus that the vignette person will be cured. On the other hand, "treatment" may well imply medical management of rather than curing of illness. "Improve with treatment" respondents may believe that the problem will merely improve (i.e., the vignette person will not be cured). Another possibility is that it reflects differences in essentialist views: if a problem can improve on its own, it may seem less intrinsic as well as less intractable than a problem that requires outside intervention.

Table 2.20. Country-Specific Prognostic Pessimism Effects

Country	Prognostic Pessimism Coeff.	% Pessimistic	Country-Level Pessimism Effect	Actual Mean Stigma Score	% Change if No Pessimism
USA	0.7	1	0.0	49	-0.0
New Zealand	1.2	1	0.0	37	-0.0
Philippines	0.9	6	0.1	55	-0.1
Brazil	2.7	5	0.1	41	-0.4
Bangladesh	18.6	2	0.4	73	-0.5
Argentina	9.9	2	0.2	35	-0.6
Great Britain	7.5	4	0.3	41	-0.7
Iceland	10.2	3	0.3	36	-0.8
Spain	3.2	15	0.5	48	-1.0
South Africa	14.8	4	0.6	43	-1.4
South Korea	19.4	4	0.8	50	-1.5
Belgium	16.4	4	0.7	44	-1.6
China	19.4	3	0.7	42	-1.6
Bulgaria	11.5	10	1.2	54	-2.2
Hungary	13.0	11	1.4	54	-2.6
Cyprus	12.8	20	2.6	73	-3.5
Germany	23.2	13	2.9	40	-7.3

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
Weighted to population levels with weights provided by SGC-MHS
*** p<0.01, ** p<0.05, * p<0.1

Next I estimate the effect on levels of public stigma if everyone were to become optimistic about V's prognosis. I use the same method as was used in the previous analysis section to

understand whether blame is important to stigma. By multiplying the fraction of respondents in each country who express prognostic pessimism by the coefficient for prognostic pessimism within that country one can estimate the expected effect on country levels of public stigma if all prognostic pessimism were to disappear. Results are shown in Table 2.20.

In most countries, the expected change in levels of public stigma resulting from convincing everyone to be optimistic about V's prognosis is less than one point. The most significant effects are expected to be in Germany and Cyprus, where high rates of prognostic pessimism combined with very large coefficients result in an estimate of a 2.9-point and a 2.6-point decrease in levels of public stigma, respectively. In all but two countries (Hungary, Cyprus, and Germany), the percent change in country mean stigma score is less than 3%, and in all but four countries, it is less than 2%.

Relationship Between Etiological Beliefs and Prognostic Pessimism

Question 3.2 asks whether prognostic pessimism mediates between biogenetic beliefs and stigma. If it does, then given that biogenetic beliefs are associated with higher stigma scores, two additional conditions must hold. First, the prognostic pessimism must be associated with higher stigma scores (which it is, as just discussed), and second, biogenetic beliefs must be associated with higher likelihood of prognostic pessimism. The truth of this condition is assessed in this section.

Table 2.21 shows logistic mixed effects models which show how etiological beliefs vary in their likelihood of association with prognostic pessimism. These models' outcomes are the estimated odds ratios of prognostic pessimism (on-own, with-treatment, and overall) between the four types of etiological types, with B believers as the base case.

Table 2.22 shows the ratio between all biogenetic believers' (B+BP) and all non-biogenetic believers' (P+nBP) odds to assess whether biogenetic beliefs as a whole are associated with higher likelihood of prognostic pessimism. As before, models control for sociodemographic variables and

contact experience. Because rates of overall pessimism and treatment pessimism are low, the odds ratios in these models can reasonably be considered good approximations for the risk ratios.

Table 2.21. Estimated Odds Ratios from Logistic Fixed Effects Models of Prognostic Pessimism By Etiological Belief Type

Odds Ratios	Outcome: Prognostic Pessimism (1)		+ Development (2)		Mental Illness Labelers Only (3)		Outcome: Treatment Pessimism (4)		Outcome: Improve-On-Own Pessimism (5)	
Intercept	0.05***	(0.01)	0.05***	(0.01)	0.03***	(0.01)	0.06***	(0.02)	3.64***	(0.72)
Fixed Effects										
Etiological Belief Type†										
BP vs. B	0.56***	(0.07)	0.54***	(0.08)	0.57***	(0.06)	0.63***	(0.10)	0.69**	(0.10)
P vs. B	0.60**	(0.14)	0.58**	(0.13)	0.31**	(0.16)	0.90	(0.18)	0.37***	(0.07)
nBP vs. B	0.61	(0.26)	0.59	(0.25)	0.20***	(0.08)	0.93	(0.28)	0.42***	(0.11)
Interactions										
BP vs. B x Developed			1.15	(0.35)	0.90	(0.21)	0.82	(0.27)	0.61*	(0.17)
P vs. B x Developed			1.79	(0.87)	4.30	(5.42)	1.15	(0.55)	0.52*	(0.18)
nBP vs. B x Developed			1.05	(0.63)	20.69***	(16.28)	0.54	(0.24)	0.49	(0.22)
Country Characteristics										
Development status			1.25	(0.56)	1.85	(0.89)	1.01	(0.43)	4.10***	(1.6)
Random Effects										
Etiological Belief Type										
BP vs. B	0.00		0.00		0.00		0.00		0.00	
P vs. B	0.60		0.60		1.55		0.39		0.49	
nBP vs. B	0.68		0.66		0.00		0.41		0.00	
Residual Variation										
Between-country variation	0.85		0.84		1.09		0.71		0.52	
Observations	7,688		7,688		6,192		7,616		7,563	
Countries	17		17		17		17		17	

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
† Etiological Type abbreviations:
B: biomedical (biogenetic beliefs, no psychosocial beliefs)
BP: biopsychosocial (biogenetic and psychosocial beliefs)
P: psychosocial (psychosocial beliefs, no biogenetic beliefs)
nBP: non-medical (no biogenetic beliefs, no psychosocial beliefs)
All models control for sociodemographic and contact variables (not shown).
Random effects shown as unexponentiated standard deviations.
Standard errors shown in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2.21 shows that B believers are more likely to be pessimistic about on-own improvement (Model 5; OR: 1/0.69=1.45, p-value: 0.035), with-treatment improvement (Model 4; OR: 1/0.63=1.59, p-value: 0.003), and overall improvement (Model 1; OR: 1/0.56=1.79, p-value: 0.000) than are BP believers. This is the case regardless of development status[14] (Model 2) and

[14] I note that people in developed countries have approximately four times the odds of people in developing countries of believing that V's problems cannot improve on their own (Model 5, Table 2.21). They have similar beliefs about treatment however (Model 4, Table 2.21).

when only mental illness labelers are considered (Model 3). It is also remarkably consistent across countries, as shown by the small random effect in each model.

P believers tend to view treatment prognosis similarly to B believers (Model 4; OR: 0.90, p-value: 0.613), except they are more likely than either B or BP believers to think that V's problem can improve on its own. This may be the reason why they are more optimistic than B believers overall (Model 2), although they are similarly optimistic compared to BP believers (not shown: OR: 1.07, s.e.: 0.25, p-value: 0.769). However, random effect for P vs. B (and P vs. BP; not shown: 0.61) is quite large, suggesting that there is a lack of consistency in this relationship across countries. One can expect that in many countries P believers will be more optimistic than B believers and in others that they will be less, although the balance tends to favor P believers.

In summary, B and BP believers have quite different odds of prognostic pessimism, and the relationship between B and P believers has little consistency from country to country.

What does this mean for the overall effect of attributing V's problems to a brain disease/ genetics on prognostic pessimism? Table 2.22 shows that biogenetic believers have almost twice the odds of being pessimistic about V's problems improving on their own (Model 5; OR: 1.88, p-value: 0.001). On the other hand, they may be less likely, although this does not achieve significance, to be pessimistic about V's prognosis with treatment (Model 4; OR: 0.72, s.e.: 0.15, p-value: 0.146). As a result, biogenetic believers' overall odds of prognostic pessimism are basically indistinguishable from those of non-believers (Model 1; OR: 0.99, p-value: 0.948). When only mental illness labelers are considered (Model 3), the point estimate for the odds ratio is much higher but does not achieve statistical significance (OR: 1.82, p-value: 0.196), and the random effect is very large. In essence, there is no sign of a consistent relationship between biogenetic beliefs and prognostic pessimism, except that biogenetic beliefs is associated with higher odds of on-own pessimism.

Table 2.22. Estimated Odds Ratios from Logistic Mixed Effects Models of Prognostic Pessimism by Biogenetic Belief Status

Odds Ratios	Outcome: Prognostic Pessimism (1)		+ Development (2)		Mental Illness Labelers Only (3)		Outcome: Treatment Pessimism (4)		Outcome: Improve-On-Own Pessimism (5)	
Intercept	0.05***	(0.01)	0.05***	(0.01)	0.04***	(0.01)	0.06***	(0.02)	3.60***	(0.70)
Fixed Effects										
Biogenetic beliefs held (vs. not)	0.99	(0.20)	1.00	(0.20)	1.82	(0.80)	0.72	(0.15)	1.88***	(0.28)
x Development			0.71	(0.30)	0.21	(0.24)	0.81	(0.40)	1.18	(0.30)
Country Characteristics										
Development Status			1.26	(0.57)	1.76	(0.81)	1.02	(0.44)	4.03***	(1.57)
Random Effects										
Biogenetic beliefs held (vs. not)	0.45		0.48		1.25		0.40		0.36	
Residual Variation										
Between-country variation	0.84		0.82		1.04		0.71		0.51	
Observations	7,690		7,690		6,192		7,618		7,564	
Countries	17		17		17		17		17	

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)
All models control for sociodemographic and contact variables (not shown).
Random effects shown as unexponentiated standard deviations.
Standard errors shown in parentheses
*** p<0.01, ** p<0.05, * p<0.1

What do these results imply about essentialist claims that biogenetic beliefs increase prognostic pessimism? The highly consistent relationship between B and BP believers' odds tends to support essentialist arguments, as does the statistically significant difference between P and B believers: the more purely intrinsic the origin is believed to be, the higher the likelihood of prognostic pessimism. On the other hand, when all biogenetic believers are lumped together and compared to all non-biogenetic believers, odds of overall prognostic pessimism are essentially indistinguishable. This is at least partially because the relationship between P believers and B/BP believers tends to be quite variable. There is significant cross-country difference in which of the two yields more overall optimism. This suggests that the essentialist-predicted prognosis effects of biogenetic essentialism are either not present in some countries, or are present to a much lesser extent, or that they are outweighed by confidence in medical science (or some other factor). There does not seem to be the widespread, strong relationship between biogenetic beliefs and prognostic pessimism that essentialist arguments would suggest.

Is Prognostic Pessimism a Mediator?

If prognostic pessimism is a mediator between biogenetic beliefs and stigma, then three things must be true. First, biogenetic believers must have higher stigma scores; this was shown in an earlier analysis section. Second, biogenetic beliefs must be associated with higher odds of prognostic pessimism. And third, prognostic pessimism must be associated with higher stigma scores[15].

We have seen previously that prognostic pessimism is associated with higher stigma scores, but also that biogenetic believers are neither more nor less likely to be prognostic pessimists. This would imply that prognostic pessimism cannot explain why biogenetic believers have higher stigma scores than others. However, I also showed that there is a diversity of relationships between beliefs and prognostic pessimism within the category of "biogenetic": B and BP believers have quite different odds of prognostic pessimism. Since B believers are more likely to be pessimistic than others and also tend to have higher stigma scores than others, it is possible that the former explains some part of the latter.

In this section, I give an estimate of the extent to which prognostic pessimism contributes to the higher stigma scores of B believers. This can be done by comparing the values of the coefficient for a given type of belief in two models whose outcome variable is stigma score: one model that does not account for prognostic pessimism (Base Model) and one that does (+ Overall Prognostic Pessimism). As before, all models include controls for the sociodemographic variables and contact. Table 2.23 gives the coefficients for specific etiological beliefs resulting from this process and the estimated extent to which prognostic pessimism mediates the relationship between specific etiological beliefs and stigma.

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[15] Or conversely, that biogenetic beliefs are associated with lower odds of prognostic pessimism, and prognostic pessimism is associated with lower stigma scores. This is not the case.

Table 2.23. Mediation Analysis: Adjusted Coefficients for Etiological Belief Categories from Mixed Effects Models with Stigma Score as the Outcome, and Resulting Percentage of Stigma Score Differences Explained by Prognostic Pessimism

Models	Coefficient: Biogenetic vs. Not		Coefficient: B† vs. Others		Coefficient: B vs. BP†		Coefficient: B vs. P†		Coefficient: B vs. nBP†	
— All Respondents —										
Base Model	8.66***	(1.25)								
Developing			-0.27	(1.82)	-3.40**	(1.36)	6.62***	(2.25)	6.14**	(2.32)
Developed			10.12***	(1.32)	8.29***	(1.13)	16.02***	(2.47)	13.30***	(3.10)
+ Overall Prognostic Pessimism	8.65***	(1.20)								
Developing			-0.35	(1.80)	-3.52**	(1.34)	6.46***	(2.18)	6.07**	(2.28)
Developed			9.75***	(1.34)	7.93***	(1.16)	15.68***	(2.30)	13.07***	(3.41)
— Mental Illness Labelers Only —										
Base Model	7.93***	(1.35)								
Developing			-2.04	(2.16)	-3.07	(2.21)	7.77***	(2.40)	-5.05	(4.01)
Developed			9.75***	(1.65)	8.49***	(1.51)	15.38***	(3.14)	12.70***	(2.50)
+ Overall Prognostic Pessimism	7.82***	(1.33)								
Developing			-2.10	(2.27)	-3.19	(2.28)	7.43***	(2.28)	-5.41	(4.06)
Developed			9.28***	(1.63)	8.01***	(1.48)	14.94***	(3.00)	12.42***	(2.73)
% Explained by Pessimism										
All Respondents	0.1%									
Developing			inconsistent		inconsistent		2.4%		1.1%	
Developed			3.7%		4.3%		2.1%		1.7%	
Mental Illness Labelers Only	1.4%									
Developing			inconsistent		inconsistent		4.4%		inconsistent	
Developed			4.8%		5.7%		2.9%		2.2%	

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

*** p<0.01, ** p<0.05, * p<0.1

All models control for sociodemographic and contact variables and include random effects for etiological and pessimism variables. The sample in each case has been limited to ensure consistent samples across nested models.

Standard errors are given in parentheses.

† Etiological Type abbreviations:

B: biomedical (biogenetic beliefs, no psychosocial beliefs)

BP: biopsychosocial (biogenetic and psychosocial beliefs)

P: psychosocial (psychosocial beliefs, no biogenetic beliefs)

nBP: non-medical (no biogenetic beliefs, no psychosocial beliefs)

Prognostic pessimism explains between 0% and 6% of differences in stigma scores among etiological groups, depending on which groups are compared and on country development status. The proportion explained tends to be higher when only mental illness labelers are considered than when the entire population is considered, and tends to be higher in developed countries than in developing ones.

A few comparisons yield inconsistent mediation[16], such as for B vs. others in developing countries. Inconsistent mediation was only found with respect to developing countries. Of those relationships that show consistent mediation, the extent of that mediation is small. For example, the lower stigma scores of P believers when compared to B believers (Table 2.19; β: 6.62, s.e.: 2.25, p-

[16] Results of this type occur when B believers have lower stigma scores than others, but have higher rates of prognostic pessimism.

value: 0.010) can be partially explained (2.4%) by their lower odds of prognostic pessimism (Table 2.21; OR: 0.54, s.e.: 0.08, p-value: 0.000). In all developed countries, mediation is consistent but still quite small.

In general then, prognostic pessimism is a minor, partial mediator between etiological beliefs and stigma, with more explanatory value in developed countries than developing ones.

Discussion

The point of this analysis section was to gain some understanding of the role of prognostic pessimism in stigmatization with three emphases: the overall importance of prognostic pessimism to stigmatization (Question 3.1), the potential mediator status of prognostic pessimism between biogenetic beliefs and stigma (Question 3.2), and the consistency in these relationships across country contexts (Question 3.3).

First I note that prognostic pessimism is rather uncommon, mostly because of the high prevalence in almost every country of improve-with-treatment optimism. Prognostic optimism is associated with an 8-point decrease in stigma scores, with improve-on-own optimism having almost double the effect of improve-with-treatment optimism.

Biogenetic believers tend to be just as pessimistic about overall prognosis as non-biogenetic believers. B believers are the most pessimistic among the four types, with B believers being almost twice as likely as other biogenetic believers (BP) to express prognostic pessimism. This is similar to the relationship between etiological beliefs and stigma scores, suggesting the possibility that higher odds of prognostic pessimism explain some or all of the higher stigma scores among specific etiological groups. However, the mediation analysis suggests that prognostic pessimism is at most a minor partial mediator between etiological beliefs and stigma, explaining between 1% and 6% of the relationships considered, with more mediation present in developed countries than in developing ones.

These are the results for a "typical" country. But this analysis also found variation from country to country that is large enough to suggest different, not merely larger or smaller, relationships than the "typical" results described. It also observable that the developed-developing divide explains very little about differences among countries in the relationships between pessimism and stigma scores or between pessimism and etiological beliefs. While there is significant variation in these relationships from country to country, development status seems to have little to do with it. This is not merely a caveat to the overall results. Instead it is in itself a point to be noticed: the consequences of specific etiological beliefs are highly variable and context-dependent.

Even if prognostic pessimism does not explain biogenetic believers' higher stigma scores, is it still independently "important" for stigma? In one sense, prognostic pessimism appears to be important to stigma in many countries. On average, prognostic pessimism is associated with stigma scores that are around 8 points higher. Higher stigma scores are found for treatment pessimism, on-own pessimism, and overall pessimism after accounting for a variety of other factors.

However, prognostic pessimism is not particularly important at the country level: the expected effect of convincing everyone in a given country to be optimistic about V's problems is usually very small (less than one point out of 100), despite the typically large difference in stigma scores between pessimistic and optimistic respondents. The reason is that prognostic pessimism is relatively unusual in most countries. While most people do not think that V's problems will improve on their own, the vast majority in most countries do believe that V's problems will improve with treatment. As a result, many countries are almost at saturation levels with overall prognostic optimism: V's problems will improve somehow, according to almost everyone in most countries surveyed. For countries where this is not the case (Germany, Cyprus), changes to prognostic pessimism may offer a way forward on reducing stigma, but nonetheless, even in these countries, the effect on public stigma levels is expected to be less than a 3-point decrease.

It is possible that encouraging improve-on-own optimism specifically would be more effective at reducing stigma. Its expected effect on individual stigma scores is about twice that of improve-with-treatment optimism, and it is also much less common. It is also possible that encouraging people to believe that V could be cured (rather than that her condition can be improved) would be more impactful[17]. However, it unlikely that either of these attitudes would be promoted through public education campaigns, since neither perspective enjoys the support of psychiatrists. This is one of several instances where promulgating "true facts" about schizophrenia may increase stigmatization rather than decrease it.

One thing that stands out from the analyses on the two proposed mechanisms between etiological belief and stigma, namely blame and prognostic pessimism, is that intuitive reasoning about how people will react to basic beliefs is borne out. Regardless of country, people who blame someone will generally exhibit more stigma against that person than people who do not. Similarly, regardless of country, people who think someone's problem is going to go away will generally exhibit less stigma against that person. Thus, there is nothing unexpected about how individuals tend to react at this level.

However, what is perhaps not as expected is how specific etiologies relate to these more basic beliefs. It is part of the education paradigm that biogenetic etiological beliefs will reduce blame, and will increase prognostic optimism. This assumption is not borne out in general, and is also where contextual differences are prominent. Some countries do have the expected relationships but many do not, and these relationships cannot be characterized as typical.

There is more consistent evidence in favor of the essentialist perspective on biogenetic beliefs, which posits that biogenetic beliefs lead to the sense that a person's illness is intrinsic to them. Problems that are intrinsic to a person are unlikely to go away on their own, and biogenetic

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[17] Unfortunately, there is no data to this effect, since respondents were not asked about the possibility of V being cured.

believers are much more likely than others to exhibit improve-on-own pessimism. In contrast, many people are familiar with ways in which powerful medical interventions can alter or even remove parts of a person's intrinsic nature (e.g., lobotomies, LSD). Therefore, it is not be surprising that people having an essentialist view of V (as biogenetic believers do in the essentialist view) are just as likely as others to think that V's problems can improve with treatment.

Chapter 3. Using Individual-Level Characteristics to Explain Variation in Levels of Public Stigma

In Chapter 2, we were interested in individual-level outcomes, each person's individual stigma score. The fact that individuals are grouped into countries was mostly conceived of as an analytic annoyance necessitating the use of multilevel models. In this chapter, country-level outcomes are now the focus. This chapter examines the variation in levels of public stigma across countries. Level of public stigma is a country-level outcome, the mean stigma score in each country. I describe international differences in population attitudes toward people with schizophrenia (level of public stigma), and assess whether these differences are large enough to be considered important to explain. Second, I examine to what extent differences in the prevalence of individual-level characteristics can explain the observed variation.

Does Variation Exist?

There is a great deal of existing literature that suggests one should expect stigma to vary from country to country. Work from medical anthropology shows that "stigma and stigmatised individuals [are] embedded in local moral contexts" (Kleinman and Hall-Clifford, 2009; Kleinman, Wange, Li, Chen, et al. 1995). This implies that the experiences of individuals will vary according to their particular social and personal circumstances, and also from culture to culture (or sub-culture). Ethnographic accounts of people with schizophrenia in different countries attest to the variety of experiences of illness both within and across cultures (e.g., Luhrmann and Marrow, 2016; Jenkins and Barrett, 2004; Jenkins, 2015).

There are many studies that focus on the nature of stigma in a specific culture or sub-culture (e.g., Koschorke, Padmavati, Kumar, Cohen, et al., 2014; Yang and Kleinman, 2008; Kohrt and Harper, 2008; Evans-Lacko, Henderson, and Thornicroft, 2013; Weatherhead and Daiches, 2010;

Coker 2005; Jenkins and Carpenter-Song, 2008; Ng, 1997; Littlewood, Jadbav, and Ryder, 2007; Arthur, Hickling, Robertson-Hickling, Haynes-Robinson, et al. 2010; Yarris and Ponting, 2019). By looking across this body of work, one can observe the extensive differences in how "the meanings, practices and outcomes of stigma differ" (Yang, Kleinman, Link, Phelan, Lee, et al., 2007). It suggests that the nature of stigmatization, its manifestations, and its severity vary across countries.

In addition to these works, there are quantitative studies that directly compare mental illness stigma in two or more countries. Examples of this type of work include Griffiths, Nakane, Chistensen, Yoshioka, et al. (2006; Australia vs. Japan), Nersessova, Jurcik, and Hulsey (2019; Russia vs. USA), Wig, Suleiman, Routledge, Srinivasa Murthy, et al. (1980; India, Sudan, and the Philippines), Manago, Pescosolido, and Olafsdottir (2019; Iceland, German, and USA), and Angermeyer, Buyantugs, Kenzine, and Matschinger (2004; Germany, Russia, and Mongolia). Work of this type suggests that between specific pairs or small sets of countries, variation in public stigma is indeed present.

As a body, existing work implies that public stigma will be different (at least in style) if it were to be explicitly compared in different countries, but there is very little direct comparison. Specifically, cross-country quantitative comparisons using the same methodology in each location and measuring degree or severity of public stigma are relatively rare. Among those that exist, one tends to see only a small number of countries compared, usually only two or three. Where this is not the case, cross-country differences in stigma are usually not of central importance. For example, Evans-Lacko, Brohan, Mojtabai, and Thornicroft (2012) use country-level characteristics as explainers of differences between individuals' perceived discrimination and devaluation (PDD[1]), but do not consider variation in mean PDD scores across countries. Krajewskin, Burazeri, and Brand (2013) and Thornicroft, Brohan, Rose, Sartorius, and Leese (2009) observe the presence of

[1] It is also worth noting that PDD is not the same as public stigma. PDD is based on the experiences of people with mental illness, whereas public stigma is based on the feelings of the general public.

differences in country mean levels of PDD, but are primarily interested in these differences because they necessitate statistical adjustments for clustering.

The handful of studies to which none of these concerns apply are either quite vague in measurement (e.g., Pescosolido, Martin, Long, Olafsdottir, Kafadar, and Medina, 2015, pg. 803: "larger […] circles indicate greater prejudice") or only consider European countries (e.g., Bracke, Delaruelle, and Verhaeghe, 2019). In short, while existing literature is strongly suggestive of differences, there have been only limited attempts to quantify cross-country variation in levels of public stigma. Several scholars have identified this gap in the literature and called for its redress (Pescosolido, Medina, Martin, and Long, 2013; Yang, Thornicroft, Alvarado, Vega, and Link, 2014; Pescosolido, Martin, Long, Olafsdottir, Kafadar, and Medina, 2015; Lasalvia, Bortel, Bonetto, Jayaram, et al., 2015).

This chapter offers a quantification of the variation in levels of public stigma across countries, and gives an assessment of how meaningful these differences are.

What Can Individual-Level Characteristics Explain?

In the previous chapter, I characterized the relationships between individuals' characteristics, such as the beliefs they hold about mental illness, and their stigma scores within a given country. Those beliefs of individuals that are statistically significantly related to higher stigma scores, and which vary in prevalence from country to country are in a position to explain some of the cross-country variation in mean stigma scores.

For example, Chapter 2 showed that within a given country, those who believe that mental illnesses are biogenetic in origin tend to have higher stigma scores than their compatriots. Countries vary in what fraction of their population holds this belief. Eighty-seven percent of Cypriots hold this belief, which is about one standard deviation above the mean prevalence among the countries surveyed. In contrast, only 65% of Chinese people hold this belief, which is about one standard

deviation below the mean. At the same time, the mean stigma score of people in Cyprus is 75 (~2 s.d. above the mean) while the mean stigma score for people in China is 43 (~1 s.d. below the mean). One can ask, does Cyprus have a higher mean stigma score than China because more of its people hold biogenetic etiological beliefs?

Models from Chapter 2 suggest that this is possible because they showed that, holding everything else about a country and the people in it constant and assuming causality, a person who changes their etiological beliefs to include biogenetics will see their stigma scores increase by almost 10 points. So, perhaps if the fraction of Cypriots attributing mental illnesses to biogenetic causes decreased to match that of China, there would be little difference between the countries in levels of public stigma. The same argument can be made for other beliefs.

Alternatively, it may be that there are differences between the two countries, such as social-structural, cultural, or historical factors, that are the source of most of the difference in their mean stigma score. So, even if the two countries had the same proportion of biogenetic believers, their stigma scores might still be very far apart or even just as far apart as they are now.

If this is the case, then the relative importance of individuals' beliefs would pale in comparison to the importance of other (as yet unidentified) factors. This might cause one to question the value of education designed to change individuals' beliefs as a means of reducing stigma: some countries would have very high levels of stigma compared to others even if everyone in that country were 'educated' to hold 'correct' beliefs about schizophrenia. This chapter is concerned with understanding the extent to which that is the case. To what extent can differences in the prevalence of certain beliefs about schizophrenia explain the variation in levels of public stigma between countries? Or, how much of a role do people's beliefs play in generating public stigma levels? As far as I am aware, there has been no literature that addresses this question.

Cross-Country Variation in Levels of Public Stigma, and Its Importance

Stigma Measures

I examine stigma at several levels of aggregation, each of which offers a different perspective on stigma. At the most granular level are the 20 individual stigma questions. The least granular is the overall stigma score derived from these 20 questions, which was the focus of Chapter 2. In this chapter, the individual questions, the overall stigma score, and three sub-scores (Intolerance, Social Distance, and Role Exclusion) are all considered. Recall from Chapter 1 that the overall stigma score ranges from 0 to 100, and the sub-scores range from 0 to 10. The allocation of questions into sub-scales and reliability measures for these scales can be found in Chapter 1.

Method: Are Cross Country Differences Present?

An examination of countries' mean stigma scores, sub-scores, and prevalences of stigmatizing responses to the individual questions give an initial indication of how countries' levels of public stigma are different from each other. To assess whether countries' levels of public stigma truly differ from each other, I compare the null model ($y_i=\beta_0+\epsilon_i$) to the random-intercept model ($y_i=\beta_0+u_j+\epsilon_{ij}$). In the null model, β_0 is the mean stigma score of all respondents. In the random-intercept model, β_0 is the mean of all countries' public stigma scores (the mean of means, or the average intercept). ϵ_{ij} is how far respondent i's stigma score is from her country j's mean stigma score, and u_j is how far country j's mean is from β_0. If the variance in u_j is 0, then countries' mean stigma scores do not vary.

To test the null hypothesis that u_j does not vary across groups, the standard approach is to use a likelihood ratio test comparing the goodness of fit of the random-intercept model to that of the null model (Raudenbush and Bryk, 2002). There are a few known problems with this approach (Crainiceanu and Ruppert, 2004), the main result of which is that the standard software

implementations of the test tend to be too conservative (Hui, Müller, and Welsh, 2019). Despite this, the likelihood ratio test and associated one-tailed p-value remain the standard method for testing for the presence of random effects (Wang, Xie, and Fisher, 2011). In addition, the fact that it is more prone to fail to reject the null hypothesis than it is to give a false indication of non-zero variance is not problematic in this case, since it does not cast doubt on the central conclusion, which is that the variability found is actually present.

Therefore, it is the method that I use to give a statistical assessment of the claim that countries' average stigma scores vary. I repeat the process with the three sub-scales and with the twenty individual questions that compose the scales. The models for the individual questions are logistic, since the outcome variables are binary (a stigmatizing response given or a non-stigmatizing response given), but otherwise the approach is unchanged.

Method: Are Cross-Country Differences Important?

I use the intra-class correlation coefficients (ICC) of empty random-intercept models to characterize the importance of the cross-country differences in public stigma level. As previously described, residuals in the random-intercept model are split into within-country errors and between-country errors. The ICC is the between-country variance divided by the total variance. In other words, it is the proportion of the total variance that is explained by the grouping of respondents into countries. If this number is low, then understanding between-country variation may not be particularly important.

Since there is no agreed-upon level at which cross-group differences become important, I use a point of comparison: international differences in health, specifically self-rated health. It is generally considered to be the case that cross-country differences in health are both large and important to understand (e.g., IHME, 2018), as are within-country differences (e.g., Murray, Kulkarni, Michaud, Tomijima, et al., 2006). Cross-country variation in self-rated health is due both

to cross-cultural differences in expression and to "actual" differences in health (Jurges, 2007). Examples of ICC values found in this field include 0.07 (Richter, Rathman, Gabhainn, Zambon, et al., 2012), 0.09 (Elgar, Davis, Wohl, Trites, et al., 2011), 0.10 (Torsheim, Currie, Boyce, Kalnins, et al. 2004), 0.11 (Story and Glanville, 2019) and 0.14 (Mansyur, Amick, Harrist, & Franzini, 2008). Therefore, I consider any ICC value within the 0.10-0.15 range as indicating "important" cross-country differences.

ICCs for the models at the individual-question level are not given because in a logistic random-intercept model, the individual-level residuals are assumed to follow the standard logistic distribution, which has constant variance 3.29 (Rabe-Hesketh and Skrondal, 2008). Instead, I give standard deviation in country-specific prevalence of a stigmatizing response to each question.

Analysis

— Individual Questions —

Respondents in a given country have a certain likelihood of answering each question in a stigmatizing manner. For each question, Table 3.1 shows the weighted average of these country-specific likelihoods, and the spread of these likelihoods given as the standard deviation.

Looking across questions, there is quite a range in the average likelihood of support across questions. For example, while respondents in a typical country have an 85% chance of saying that they would be unwilling to allow V to take care of their children, they only have a 29% chance of saying that V is not as intelligent as other people.

One can also look across countries within questions. For example, in the case of the "take care of your children" question, countries are somewhat similar to each other. In 95% of countries, between 70% and 100% of people would not want V to take care of their children. On the other hand, countries differ from each other much more in the prevalence of people who believe that V is not as intelligent as other people. The standard deviation in country likelihoods for this question is

23%. Overall, more than half the questions have standard deviations that exceed 15%, indicating that a 30% spread would only cover half of countries' prevalence values for that question.

Table 3.1. Descriptive Statistics For Variation in Country-Specific Prevalence of Stigmatizing Response to Twenty Individual Questions

Stigma Question	Mean	Std. Dev.
Intolerance		
not as intelligent as anyone else	29%	23%
unpredictable	69%	12%
not as productive as most other workers	51%	15%
not as trustworthy as anyone else	47%	19%
makes me feel uncomfortable	32%	11%
makes me feel nervous	39%	11%
hard to talk to	54%	11%
Desire for Social Distance		
unwilling to have as a neighbor	34%	17%
unwilling to have marry someone related to me	69%	15%
unwilling to make friends with	37%	15%
unwilling to work closely with	44%	9%
unwilling to have care for my children	85%	7%
unwilling to spend time socializing with	40%	12%
Role Restriction		
should not be allowed to teach children	63%	15%
should not be allowed to supervise others at work	58%	17%
should not be allowed to hold public office	54%	14%
should not be hired	30%	15%
should not be allowed to have children	32%	18%
Dangerousness		
dangerous to self	76%	9%
dangerous to others	52%	16%
Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)		

Questions that show higher levels of agreement across countries, as indicated by small standard deviations from the mean likelihood, include "unwilling to have care for my child", "unwilling to work closely with", and "dangerous to self". However, one of these is "consistently inconsistent". Specifically, the mean prevalence for "unwilling to work closely with" is 44% with a standard deviation of 9%. This means that on average, half of people in a country agree and half do not, and countries do not differ much from each other in terms of this internal split among their citizens.

"Dangerous to others" is one of the more widely varying responses (sixth most varying): country-specific prevalence has a standard deviation of 16%. A test[2] of whether countries' means differ from each other is statistically significant for every question.

— *Stigma Sub-Scales* —

We have seen that the prevalences of almost all specific stigmatizing beliefs vary significantly from country to country. However, it is possible that these are still only superficial variations. For example, maybe in some countries, people with schizophrenia are widely believed to be unsuitable for public office but not for the private work of raising children, whereas in other countries the situation is reversed. This would lead to wide divergence among countries at the level of individual questions, but not at the level of overall role exclusion. The specific role that a person is prohibited from would vary, but the degree to which they are excluded from full social participation would not. It is this more aggregated level of stigmatization that I consider next by examining cross-country differences in the three stigma sub-scales: intolerance, social distance, and role exclusion.

A person's sub-scale score is the fraction of relevant questions that they answered in a stigmatizing manner, rescaled to range from 0-10. Individual scores have been aggregated (with population weights) into country-level means, shown in Figure 3.1, Figure 3.2, and Figure 3.3. Countries' mean scores on the intolerance, social distance, and role exclusion sub-scales tend to be highly correlated (Table 3.2), with countries that have high levels of public stigma expressed as social distance also having high levels of public stigma expressed as role exclusion and intolerance.

[2] As describe in the methods section, this is a likelihood ratio test that compares the null model to an empty random-intercept model with the odds of giving a stigmatizing response to the question as the outcome. The p-value for the test was 0.000 for every question.

Figure 3.1. Mean Intolerance Score by Country

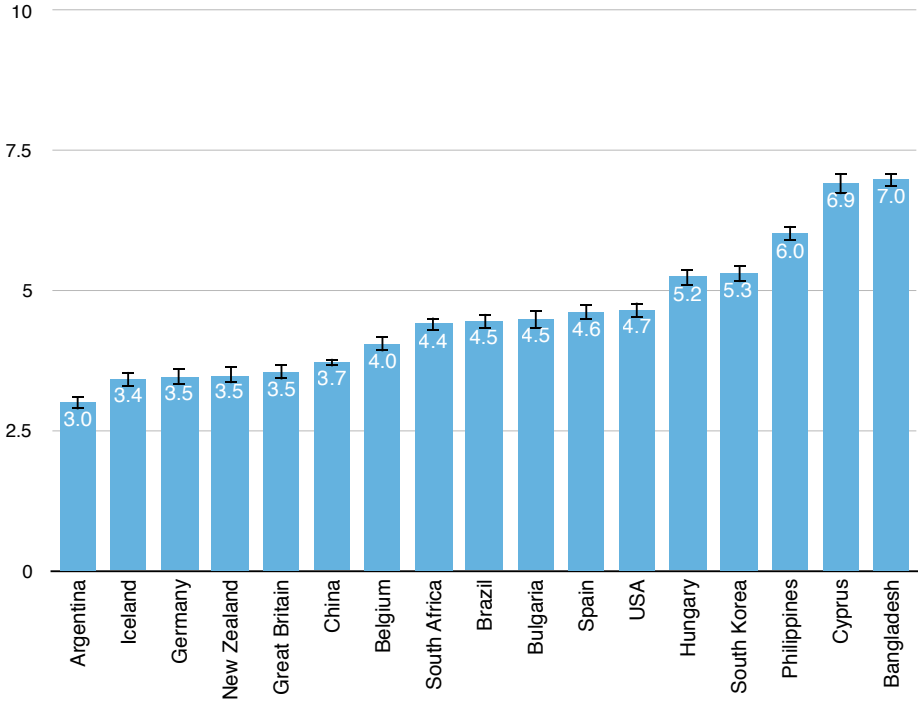


Figure 3.2. Mean Social Distance Score by Country

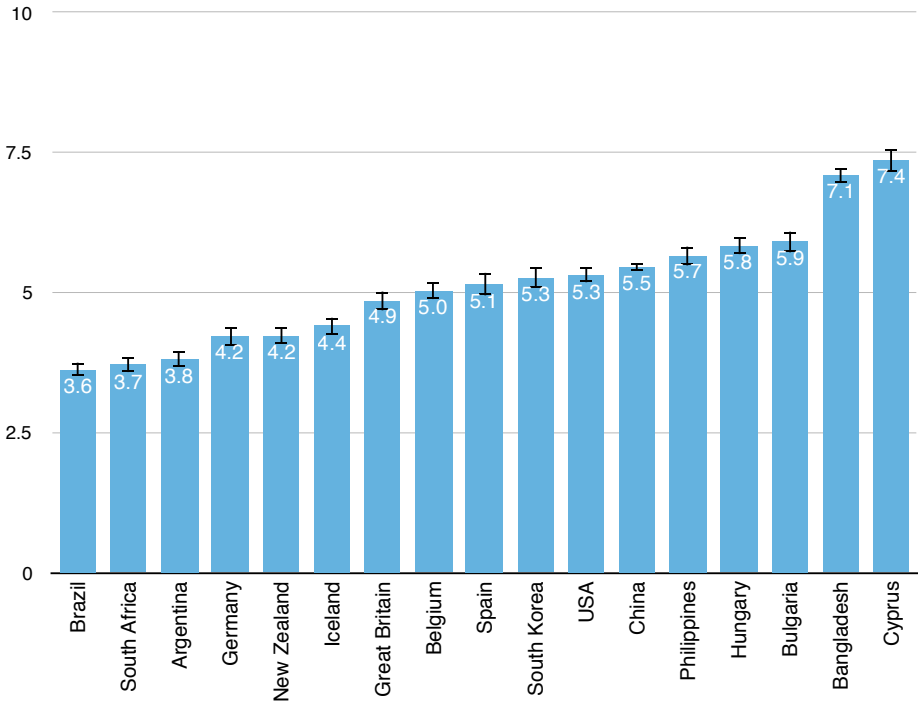


Figure 3.3 Mean Role Exclusion Score by Country

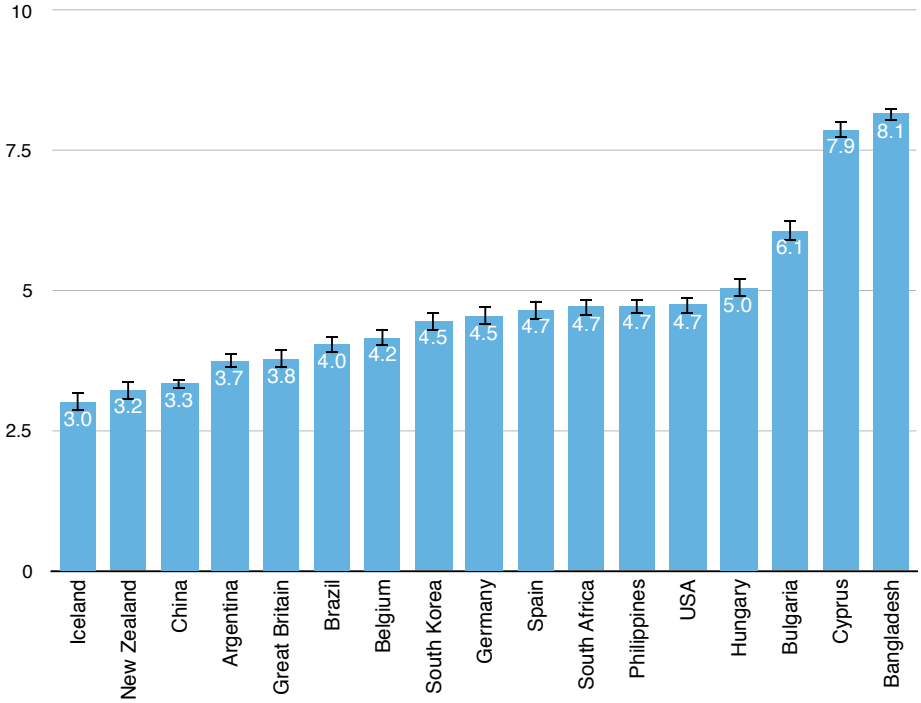


Table 3.2. Correlations Among Countries' Levels of Public Stigma, by Sub-Scale

	Intolerance	Social Distance	Role Exclusion
Intolerance			
Social Distance	0.81		
Role Exclusion	0.85	0.80	
Overall Scale	0.95	0.91	0.94

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

The average of these means and their spread, given as a standard deviation, is shown in Table 3.3 for each sub-scale. Also shown are the results of a test comparing the log likelihoods of the null model and the random-intercept model, and the inter-class correlation coefficients (ICCs) for each random-intercept model.

The spread of country means as indicated by the standard deviation is fairly similar for each sub-scale (1.2, 1.1, and 1.4 for intolerance, desire for social distance, and role exclusion, respectively) as are the means of the country means (4.6, 5.1, and 4.7). Likelihood ratio tests comparing the null

models to the random intercept models confirm that there are statistically significant differences in countries' means scores, for all three sub-scales.

Table 3.3. Descriptive and Model-Based Statistics for Country Means of Stigma Sub-Scales

Sub-Scales (0-10)	Intolerance	Social Distance	Role Exclusion
Descriptive Statistics			
Mean	4.6	5.1	4.7
Standard deviation	1.2	1.1	1.4
Minimum	3.0 (Argentina)	3.6 (Brazil)	3.0 (Iceland)
Maximum	7.0 (Bangladesh)	7.4 (Cyprus)	8.1 (Bangladesh)
Model-Based Statistics			
Log-likelihood test†	$\chi^2(1)$: 8042 p: 0.000	$\chi^2(1)$: 7962 p: 0.000	$\chi^2(1)$: 8509 p: 0.000
ICC††	14%	10%	17%
Between-country	1.32	1.07	1.95
Within-country	7.80	9.94	9.52

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

† Compares the log likelihoods of the null model and the random-intercept model.

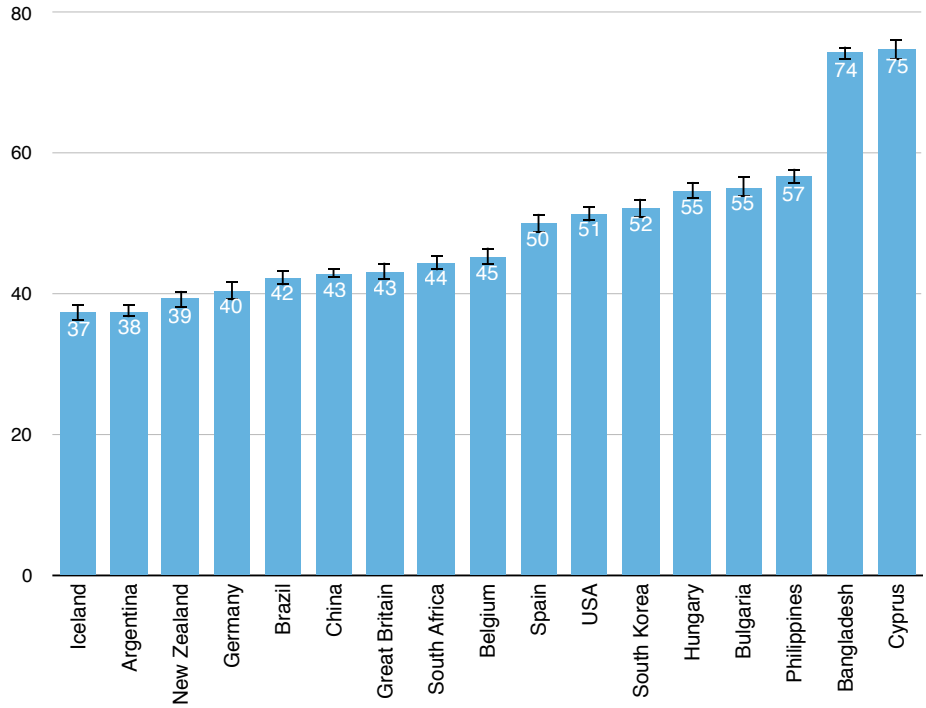
†† Inter-class correlation coefficient: the ratio of the between-country and total variation, derived from the random-intercept model.

However, sub-scales differ rather dramatically in the degree to which clustering explains the total variance. The role exclusion sub-scale has the highest ICC (17%) and intolerance the second-highest (14%). Social distance shows the smallest ICC (10%). It exhibits both the highest within-country variation and the lowest between-country variation, meaning that its relatively lower ICC is a due to the combination of both factors. Nonetheless, all three ICCs meet the standard defined in the methods section for importance in cross-country variation.

— *Overall Stigma Score* —

Countries' levels of public stigma (population-weighted means of their respondents' overall stigma scores) are shown in Figure 3.4.

Figure 3.4. Mean Stigma Score by Country



The mean level of public stigma is 49, and the standard deviation is 11. Thus, it is expected that about half of countries will have levels of public stigma between 38 and 60, but one is expected to have to go as low as 27 and as high as 71 to capture means for 95% of all countries. These are quite large ranges, and suggests that cross-country differences in level of public stigma is an important outcome to be explained.

Of the actual countries surveyed, stigma scores range from 37 to 75, although Cyprus and Bangladesh have noticeably higher average scores than other countries (74 and 75, respectively). In contrast, in Iceland, an average respondent gave a stigmatizing response on 37% of the questions (~ 7 question on the 20 question scale), whereas the average Cyprus respondent gave a stigmatizing response to 75% of the questions (~ 15 question on the 20 question scale). Americans are close to the middle, with an average of 51% of questions (~10 questions) answered in a stigmatizing manner.

The ICC is 118/(118+549) = 0.177, meaning that about 18% of the total variation in stigma scores is between countries. This is at the top of the range of ICC values in cross-country research on self-rated health, identified earlier as indicating important differences across countries. A likelihood ratio test comparing the null model to this random intercept model indicates that this difference is strongly statistically significant ($\chi^2(1)$: 14382, p-value: 0.000).

Explanatory Value of Individuals' Characteristics

Thus, countries do vary significantly on every question and scale detecting stigma in their populations, and this variation is important to explain. The question now is, can the characteristics of the individuals who compose each country's population explain this variation? In other words, do countries' levels of public stigma differ from each other because of the nature of their publics (including their beliefs about schizophrenia), and if so, to what extent is that the case?

Methods: Which Model?

To answer this question, I once again uses multilevel models. Note that the the object of interest is not model coefficients but residual variation, since the objective is to understand "how much has been explained". Specifically, I am interested in how much of the variation in country mean scores has been explained. With a standard regression, this is captured by the R^2. However, R^2 is not usable here because of the necessity for using multilevel models, for which a simple R^2 calculation is not suitable (Hox, Moerbeek, and Van de Schoot, 2010).

Before explaining the correct computation, I first discuss why a multilevel analysis is necessary and which type of multilevel model is appropriate. One reason to use a multilevel analysis, common to all of the analyses in this dissertation, is that observations are not independent since respondents are grouped within countries. An additional reason specific to this chapter is that

the question is explicitly cross-level: how does the prevalence of an individual-level characteristic (e.g., etiological beliefs) affect a group-level characteristic (e.g., country mean stigma scores)?

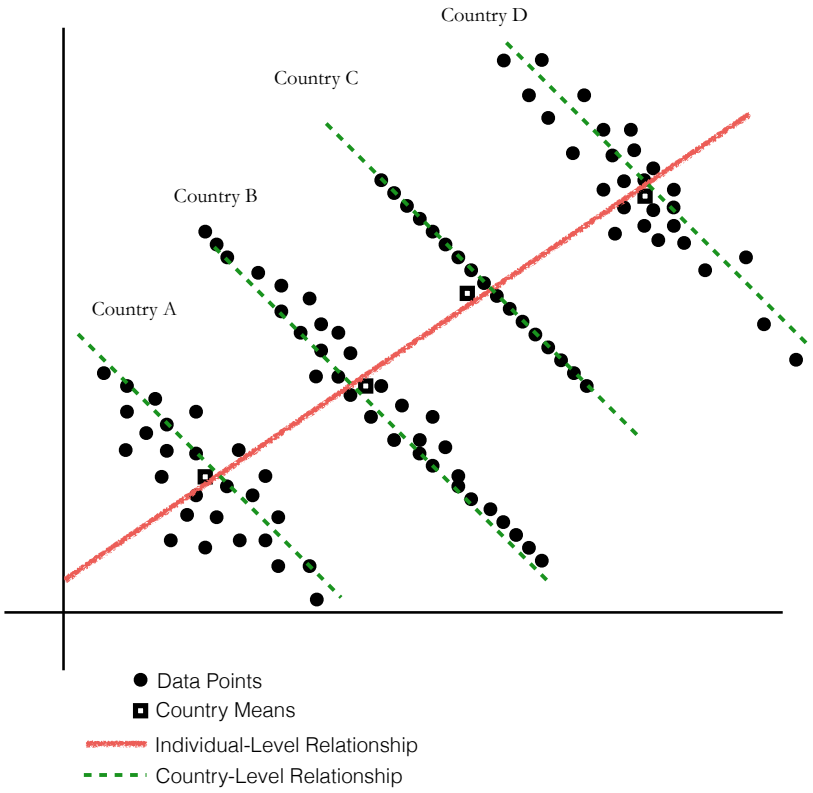
At first glance, the natural approach to answering the question might be to simply put the entire analysis at the group level. One could do this by creating an aggregate variable which would then be a level-2 characteristic, each country's mean prevalence of a given belief, and regressing country mean stigma score on it. This is sometimes called a means-as-outcomes model (Raudenbush and Bryk, 2002).

The reason that this is not appropriate for this question can be understood through the ecological fallacy[3] (Robinson 1950). The ecological fallacy is committed when the relationship at the group level is assumed to apply at the individual level. The same mistake can be made in the other direction, by assuming that a relationship at the individual level applies at the group level (the individualistic fallacy; Alker 1969). For example, it is possible (even in the absence of individual-level confounders) that biogenetic beliefs are associated with higher levels of stigma in individuals and yet for countries with a higher proportion of biogenetic believers to have lower levels of public stigma. The reason a means-as-outcomes model is not appropriate is not because it commits the ecological/individualistic fallacy. Rather, the fact that group-level and individual-level relationships are different means that a cross-level question cannot be answered with an analysis that only considers the group-level relationship.

I give in Figure 3.5 a version of a well-known figure, variants of which can be found in Snijders and Bosker (2003), Raudenbush and Bryk (2002), and Rabe-Hesketh and Skrondal (2008), that shows the problem. The round points are individuals' data points, and the square points are data points for the each country's mean. The green lines are the least-squares fitted slopes at the individual level within each country, the red line is the least-squares fitted slope at the group level.

[3] Wang, Xie, and Fisher (2011) gives a good overview of these points.

Figure 3.5. Hypothetical Data Showing Individual-Level vs. Group-Level Relationships



At the individual level, within a given country, the relationship between x and y is negative. The negative individual-level relationship suggests that, all else being equal, a higher mean x should result in a lower mean y. For this reason, one expects to see that countries with higher mean x's should have lower mean y's. However, the positive-sloped red line shows that the relationship at the group-level is positive: countries with higher mean x's exhibit higher mean y's. If one were to conduct a means-as-outcomes analysis, one would only be detecting this positive relationship, not the negative effect on country means of changing distributions of individuals' x-values. The effect of interest is drowned out by the effect of other characteristics of groups that have not been accounted for.

The same issue is present with respect to the residual variation. As with the effects, the source of the variation explained is not that in which we are explicitly interested. Using the means-

as-outcomes model would give the mistaken impression that nearly 100% of the variation in country mean y's is due to the fact that countries have different distributions of x-values. While these are almost perfectly correlated, that cannot be the real cause, for the same reason that the positive effect at the group-level cannot be caused by the negative effect at the individual-level.

An exclusively within-country model of the type used in Chapter 2, whose coefficient is represented by the negative slope of the green lines, is also not appropriate for the research question. The green lines show how much an individual's y-value is affected by a change in x, but not how changes in individual's x-values affect each country's mean y-value (the cross-level question). They also cannot explain any of the cross-country variation, since they do not exhibit any cross-country variation (they are parallel in this figure).

What does vary from country to country and is necessary to explain variation in country means is the distribution of y values in each country, summarized by the country mean x. We have already seen an example of how this works in Chapter 2. I showed that blaming increases stigma scores of individuals by an average of 3.6 points. The expected effect of changing everyone to a non-blamer is not, however, to decrease all countries' mean stigma scores by 3.6 points. This is because some people (with the proportion varying from country to country) are already non-blamers. The way that means would change (and how close they would get to each other) if all countries had the same proportion of blamers is dependent on countries' current proportions. Models that only estimate within-country effects have no access to this distribution information.

Fortunately, the solution is simple: provide the model with the missing distribution information. Recall that in Chapter 2, predictor variables were group-mean centered in order to obtain interpretable model coefficients. When predictors are not group-mean centered, model coefficients are an uninterpretable combination of the within-group and across-group effects

(Raudenbush and Bryk, 2002). But, by group-mean centering, the distribution information[4] was effectively excluded from the model. The solution is therefore to refrain from group-mean centering the predictors. This will result in uninterpretable coefficients, but since for this question we are only interested in residual variances, that is not a problem.

Recall that multilevel models separate out the level-1 (individual-level, within-country) variation from the level-2 (group-level, between-country) variation. While the inclusion of group-mean centered level-1 variables results only in a reduction in level-1 variation, the inclusion of non-centered level-1 variables will result in a reduction in both level-1 and level-2 variation. Level-1 variation is reduced because the differences between individuals in terms of whether they hold a given belief explains some of the reason why compatriots' stigma scores differ from each other. The reduction in level-2 variation will be the result of "the unequal composition of groups" (Hox, Moerbeek, and Van de Schoot, 2010), the fact that countries have different belief prevalences. This reduction in level-2 variation is exactly what we are interested in, since it represents the extent to which beliefs[5] (the level-1 variables) explain differences in country means (the level-2 variation in the outcome).

Methods: Calculating Variation Explained

Raudenbush and Bryk (2002) provide a formula to quantify the reduction in level-2 variation that is attributable to a level-1 variable: the difference in residual level-2 variation between models that do and do not include that variable, divided by the total level-2 variation. The total level-2 variation is the original observed variation in mean stigma scores, obtainable from the empty model.

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[4] In this case, the distribution is represented by the country means. Distributions can be represented in other ways (Goldstein, 2011).

[5] "Beliefs" here includes both the holding of the belief by individuals and the prevalence of the belief in the country.

An alternative formula is given by Snijders and Bosker (1994). The Snijders-Bosker formula is the change in the level-2 mean squared prediction error from the model with the variable from the model without it, divided by the without-model's mean squared prediction error. The mean squared prediction error for a given model is estimated as the level-2 residual variation plus the quotient of the total level-1 residual variation and the mean group size. Because the Raudenbush and Bryk formula is most widely used (Wang, Xie, and Fisher, 2011) and is more intuitive, it is the one I use here.

Methods: Predictor Variables

The work from Chapter 2 informs the choice of level-1 predictor variables for this section. Recall that only beliefs that have stigma effects and which differ in prevalence from country to country are possible explainers of variation in countries' levels of public stigma. The Chapter 2 literature review elicited a set of possibilities, and the analysis showed which of these beliefs were associated with higher stigma scores among individuals. It was determined that etiological beliefs (B, BP, P, or nBP), blaming, and prognostic pessimism had independent and statistically significant effects on individuals' stigma scores. The specific measures and their variation in prevalence from country to country were described in Chapter 2.

As before, it is necessary to control for socio-demographics and contact experience in order to isolate the role of beliefs. However, these characteristics are of independent interest as well, and their respective contributions to level-2 variation are therefore also explored.

To ensure comparability of residual variances across nested models, the sample is limited to those respondents who have data for all variables used in any of the models being compared. This reduces the size of the subsample from 8,382 to 5,818. A breakdown of the exclusions is shown in Table 3.4. It will be noted that requiring respondents to have blaming data is responsible for most of the reduction in the size of the sub-population. For completeness, I nonetheless include blame

as a level-1 variable. Results are similar regardless of whether or not respondents with missing blame information are included.

Table 3.4. Count and Percentage of All Respondents With Missing Data, by Level-1 Variable		
Original Sample Size	*8,382*	*100%*
Stigma Score/Sub-Scores	120	1%
Demographics	382	5%
Contact	121	1%
Etiology	235	3%
Prognosis	86	1%
Blaming	2,161	26%
Resulting Sub-Population Size	*5,818*	*69%*
Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)		

Methods: Varying Effect Sizes

In the explanation given above, the implicit assumption has been that there is a single individual-level effect for a given belief (e.g., the typical effect of prognostic pessimism on a person's stigma score is the same in Bulgaria as it is in the Philippines). In other words, I have been discussing multilevel models of the random-intercept-fixed-effect type. Under this assumption, the interpretation of the level-2 variance explained would be that differences in the prevalence of belief X from country to country explain Y% of the variation in countries' levels of public stigma.

However, it was shown in Chapter 2 that for some beliefs, individual-level effects do not appear to be the same in all countries. In the case of etiological beliefs and blame, effect sizes are statistically significantly different in developed and developing countries (this was not the case for prognostic pessimism). Therefore, I include an interaction with country development status, a level-2 characteristic, to account for the fact that effect sizes differ in the two contexts. The interpretation of the level-2 variance explained under such a model is: taking into account the fact that belief effects differ by development context, differences in the prevalence of belief X explain Y% of the variation in levels of public stigma. Alternatively, differences in the prevalence of belief

X and also in the fact that it affects stigma differently in one development context than another together explain Y% of the variation in levels of public stigma.

One might notice from Chapter 2 that differentiating by development status does not explain all of the variation in effect sizes from country to country for either etiological beliefs or blame, and ask whether it is possible to produce a computation of level-2 variance explained that takes all of the variation in effect sizes into account, not just that which is related to development status.

The answer is that it is possible, but may not be desirable. A model that allows beliefs to have a country-specific effect would be of the random-intercept-random-slopes type. This type of model would account for the variation in beliefs effects from country to country since it explicitly includes them. However, especially under conditions where the variation is not large, there is no guarantee that this would be a "more correct" computation. One expects some degree of variation in the repeated measurement of an effect (i.e., when the effect size is measured in different countries) even if there is in fact only one effect size. In other words, it is almost certainly the case that some of the variance observed is due to measurement error, rather than reflecting genuine differences among countries.

Despite this, one might argue for using random effects in this context because including them would maximize variation explained, and thus give the benefit to the existing strong focus in the literature on individual-level effects. In that sense, using random effects would be the more conservative choice. However, precedent is against it. Snijders and Bosker (2003) and Wang, Xie, and Fisher (2011) state that researchers typically treat effects as fixed for the purposes of computing variation explained.

They give three reasons for this. First, when random effects are introduced, the variance explained computation becomes very involved (Snijders and Bosker, 1994; Snijders and Bosker, 2003). Second, the sizes of the residual variances are affected by the scale of the predictors when

there are random effects, and there is no definitive solution to this problem[6] (Hox 2002; Wang, Xie, and Fisher, 2011). Third, the difference in residual variances that results from choosing random effects over fixed effects tends to be quite small.

I tested the relevance of this third point to the models at hand by comparing fixed- and random-effect versions of a model with overall stigma score as the outcome that controlled for demographics and contact. The fixed effects models tested included interactions with development status for etiological beliefs and blame. Residual level-2 variances in country mean stigma scores were 0.3% lower when etiological belief effects were allowed to vary randomly than when they were left as fixed, 1.7% lower when the blame effect was allowed to vary randomly, and 1.1% higher when the prognostic pessimism effect was allowed to vary randomly. These values are consistent with the claim that residual variances of random effects models tend to differ only slightly from those of fixed effects models. For these reasons, I have chosen to use fixed-effects models in the sections that follow.

Methods: Analysis Plan

The analysis proceeds in two parts. In the first part, the outcome variable of the nested models is overall stigma score. In the second part, the outcome variables are the three "dimensions" of stigma, given by the stigma sub-scores. This allows for an interesting comparison of the similarities and differences among the sub-scores and prepares the ground for the work in Chapter 4.

In each case the process is that a sequence of nested models involving various individual-level variables is run. Based on the level-2 variations in successive models, the Raudenbush and

[6] However, there is a recommended strategy, which is to grand-mean center any level-1 variables that have random slopes on the theory that the resulting variation would therefore be reflective of an "average" sample (Hox 2002, pg. 64).

Bryk formula is used to compute the amount of variance explained by the unequal prevalences of the individual characteristics and beliefs from country to country.

The nested models have been run in an order that reflects the theoretical position on causality outlined in Chapter 2. Specifically, demographics and contact experience are treated as things to be controlled for in order to accurately assess the effect of beliefs. As a result, they appear as variables in all non-base models. Prognostic pessimism and blaming have been hypothesized as mechanisms (although rather minor ones, as shown in Chapter 2) by which etiological beliefs result in lower stigma scores. This means that choosing to control for them would result in an underestimate of etiological belief effects, and so has not been done where I am attempting to isolate the role of each belief separately.

I also control for vignette person characteristics in all models, including the base ("empty") model. If vignette person characteristics are not controlled for, country sub-populations will be different simply by virtue of the fact that the randomly excluded respondents could create unbalanced populations with respect to the vignette characteristics. In this case, some additional variation will result from the fact that populations are no longer balanced by vignette person characteristics (whereas in the original sample, exactly one quarter of respondents in each country respond to a male-majority vignette, one quarter to a female-minority vignette, etc.). This additional variation will reflect not a different in country populations, but a difference in whom populations tended to be asked about. This methodologically introduced variation is therefore excluded by treating the model that controls only for vignette person characteristics as the "empty" or base model.

Analysis

— *Overall Stigma Score* —

Table 3.5 shows the series of nested fixed-effects multilevel models with stigma score as the outcome and using grand-mean centered level-1 predictor variables. The coefficients for models with non-group-centered predictors are difficult to interpret because they represent a combination of level-1 and level-2 effects, and since they are not relevant to the analysis question they are not shown. The individual-level effects can be found in Chapter 2.

Table 3.5. Fraction of Between-Country Variation Explained by Demographic Characteristics, Contact Experience, and Beliefs, Based on Random-Coefficient, Fixed-Effects Multilevel Models

Model Description	Base Model (1)	Demo-graphics (2)	Contact (3)	Etiology (4)	Prognosis (5)	Blame (6)	All Beliefs (7)
Vignette Person Demographics							
Gender	x	*x*	*x*	*x*	*x*	*x*	*x*
Race (majority/minority)	x	*x*	*x*	*x*	*x*	*x*	*x*
Respondent Demographics							
Gender		*x*	*x*	*x*	*x*	*x*	*x*
Race (majority/minority)		*x*	*x*	*x*	*x*	*x*	*x*
Age (years)		*x*	*x*	*x*	*x*	*x*	*x*
Education (years)		*x*	*x*	*x*	*x*	*x*	*x*
Contact							
Ever known someone MI			*x*	*x*	*x*	*x*	*x*
Ever been diagnosed MI			*x*	*x*	*x*	*x*	*x*
Beliefs							
Etiological beliefs (B, BP, P, nBP)†				*x*			*x*
Prognostic pessimism					*x*		*x*
Blaming†						*x*	*x*
Residual Variation							
Within-country variation	518	511	506	490	503	503	484
Between-country variation	127	124	113	105	109	111	97
Between-Country Variation Explained††							
% Explained		2.3%	8.5%	6.0%	3.4%	1.4%	12.2%
Computation		(2)-(1) / (1)	(3)-(2) / (1)	(4)-(3) / (1)	(5)-(3) / (1)	(6)-(3) / (1)	(7)-(3) / (1)

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

An *x* indicates that the variable was included in the model.

All models use the same sub-sample (observations: 5,818, countries: 17), which has been limited to those respondents with complete information for all variables. This ensures comparability across models.

† Includes interaction with country development status.

†† Method for computing the proportion of level-2 variance explained is from Raudenbush and Bryk (2002).

I start with the base random-intercept model, which separates variation in stigma scores into a within-country (level-1) component and a between-country (level-2) component. The interclass correlation coefficient that results is 127/(127+518) = 0.196, meaning that 19.6% of the total variation in stigma scores among respondents is due to the fact that they are from different countries[7]. It illustrates that differences between the countries in which they reside are quite an important factor in why a given person might have a higher stigma score than someone else. Some of this difference will be attributable to the fact that people from different countries tend to differ from each other (i.e., in their age, or their tendency to hold a given belief about mental illness), and some of it will be due to the fact that the context in which that person lives is different (i.e., something about that country's culture or society creates a different stigma environment). The point of this section is to untangle these components and give a quantification of what the former can explain.

When age, gender, education, and race of respondents are included in the model (Model 2 vs. Model 1), the residual variation at level-2 decreases from 127 to 124, which is 2.5% of the total level-2 variation. In other words, if all countries had the same demographic distributions, such as the same age structure, then one would expect that countries' levels of public stigma would be only a little more similar to each than they are now.

Differences in contact experience are more impactful. Variation in the prevalence of contact experience among countries' populations is responsible for 8.5% of the variation in levels of public stigma among countries (Model 3). Phrased differently, if every person in every country had the same likelihood of having had contact with a person with a mental illness, the variation in country mean stigma scores is expected be 8.5% smaller than it is now.

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[7] This value is different than was found in the earlier section with the same model because the population has changed. In this case, it is limited to those who have complete data, whereas previously all respondents were included.

Etiological beliefs (Model 4) account for 6.0% of the variation in country mean stigma scores. Prognostic pessimism (Model 5) and blaming (Model 6) explain 3.4% and 1.4 % of the level-2 variation, respectively. Cumulatively (Model 7), individuals' beliefs about V's illness (etiological, prognostic, and blame-related) explain 12.2% of the variation in country mean stigma scores.

Some key observation follow. First, variation in all individual characteristics taken together have a non-trivial ability to explain why countries' mean stigma scores vary. Comparing Model 7 to Model 1 shows that almost a quarter of the level-2 variation ((127-97)/127) ≈ ~24%) can be explained by differences in the composition of populations. However, differences in belief compositions explain only half of this (~12%). Furthermore, differences in etiological beliefs explain a mere 6% of the variation: even an entirely successful effort to evangelize the "medically uninformed" would likely reduce the spread among countries by a very small amount. The single-most powerful reason (at the individual level) for differences in levels of public stigma among countries is that people in some countries are more likely to have had contact with a person with mental illness. However, some of this apparent effectiveness may be due to reverse causality. It is likely that in countries where stigma is less virulent, a person is more likely to be aware of the fact, and hence to report in this survey, that they know a person with mental illness. Prognostic pessimism likely has such a limited explanatory value because prognostic beliefs are quite uniform across countries. Blaming is practically irrelevant to stigma differences across countries, having even less explanatory value than demographic differences. I also note that development status explains almost nothing about differences in average stigma score across countries. The inclusion of development status, a level-2 explanatory variable, into the base model reduces level-2 variation from 126.79237 to 126.58451 (not shown), a reduction of less than 0.2%.

— Stigma Sub-Scores —

Now I turn to the stigma sub-scores. Each of the three sub-scores (intolerance, desire for social distance, and role exclusion) was considered separately in the same manner as the overall stigma score. The set of models is described in Table 3.6. Also given are the residual level-1 and level-2 variations from each model. Table 3.7 uses the level-2 variations from Table 3.6 to obtain the estimated percentage of variation explained.

Table 3.6. Residual Variances Associated with Multilevel Random-Intercept Models Having One of Three Sub-Scale Scores (Intolerance, Social Distance, or Role Exclusion) as Output

Model Description	Base Model (1)	Demo-graphics (2)	Contact (3)	Etiologies (4)	Prognostic Pessimism (5)	Blaming (6)	All Beliefs (7)
Vignette Person Demographics							
Gender	x	*x*	*x*	*x*	*x*	*x*	*x*
Race (majority/minority)	x	*x*	*x*	*x*	*x*	*x*	*x*
Respondent Demographics							
Gender		*x*	*x*	*x*	*x*	*x*	*x*
Race (majority/minority)		*x*	*x*	*x*	*x*	*x*	*x*
Age (years)		*x*	*x*	*x*	*x*	*x*	*x*
Education (years)		*x*	*x*	*x*	*x*	*x*	*x*
Contact							
Ever known someone MI			*x*	*x*	*x*	*x*	*x*
Ever been diagnosed MI			*x*	*x*	*x*	*x*	*x*
Beliefs							
Etiological beliefs (B, BP, P, nBP)†				*x*			*x*
Prognostic pessimism					*x*		*x*
Blaming†						*x*	*x*
Residual Variation							
Intolerance							
Within-country	7.40	7.29	7.25	7.10	7.21	7.23	7.03
Between-country	1.48	1.42	1.32	1.24	1.27	1.29	1.16
Social Distance							
Within-country	9.52	9.41	9.31	9.20	9.26	9.24	9.07
Between-country	1.13	1.05	0.91	0.86	0.87	0.87	0.79
Role Exclusion							
Within-country	9.45	9.25	9.18	9.00	9.15	9.17	8.96
Between-country	2.02	1.95	1.83	1.70	1.77	1.78	1.57

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

An *x* indicates that the variable was included in the model.

To enable comparability, all models use the same sub-sample (observations: 5,818, countries: 17), which has been limited to those respondents with complete information for all variables.

† Includes interaction with country development status.

Table 3.7. Percent Reduction in Level-2 Variation Due to Demographics, Contact Experience, and Beliefs, for Each Stigma Sub-Scale

Sub-Scale	Demo-graphics	Contact Experience	Etiological Beliefs	Prognostic Pessimism	Blaming	All Beliefs
Intolerance	3.9%	6.9%	4.8%	3.3%	1.5%	10.7%
Social Distance	6.9%	12.7%	4.5%	3.5%	3.3%	10.4%
Role Exclusion	3.3%	6.4%	6.2%	2.6%	2.3%	12.6%
Computation†	(1)-(2) / (1)	(2)-(3) / (1)	(3)-(4) / (1)	(3)-(5) / (1)	(3)-(6) / (1)	(3)-(7) / (1)

Source: Stigma in Global Context - Mental Health Survey (SGC-MHS)

† Numbers indicated refer to the level-2 variances associated with the given model number from Table 3.6. Method for computing the proportion of level-2 variance explained is from Raudenbush and Bryk (2002).

As with the overall stigma score, inter-class correlation coefficients are similar but slightly higher with this subset of the population than with the whole population (0.167 for intolerance, 0.107 for social distance, and 0.176 for role exclusion).

Differences in the prevalences of all individual-level characteristics (demographics, contact experience, and beliefs) explain a fairly large proportion of cross-country variation for all three sub-scores. However, it is apparent that there is notable variation among sub-scales in the extent to which that is the case. More specifically, while the explanatory value for role exclusion (22.2%) and intolerance (21.5%) are quite similar, the explanatory value of individual characteristics for level-2 variation in social distance score is much higher (30.0%).

These cross-scale differences are primarily due to the larger explanatory values of demographics and contact with respect to the social distance sub-scale. The fraction explained by beliefs alone is quite similar for all three sub-scales (10.7%, 10.4%, and 12.6% for intolerance, social distance, and role exclusion respectively). Demographic differences have about double the explanatory value for social distance level-2 variation as they do for level-2 variation in the other two sub-scales (6.9%, vs. 3.9% for intolerance and 3.3% for role exclusion)[8]. Even more pronounced is

[8] Sub-scores also vary by which of the demographic characteristics has the highest explanatory value. In the case of intolerance and role exclusion, the majority of the demographic explanatory value is from education differences, whereas for social distance, it is from race.

the outsized explanatory value of contact experience for level-2 variation in desire for social distance (12.6%). Not only is this nearly double the values it has for intolerance (6.9%) and for role exclusion (6.4%), but it is also the single-most important factor represented in the table.

The within-scale relative importance of contact and beliefs is also notable. In the cases of intolerance and role exclusion, beliefs tend to outweigh contact experience in explanatory value (10.7% vs. 6.9% in the case of intolerance, and 12.6% vs. 6.4% in the case of role exclusion). However, for social distance, contact is a more important factor than are all beliefs combined (12.7% vs. 10.4%).

Looking within the set of all beliefs, the relative contributions of etiologies, prognostic pessimism, and blaming also show differences across sub-scales, but these differences tend to be more muted. The rather small contribution of etiological beliefs to overall stigma scale level-2 variation that was found earlier is mirrored in each of the three sub-scales: 4.4% for social distance, 4.8% for intolerance, and 6.2% for role exclusion. The fact that people in some countries more frequently tend to believe in a biogenetic explanation for mental illness while in others they tend more frequently to believe in a psychosocial explanation, for example, explains very little about why these countries have different average stigma sub-scores, and this is true regardless of which facet or dimension of stigma is considered. The fact that differences in contact experience explain almost three times as much social distance variation as differences in etiological beliefs is a key finding.

Across all three sub-scales, prognostic pessimism and blaming have low levels of explanatory value. The explanatory value of blaming is particularly limited for all three sub-scales, but is especially so in the case of the intolerance sub-scale, where it has half the impact of prognostic pessimism. One reason for this might be that role exclusion and social distancing might have a more of a moralistic component than intolerance. Both social distancing and role restriction can be used as a form of punishment against a guilty person. This seems less likely to be the case for

intolerance: thinking poorly of a person's intrinsic abilities or feeling uncomfortable around them, for example, are generally not punitive responses.

Conclusion

At present, very few studies have given a quantification of how much public stigma varies from country to country. This chapter has assessed cross-countries differences in level of public stigma by comparing countries' means at three levels of aggregation: individual question, sub-scales, and overall stigma score.

The prevalence of stigmatizing responses to specific questions tends to be fairly large. Overall, more than half the questions have standard deviations that exceed 15%, indicating that a 30% spread would only cover half of countries' prevalence values for that question. There are a few questions that show a higher level of agreement across countries: "unwilling to have care for my child", "unwilling to work closely with", and "dangerous to self".

When the 20 individual questions are rolled up into the overall stigma score, countries tend to differ from one another quite significantly. Based on the countries in this sample, it is expected that for the entire population of countries, stigma scores would range from 27 to 71 (to capture 95% of countries), with half of their mean stigma scores lying between 38 and 60. To put this in context, the average person from the 60-score country will answer an additional 20% of the survey in a stigmatizing manner compared to the average person from the 38-score country.

About 18% of the variation in individuals' stigma scores is due to the fact that they are clustered into countries. In contrast, about 10-15% of the variation in self-rated health is due to clustering. Taken together, these results suggest that cross-country variation in mean stigma scores is large and important to understand.

I also find that clustering explains the most about role exclusion sub-score variation and least about social distance sub-score variation. The standard deviation in country means for social

distance is smaller than for the other two sub-scales, and highest for role exclusion. These results imply that degree of desire for social distance is more consistent across countries than degree of intolerance or role exclusion.

Overall, the conclusion is that countries' stigma scores differ significantly from each other at every level of measurement. There is great variety in the frequency with which specific questions receive a stigmatizing responses, in the average intolerance, social distance, and role exclusions scores, and in mean overall stigma score (level of public stigma). These differences are numerically large, and an important fraction of the total variation is due to these country differences. This was shown by the ICC analyses, which indicated that country clustering explains as much or more of the variation in stigma scores and sub-scores as it does variation in self-rated health.

Given that cross-country differences are important, what can be offered to explain them? One possibility is that it is the fact that countries' populations differ in their makeup is what generates these differences. For example, I showed in Chapter 2 that biogenetic etiological beliefs are associated with higher stigma scores. I also showed that the fraction of the population holding biogenetic beliefs tends to vary quite a lot from country to country. This chapter considers to what extent differences of this kind can explain why countries' levels of public stigma differ.

The analysis showed that about 6% of the variation in levels of public stigma from country to country can be explained by the fact that the distribution of etiological beliefs within them differs. This is quite small, and does not tend to support the claim that it is important for people in other countries to learn to adopt a medical view of schizophrenia. Prognostic beliefs and blaming differences explain very little, in the former case primarily due to the fact that there is so little variation in prognostic beliefs as measured in this survey. The single strongest explainer is contact experience (8.4%).

Looking at the sub-scales rather than the overall stigma score changes the picture only slightly. The most notable difference among sub-scales is that demographics and contact experience

variation have a much stronger explanatory value for mean social distance variation than for variation in the means of the other two sub-scales. Together they explain almost 20% of the variation in country mean social distance scores.

The main conclusion is that the distribution of particular individual characteristics within a population cumulatively are an important part of why countries have different levels of public stigma. However, the role of particular beliefs is quite small. This is true for all three aspects of stigma as represented by the sub-scores, and especially so for desire for social distance. The most important thing seems to be contact experience. However, contact experience is also most open to the claim of reverse causation. It is quite possible that instead of more prevalent contact experience explaining lower country mean stigma scores, lower levels of public stigma explain more prevalent contact experience. This might be because in a country where public stigma tends to be lower, people are more open about their mental illnesses, and so others are more likely to know about them and report that knowledge as contact experience in this survey. And conversely, where public stigma is high, it will be concealed. For this reason, I do not think that the main conclusion is the importance of contact experience, but rather the limited importance of variation in beliefs, especially etiological beliefs. Given the immense focus on etiological beliefs in literature and activism, it is notable how very little countries' stigma landscapes would come to resemble each other even if people in every country had the same distributions of beliefs about schizophrenia.

Chapter 4. Economic Structure and Levels of Public Stigma

Chapters 2 and 3 have been concerned exclusively with how individuals' characteristics and their beliefs about schizophrenia are related to stigma. Chapter 2 covered the relationship at the individual level, comparing the stigma scores of otherwise similar individuals who differ in a given belief. Chapter 3 addressed the relationship at the country level, asking how much of the differences in levels of public stigma from country to country are due to the differing prevalences of particular stigma-related beliefs in their populations. So, even though Chapter 3 joins the very small number of studies that takes countries rather than individuals as its unit of analysis, the analysis is fundamentally predicated on the idea that it is the beliefs held by individuals that explain stigma differences and that these differences "roll up" to create country differences.

Historically, individuals have been a main focus in the literature. More recent theoretical advances have generated new directions that are more concerned with structures. Probably the most prominent theoretical update of the stigma concept since Goffman has been from Link and Phelan (2001). Their theory identifies stigma as a five-part concept: stigma happens when "elements of labeling, stereotyping, separation, status loss, and discrimination co-occur in a power situation that allows the components of stigma to unfold" (p. 367). Related work by Parker and Aggleton (2003), Pescosolido, Martin, Lang, and Olafsdottir (2008), and Link and Phelan (2014) have largely continued the emphasis on macro-level structures as generating power positions from which stigmatization can be practiced. Most applied work regarding social structures follows quite naturally from these theories; anywhere that power differentials exist should be a place where scholars look for the enactment of stigma. Social-structural research has usually examined how medical practices (Pollack, 2004; Kelly, 2006; Lee, Chiu, Tsang, Chui, and Kleinman, 2006; Suto, Livingston, Hole, Lapsley, et al., 2012; Thornicroft, 2013), laws and government policies (Corrigan, Watson, Heyrman, Warpinski, et al. 2005; Hemmens, Miller, Burton, and Milner, 2002; Cummings,

Lucas, and Druss, 2013), or media depictions (Klin and Lemish, 2008; Manago, Pescosolido, and Olafsdottir, 2019; Angermeyer and Matschinger, 1995) enact discrimination or reinforce stigmatization[1].

It can be observed that much of this literature is concerned with power, domination, oppression, and social control. For several authors, stigma seems to be structural only in that sense that macro-level institutions are enacting or enabling it (Cook, Purdie-Vaughns, Meyer, and Busch, 2004; Corrigan and Fong, 2014). This is accordance with the dominant theories as described above, but may be limiting. It mostly fits under the rubric of "structural discrimination" (Corrigan, Markowitz, and Watson, 2004), but usually does not go beyond this. Bonnington and Rose (2014) offer a critique: "there is perhaps a need to consider more fully the effects on stigmatisation from multiple structural elements such as social roles, social positions, institutions, and the systemic relations between them, alongside their intertwining with cultural/ideational forms" (pg. 8).

Over the course of the last twenty years, there has been a general sense of dissatisfaction with this state of affairs. Pescosolido, Martin, Lang, and Olafsdottir (2008) note that "we know relatively little about the sources of stigmatizing attitudes", but add that the roots are to be found across levels of analysis in whatever element of social life "helps shape the norms that mark differences" (p. 432-433). Drawing on Bourdieu and Foucault, Parker and Aggleton (2003) conclude that stigmatization and discrimination are phenomena "inherently linked to the production and reproduction of structural inequalities" (p. 19), but also that almost no literature on stigma (in their case, HIV/AIDS stigma) has dealt with this. Bonnington and Rose (2014) suggest more research that recognizes the importance of the "socio-cultural structural context" (p. 10). Scambler (2004) states the need for more work that "properly appreciate[s] the role of the economy and state, and

[1] There is also a related section of the literature on coping and resistance that explains how the stigmatized strategically resist that power (e.g., Hansen, Bourgois, and Drucker 2014, Thoits 2011), and a part of the literature on intersectionality that deals with how occupying overlapping positions of disadvantage (one of which is belonging to a stigmatized group) impact stigma (see Turan et al. 2019 for a review).

their respective steering media of money and power, in the production of stigma" (p. 38). Like Bonnington and Rose, he points to social systems being the context in which stigma unfolds, but also to the possibility that stigma may be a less important logic in a given setting, and that these other logics and structures may have causal effects on stigma. In his model, stigma may be a part of a given setting, but it coexists there with other "logics" (e.g., patriarchy, capitalism), part of a "nexus of structures" (2006, p. 294) that interact with each other.

Although later work has since moved away from it, one of the foundational ideas in the field of mental illness stigma seems to have satisfied these calls. It related social structures, roles, and culture to stigma variation. Specifically, a series of international studies (International Pilot Study of Schizophrenia (IPSS), the Determinants of Outcome of Severe Mental Disorder (DOSMeD), and the International Study of Schizophrenia (ISoS)) observed that people with schizophrenia in developing countries tended to have "better outcomes" than people with schizophrenia in developed countries (WHO 1973, WHO 1979, Jablensky et al. 1992, Leff et al., 1992, Sartorius et al. 1996, Hopper and Wanderling 2000, Kulhara and Chakrabarti 2001, Harrison et al. 2001). The most prominent explanation was that in developing countries, people with schizophrenia were subjected to less stigmatization and social exclusion which in turn influenced their ability to recover (Murphy and Raman 1971; Waxler 1977, 1979; Warner 1985; Hopper & Wanderling, 2000; Warner is especially interesting here because he discusses work). Lower levels of stigma were attributed to more cohesive societies, family structures that encourage acceptance, and higher levels of social support (Cooper and Sartorius 1977, Waxler 1977, El-Islam 1979). Pescosolido et al. (2015) summarize others' perception of developing countries as oriented toward "tolerance, inclusion, and support for collective assistance" (pg. 7). As countries become increasingly urbanized and industrialized, these orientations weaken, leading to increased stigma and worse outcomes (Cooper and Sartorius, 1977).

The core finding of a difference in outcomes by country development status has been debated (Cohen, Patel, Thara, & Gureje, 2008; Edgerton and Cohen, 1994; Patel, Cohen, Thara, and Gureje, 2006), and few have directly examined the sub-claim that development or other aspects of economies influence stigma levels in countries. Pescosolido et al. (2015) recently did so using GDP per person as a measure of development and found little evidence of a relationship between it and stigma. So, despite early promise in relating economic conditions and stigma, conclusions remain limited and studies are very scarce.

This chapter also relates economic conditions to stigma, but starts with a different set of premises regarding both stigma and what is important about economies for stigma. I explain them in the sections that follow.

Stigma

As per Chapter 1, I start with an understanding of stigma as related to "what matters most" (Yang, Kleinman, Link, Phelan, et al., 2007). Yang and colleagues view the act of stigmatizing as a "highly pragmatic, even tactical response to perceived threats, real dangers, and fear of the unknown" (p. 1528), and observe that "for the stigmatizer, stigma seems to be an effective and natural response, emergent not only as an act of self-preservation or psychological defense, but also in the existential and moral experience that one is being threatened" (pg. 1528). In referring to the sense of being threatened, they are not talking about specific stereotypes of dangerousness or violent tendencies that are often associated with mental illness. Yang, Chen, Sia, Lam, et al. (2014) explain:

> "Remaining a fully-viable member of a local cultural group entails engaging in social exchanges linked to crafting a moral life. […] both the stigmatizers and the stigmatized defend against stigma by acting to preserve their capacity to engage in activities that define what constitutes being a moral person."

(pg. 85-86). Referring to Kleinman's (1999, 2006) work, Yang draws upon the concept of local moral worlds, in which "everyday social life revolves around the pursuit or preservation of fundamental lived values that "matter most" (e.g., religious experience, helping others, achieving status, money, life chances, health, good fortune, a job, or relationships) to ordinary individuals" (Yang et al., 2014, pg. 85).

Yang et. al (2007) give the example of stigma from family members for those with mental illness in China. They describe how a person in China is not only themselves as an individual, but also part of a family structure that stretches forward and backward in time. The necessity of preserving and promoting this structure is seen as the responsibility of every person in it (doing this is "what matters most"). This chain is threatened by a person with mental illness, both because of widely held beliefs about genetic transmission of mental illness which can make the entire family suspect but also because of the reduced opportunities of the person to marry and preserve the family structure. As a defensive reaction against the danger presented to the tree of the family, its member often cut off the offending branch with shunning and discrimination[2].

However, "what matters most" in a given context is highly variable. Yang et al. (2014) give an example that is particularly relevant to this dissertation. They describe the situation of Fuzhounese (Chinese) immigrants recruited from two inpatient psychiatric units in New York City. Interviews with respondents indicated that working was of primary importance because it was a prerequisite for satisfying culturally dictated obligations such as marrying, "extending the lineage", and providing for parents, just as in the general Chinese context. But because of the extremely vulnerable economic position of the Fuzhounese, simply working and surviving was enough to achieve social acceptance. Researchers observed that stigma against those with mental illness was

[2] One might notice a certain circularity in the argument: because people experience stigmatization, they are unable to live in accordance with what matters most, therefore they are stigmatized. The idea is more that the two components reinforce each other. It is exactly because these reactions are inextricably intertwined that it is so difficult to disrupt stigma processes. These kinds of feedback loops create stability.

lessened when they were able to sustain "what mattered most" in this context (working) in spite of their illness.

Thus, the particular circumstances and role expectations of a group interact, resulting in unique logics that support stigmatization of people with mental illness in a way that differs from how stigmatization comes to "make sense" in other groups or contexts. Yang et al.'s (2007) theoretical emphasis on local moral worlds naturally yields information on very particular and unique stigma processes, emphasizing differences among small groups: "a social network, an ethnographer's village, a neighborhood, a workplace setting, or an interest group" (pg. 1528). However, the same concepts although with different underlying logics apply at higher levels of organization as well (e.g., China as a whole).

In fact, it is possible to ask whether there are shared circumstances and role expectations that transcend cultural or country boundaries and impact people with mental illness in similar ways. This is not to negate or underplay the existence of highly specific stigma processes such as those which Yang and colleagues describe, but rather to identify commonalities of experience that span these differences. One can look for commonalities in "what matters most", and commonalities in how circumstances might threaten "what matters most" for people with schizophrenia and others around them. I examine one such nexus of commonalities in the next section.

Economic Situation of People with Schizophrenia

Providing the means of survival for oneself and one's family is a key aspect of social role fulfillment for men almost everywhere, and for women in many places. Unfortunately, for many people with schizophrenia, meeting this requirement is (or has been made) difficult. Across a variety of countries, rates of non-employment among people with schizophrenia are at least 50% and generally over 80% or even 90%. Employment has been estimated at 14-22% in the United States (Rosenheck, Leslie, Keefe, McEvoy, et al., 2006; Mechanic, Bilder, and McAlpine, 2002; Salkever,

Karakus, Slade, Harding, et al., 2007), 12% in France, 13% in the UK, and 30% in Germany (Marwaha, Johnson, Bebbington, Stafford, et al., 2007), 54% in Chile (although only 16.1% are "competitive employed", Chuaqui, Linn, Wilson, and Arredondo, 2017), 14-37% in Turkey (Uzun, Cansever, Basoğlu, and Özşahin, 2003; Karadayı, Emiroğlu, and Üçok, 2011), 30% in Italy (Giugiario, Crivelli, Mingrone, Montemagni, et al., 2012), 25-27% in Spain (Bobes, Arango, Garcia-Garcia, and Rejas, 2010; Usall, Araya, Ochoa, Busquets, et al., 2001), 16% in East Asia as a whole and 19% in North and Central Africa as a whole (Haro, Novick, Bertsch, Karagianis, et al., 2011).

Although the "benefits trap" and other public policy obstacles may be partly responsible for low rates of employment among people with schizophrenia in some countries (Polak and Warner, 1996; MacDonald-Wilson, Rogers, Ellison, and Lyass, 2003; Hansen, Bourgois, & Drucker, 2014; Drake, Meara, and Bond, 2020), studies consistently show that most people with schizophrenia want to be employed (Mueser, Salyers, and Mueser, 2001; Macias, DeCarlo, Wang, Frey, et al., 2001; Chuaqui et al., 2017; Biegel, Stevenson, Beimers, Ronis, et al., 2010).

It is also known that an important factor in the low employment rates of people with schizophrenia is the unwillingness of employers to hire them. In one study, seventy percent of American employers report that they would not hire someone taking anti-psychotic medication (Scheid 1999). In another, 66% of American employers said that they would rarely or never employ someone with schizophrenia (Manning and White, 1995). In a study in Japan, 79% of employers were negative or unsure about the possibility of hiring someone with schizophrenia (Yoshii, Mitsunaga, and Saito, 2018). One third of Americans with mental illness report losing a job offer because their illness became known (Wahl, 1999). In a study in Hong Kong, 45% of people with schizophrenia reported having lost a job after their illness was revealed (Lee, Lee, Chiu, and Kleinman, 2005). Seventy-two percent of Greek employers were not personally willing to offer a job to a person with schizophrenia, and a majority did not believe that a person with schizophrenia could be a productive worker at all (Zissi, Rontos, Papageorgiou, Pierrakou, et al., 2007). In a study

involving 27 countries (Austria, Belgium, Brazil, Bulgaria, Canada, Cyprus, England, Finland, France, Germany, Greece, India, Italy, Lithuania, Malaysia, the Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Turkey and the United States), "employment was the most frequently reported area of perceived discrimination" by people with schizophrenia (Üçok, A., Brohan, E., Rose, D., Sartorius, et al., 2012).

Types of Work

Given the economic conditions just described, it is clear that employers are generally hostile to people with schizophrenia. In this section, I make a distinction between work that is hostile to people with schizophrenia (which include being an employee) and work that is supportive. I explain why some work is hostile and use this as a basis for identifying supportive work.

Hostile Work

For the majority of people in every country in this study, economic survival means selling one's labor to capitalists who own the means of production and who control that labor (including how one works and if one continues to do so). From the capitalist perspective, the interest is in extracting the maximum amount of labor for the minimum cost in order to generate surplus value (Marx). This has two related effects on working that are relevant here. I characterize these as inflexibility and dependence, and explain how inflexible, dependent work is inherently hostile to people with schizophrenia.

Before continuing, I make two notes. First, as will be explained below, employers need not hold incorrect views (whatever may qualify as "incorrect") of people with schizophrenia in order to disadvantage them. Nor do they need to engage in socially unacceptable (as opposed to acceptable) forms of discrimination in order to create disadvantage. For this reason, the main claim does not necessitate any particular model of disability (see Barnes and Mercer, 2010 for a list) or

understanding of schizophrenia itself, although the argument is clearly derived from the social model of disability (Oliver 1983) perspective. This is also why I say it is *inherently* hostile. The hostility is not derived exclusively, perhaps not even primarily, from employers' prejudices, but is intrinsic to their ordinary way of doing things.

Second, the "hostile" and "supportive" work types I describe below are ideal-types. Clearly, there is a spectrum of inflexibility and dependence which differs by job, class, country, and time period (Kalleberg, 2009; Keys and Danziger, 2008; Lambert, 2008; Kalleberg, 2011; Beck, 2014). However, the claim is that inflexibility and dependence are intrinsic to the capitalist mode of working. So, even when changes are made in the relationship between employers and employees, the fundamental nature of the relationship is not altered, only softened or hardened.

— Dependence —

In the capitalist mode of production, in order for a person to work, someone must want to buy their labor. This is in contrast both to modes of production in which one is entitled to (and obligated to provide) labor (e.g., feudalism) and those in which what is being sold is the product of one's labor rather than the labor itself (e.g., small-scale commodity producers such as farmers who sell cash crops). Dependence in working is what allows discrimination to occur: by definition, it is employers who discriminate among potential and current employees when they choose to hire some and not others. This discrimination may be pure discrimination ("discriminatory tastes", Becker 1957), statistical discrimination (Phelps, 1972; Arrow 1972), or merely the everyday judgements that employers apply which are not particular to people with mental illness. These have various degrees of social and legal acceptability, but are all enabled by the fact that employers have the power to confer employment, and all work to disadvantage people with schizophrenia as I explain below.

Link and Phelan (2001) have noted the importance of power to stigmatization: stigmatization occurs when differentiation, labeling, status loss, and separation occur in a situation in

which power can be exercised. The natural extension of this observation (that power is necessary) is that one is quite likely to see stigma in action *wherever* power is being exercised. Stated differently, in situations where power is exercised, it will generally be exercised in accordance with prevailing beliefs, including stigmatizing beliefs. Sellers of labor are economically, politically, and ideologically disempowered (Marx; Wright, 1978). The power imbalance between buyers and sellers of labor (in other words, the dependence of labor sellers) means that stigmatization is very likely to occur in employment.

A second way in which discrimination occurs is in the types of "everyday judgements" that employers make from positions of power. While not necessarily intended to disadvantage people with schizophrenia, it has that result. Here is an example. One's past as a worker is important in the competition for jobs. An inference is made about future work based on past work. This results in a strong disadvantage for people who almost by definition had a period in their lives in which they were not conforming to acceptable norms of workplace behavior or productivity. People whose pasts suggest riskiness, whether or not it is fair to project their past experiences into the future in this way, are at a strong disadvantage when convincing a potential employer to hire them. Employers, whose objective is to maximize profit, rarely wish to take what they define as an unnecessary risk. Because potential employees are dependent on employers' agreement to obtain a position, they are powerless in the face of such a judgement.

— *Inflexibility* —

Now I turn to the second element: inflexibility. The development of capitalism can be characterized as the "loss of control over the labor process by workers" (Wright, 1978, pg. 64). Work is organized with the objective of maximizing surplus value, and flexibility in how people work is narrowed considerably to obtain this end. For example, "the culmination of this process [loss of control of the labor process] was the mass production assembly line regulated by principles

of Taylorism, in which the worker lost all autonomy and became virtually a human component of the machine itself" (pg. 65). While Taylorism may be less prominent now, it remains true that the act of laboring is subject to extensive discipline.

Relatedly, "in organizational logic, filling the abstract job is a disembodied worker who exists only for the work. Such a hypothetical worker cannot have other imperatives of existence that impinge upon the job" (Acker 1990, pg. 149). While no one fits this definition perfectly, some fit it better than others. Those who do not fit it as well are seen as less desirable. This is leads to workplace discrimination even against groups that are not normally stigmatized (e.g., women with children (Budig and England, 2001), moonlighters (Sugarman, 2003)). The greater the extent to which people are known to have "other imperatives of existence", the farther they are from a machine-like, disembodied entity, and the less desirable they are as employees.

By and large, employers' demand that workers avoid "other imperatives" is seen as a perfectly legitimate. Where this is not the case, it constitutes a grudging exception rather than the norm. This is especially apparent with respect to mental illness. For example, in an update to a report for the U.S. government, being fired due to "lower productivity during periods of illness" is explicitly differentiated from "discriminatory treatment" (Cook, 2006). What is required is that a person not be *presumed* in advance to be unable to meet employer demands because of their illness. But, if they are later proven to be unable to meet employer demands, then their expulsion from work is seen as legitimate[3].

In short, working as an employee requires conformity to demands of employers, which are designed to optimize efficiency. Failure to conform to these demands is generally seen as the fault of the employee, and regarded as a legitimate reason to deprive them of their livelihood. To the

[3] In U.S. law, there is an additional requirement that employers make "reasonable accommodation", but not if it "would cause undue hardship, would be financially costly, or would fundamentally alter the type of operations of the business" (Scheid, 2005).

extent that people with schizophrenia experience difficulty in conforming to these demands[4], they will be disadvantaged in keeping their jobs[5].

In summary, I suggest that there are two main reasons for employment discrimination against people with schizophrenia: the internal logic of contemporary forms of work (inflexibility) and the fact that employers are empowered to decide who gets to work (dependence). The standard employment relationship has these two elements in abundance. As a result, I characterize work of this type as "hostile".

Supportive Work

I contrast supportive work with the kind of hostile work just described, and give an example of supportive work: independent street vending. Generally speaking, a street vendor can determine how, when, and where he works (flexibility), and he is minimally reliant on others agreeing that he be allowed to work (independence). If he experiences a psychotic break and then needs time to receive treatment, it would minimally impact his ability to earn money when he returns. He needs no one's permission to earn a living, and so any employment problems he may have had in the past because of his illness are quite irrelevant to his future earnings. His medical history is unlikely to become known to anyone who buys from him, and even if it did, because he is not particularly dependent on any one person for income, it would take a concerted community effort to prevent him from being able to earn a living as a result of it. In towns or cities, this is unlikely to even be possible.

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[4] It has been noted that "many persons with mental illness are conscientious and reliable employees without special accommodations, but others require them" (Mechanic, Bilder, and McAlpine, 2002).

[5] A related but somewhat different argument regarding people with mental disabilities can be found Ryan and Thomas (1980), and quoted in both Oliver (1999) and Barnes and Mercer (2010): "The speed of factory work, the enforced discipline, the time-keeping and production norms—all these were a highly unfavorable change from the slower, more self-determined methods of work into which many handicapped people had been integrated" (pg. 101).

The situation of an employee doing the same kind of labor is entirely different. Depending on the country, employees may receive limited or no sick leave and can lose their job if they exceed its bounds[6]. Employees' work is also endangered by the fact that if they are hired, their illness might become known to their employer. If this does happen, then their employer might fire them, and in many countries this would be legal (and likely) (WHO, 2007; WHO, 2013). In others, this kind of discrimination, while illegal, is still widespread (Stuart, 2006; Scheid 2005; Callard, Sartorius, Arboleda-Flórez, Bartlett, et al., 2012; Ricci, Lee, and Chu, 2004). Furthermore, in countries where discrimination is illegal, protections typically do not extend to the consequences of illness, such as periods of decreased productivity or unusual behavior (see Callard, Sartorius, Arboleda-Flórez, Bartlett, et al., 2012 for an international overview of legislation). In addition, employees must ask to be hired, and employers are often suspicious of people who have "gaps in their resume", long periods of unemployment, or who have previously been fired (Fernandez-Blanco and Preugschat, 2018; Kugler and Saint-Paul, 2000; Blau and Robins, 1990). So if someone experiences unemployment due to illness or if that person is fired by an employer who discriminated against them in the past, this makes it more difficult for that person to get a job in the future.

Of course, these are idealized representations. A variety of practical, legal, and social restrictions likely make the actual flexibility and independence of a street vendor's situation imperfect. And conversely, legal and employer-specific protections may make things less difficult for an employee with schizophrenia. As scholars have noted, "the traditional paradigms of, on the one hand subordinate employment and, on the other, autonomous self-employment, are less often the

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[6] The extent to which this is a problem varies greatly by country. Compared to most wealthy countries, the U.S. offers limited sick leave with barriers to use (Heymann, Rho, Schmitt, and Earle, 2010). However, even under European protections, employees may still face problems. For example, Flack (2014) found that 3% of a Dutch sample of 4,132 people lost their job during sick leave benefits, and this was more likely to occur among people with mental disorders. Some countries such as South Korea (Kim, Lee, Muntaner, and Kim, 2016) do not require employers to offer any sick leave. In others, such as Bangladesh (Faroque and Mollah, 2018) and South Africa (Bhorat, Kanbur, Stanwix, and Thornton, 2020), even though sick leave is legally mandated, legal protections are often not adhered to.

norm" (ILO, 2018, pg. 1). Nonetheless, there is a fundamental difference between those whose economic life is essentially controlled by another (usually but not always employees) and those for whom this is not the case (usually but not always the self-employed). This is the distinction that I am interested in making.

A premise of the earlier discussion on hostile work was that people experience inflexible, dependent conditions of work when they sell their labor. Therefore, to identify supportive work, one should identify the positions in contemporary economies from which one does not sell one's labor. The street vendor described occupies one of these positions. In the traditional model of capitalism (Marx), the classes who do not sell their labor are the bourgeoisie and the petty bourgeoisie. Contemporary analyses identify additional groups. For example, Wright (1978) identifies three "contradictory" class positions that have characteristics of two classes: semi-autonomous employees, small employers, and managers and supervisors. Among these, small employers' work is both flexible and independent, which is consistent with the fact that Wright identifies small employers as occupying the border between bourgeoise and petty bourgeoise[7].

People in these class positions (bourgeoisie, petty bourgeoisie, and small employers) are much less vulnerable to being deprived of their livelihood because of their illness. This is because they do not sell their labor. Certainly they may still face illness-related work difficulties, but these are not exacerbated by the hostility that is intrinsic to being an employee. I call independent, flexible work of this kind "supportive".

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[7] With respect to the other two categories, just as these positions are not cleanly allocated to one or another traditional class, it is difficult to position them with respect to independence and flexibility. Managers and supervisors tend to have much more flexibility than other employees, but they nonetheless sell their labor and are therefore dependent (although that dependence is somewhat tempered by their more advantaged position in the labor market). Dependence and inflexibility go down a great deal when one reaches for the upper echelons (e.g., CEOs), which is consistent with Wright's observation that top executives and top managers are not really selling their own labor power. Semi-autonomous employees are a highly heterogeneous group. There is significant variability in both flexibility and dependence.

Public Perception

Existing evidence suggests that members of the public are well aware of the difficulties that a person with schizophrenia faces in getting a job of the hostile type (i.e., getting and staying hired). In a study in Germany, 81% of people believe that most people would hire another applicant over a person with mental illness (Gaebel, Baumann, Witte, and Zaeske, 2002). In a comparative study of the US and South Korea (Ryu, 2008), respondents were asked ten questions about their beliefs regarding employment and schizophrenia. Nine of these were about capabilities, functioning, and effectiveness, and one asked whether it was likely that the person with schizophrenia would be hired. In both countries, this one question had by far the highest rates of disagreement with the premise that favored the person with schizophrenia. In another U.S. study, 56% of employers believed that others (other employers) would be biased against hiring someone with a mental illness (Manning and White, 1995). Similarly, 89% of Greek employers believe that a person with schizophrenia has no chance of finding a "regular" job (Zissi, Rontos, Papageorgiou, Pierrakou, et al., 2007).

That people are aware of the difficulties people with schizophrenia face in being hired is not surprising, since most people in every country in this study are or have been employees (ILO, 2011a). They are aware of its rigors and the attitudes of employers, since they themselves have had to navigate these. However, just as people are aware of the general climate of employment, they are also likely to be aware of other ways of earning a living.

This is more likely to be the case in countries where earning a living in a different way is more common. These are also the countries in which it is easier to earn a living in what I have called a supportive job. The reason for this is as follows. The ability of a person to obtain supportive rather than hostile work depends on their personal circumstances, but also depends on the structurally determined availability of work of this type. A given person has a much worse chance of being able to obtain supportive work if in their country almost no one does such work.

This is because factors that conspire[8] to keep other people from supportive work are just as likely to apply to them as well. In contrast, if many people have supportive jobs, working in this way will seem much more feasible.

Recall that in this study's vignette, the person is described as having previously worked (see Chapter 1), indicating a pre-existing ability to earn a living. Recall also that the vast majority of respondents in every country surveyed believe that the person's condition will improve (either with treatment or on its own). Thus, a respondent might well imagine that the person in the vignette, once recovered, would have great difficulty becoming an employee again (because of all of the ways previously described in which this kind of work in intrinsically hostile to people with schizophrenia), but also that it is possible for them to work effectively in a supportive job. As suggested earlier, the degree to which it is possible to obtain supportive work is closely tied to the structurally determined availability of this kind of work, as is the public sense of it as a viable alternative.

So, the argument here is that people in countries with a higher prevalence of supportive work will view the chances of a person with schizophrenia being able to satisfy the social role requirement of working as higher than will people in countries where the prevalence of supportive work is lower.

Thesis and Analysis Questions

It is now possible to combine these observations into the final argument.

Capitalist modes of employment are hostile to people with mental illness, leading to the sense that people with schizophrenia are unable to work. However, every economy offers some jobs that are not inherently hostile to people with schizophrenia: roughly speaking, these are jobs where

[8] "Conspire" may seem strong, but in every country surveyed in the 1997 International Social Survey Program (ISSP) wave, at least twice as many people in each country said they would prefer to be self-employed (rather than employees) as were actually self-employed (reported in Blanchflower, Oswald, and Stutzer, 2001). In the US, almost seven times as many people wish to be self-employed as are actually self-employed.

people work for themselves. Economies differ in the degree to which jobs of this type are available. In other words, economies differ in the opportunities they provide for people to satisfy this element of their social roles. The more of these jobs there are, the more likely it will seem to others that a person with schizophrenia will be able to earn a living (or, the less certain it will seem that he will not be able to). In countries where there is more opportunity, the sense of riskiness attached to someone with schizophrenia will therefore be lower. Others will believe that he has a better chance of being able to "engage in activities that define what constitutes being a moral person" (Yang et al., 2014, pg. 86). Because stigmatization is a defensive reaction around "what matters most" (Yang, 2014), stigmatization will be lower. Thus I hypothesize that countries whose economies are structured so as to provide more opportunity to work in a supportive job will have lower levels of public stigma.

This argument differs fundamentally from the usual ways in which people understand the reasons for stigma. Instead of invoking culture, whether in the form of beliefs about mental illness or general principles such as communitarian orientations, this argument proposes that the structure of contemporary economies promotes stigma and that differences in this structure are an important driver of variation in levels of public stigma from place to place.

These hypotheses are addressed by the following Analysis Questions:

Analysis Question 1: Do countries whose economies offer more supportive jobs have lower levels of public stigma?

Analysis Question 2: To what extent can differences in countries' levels of public stigma be attributed to differences in availability of supportive jobs in those countries?

Data and Methods

Sub-Populations

The main objective of the chapter is to relate an aspect of the structure of the economy to the degree of stigmatization that people with schizophrenia face. But, while it is possible to talk about the structure of the economy generally, it is also observable that the economy presents a different aspect to men and women in most countries. One component of this is the social expectations around work for each group. For example, 38% of Chinese people, 27% of Cypriots, and 16% of Germans agree that a man has more right to a job than a woman (World Values Survey, 2015). Women's participation in the economy also usually differs from that of men. The 2010 percentage-point difference in labor force participation between men and women was 46% in Bangladesh, 26% in Argentina, 13% in the US, 9% in Iceland (ILO, 2011a). Among women who do work, the nature of that work often differs. For example, in many countries, women are more likely to work part-time and more likely to work at home (International Labor Organization, 2011a, 2011b). They are also usually less likely to own their own business (Gallup, 2011). Because of these differences between men and women, I separate the analyses that follow by gender.

Implementationally, this means that for all data from the SGC-MHS study (demographics, vignette person characteristics, contact experience, beliefs, and stigma), the subsample I call the "male group" consists only of those respondents whose vignette was about a man. Note that it is not the set of respondents who are themselves men. This is because I am interested in the stigma directed toward men, not in stigmatization by men. This subgroup gives information on the stigma conditions that apply to men. Similarly, the subsample called the "female group" is only those respondents whose vignette was about a woman.

For the economic data, the subsample for the "male group" is male respondents and for the "female group" it is female respondents. This is because the economic data reported by women/men tells one about the economic conditions that apply to women/men. Additionally, because I

only have economic data for urban Bangladesh, I additionally limit its subsamples to urban dwellers for both the stigma data[9] and for the economic data.

Outcome Variable

The main outcome variable is country level of public stigma. The is the mean of the overall stigma scores of each respondent in the country, weighted. In addition, results are given with each of the three stigma sub-scores (Intolerance, Social Distance, Role Exclusion) as outcomes at the country level (weighted country-specific means of individuals' stigma sub-scores).

Main Explanatory Variable

The main explanatory variable is the fraction of jobs in a country that are supportive rather than hostile. Ideally, one could identify a job as hostile based on whether it is offers a position of dependence and inflexibility, and as supportive if it offers independence. However, there is very little data on how many jobs in a country are dependent or independent. This is discussed more extensively in Appendix D. However, in the introduction, I also identified the bourgeoisie, petty bourgeoisie, and small employers as class positions in which people have supportive jobs. These three positions are differentiated from the others (employees, semi-autonomous employees, managers/supervisors) by the fact that they involve business ownership. So, in the absence of data

[9] It would be most desirable to limit Bangladesh's stigma data subsample to respondents whose vignette was about an urban dweller. However, this is not possible because respondents were given no information about whether the vignette person is living in an urban or rural environment. However, I believe that limiting it to urban respondents is a good approximation. One reason for this is that Bangladesh continues to experience significant rural-to-urban migration. Its urbanization rate from 1950 to 2018 is in the top 90% of countries in the world, and from 2000 to 2018 it experienced an 58% increase in the share of urban dwellers (ILO, 2019). As a result, it may be that the economic situation of cities is seen as fairly relevant to everyone, regardless of whether they currently live in a rural or urban environment. But to be more conservative, I further limit the subpopulation to urban dwellers. This is because, in the absence of other information, respondents are likely to automatically assume that the vignette person is like themselves: urban dwellers will probably assume that the vignette person is an urban dweller, rural dwellers will probably assume that the vignette person is a rural dweller.

for all countries on independence and flexibility, I use business ownership as an approximation for whether the person's job should be classified as supportive.

The Gallup World Poll (Gallup, 2011), whose data for each country are +1,000-person nationally-representative samples of non-institutionalized adults over the age of 15, asked each respondent if s/he currently owns a business. I use the wave closest in time to the date of the SGC-MHS data collection for each country (2012 for Iceland, 2011 for all other countries; SGC-MHS data was collected between 2004 and 2011). Because these Gallup data include people who are unemployed or not in the labor force, I adjust these values by the age 15+ unemployment rate and labor force participation rate for each country (ILO, 2011c; ILO, 2011d).

Exceptions are made for two countries: Cyprus and Bangladesh. The Cyprus data is from the European Working Conditions Survey (Eurofound, 2010), which asked people if they "generally have more than one client" and if they are the ones who "make the most important decisions on how to run [their] business", including whether to hire employees. Following Oostveen, Biletta, Parent-Thirion, and Vermeylen (2013), if a person agrees with these statements, then I consider that their work is supportive because it is independent. The Bangladesh data is from the 1999 Urban Livelihoods Survey (Pryer, 2017), which identified "self-employed" workers in Dhaka as dependent (using my terminology, in hostile work) if they depended upon a larger enterprise for credit, tools, or premises (Pryer, Rogers, and Rahman, 2006). Dhaka is the capital city of Bangladesh and where around one-quarter of its urban population resides (Bangladesh Bureau of Statistics, 2014), and some evidence suggests that it is fairly representative of other large cities with regards to independent work (e.g., Khulna; Pryer, 1993).

The reason for having different data for these two countries is because available direct measurements of the prevalence of independent jobs in these countries exist, and differ from the Gallup data by almost a factor of two. In contrast, for the other six countries where a direct measurement exists (Bulgaria, Belgium, Germany, Great Britain, Hungary, and Spain), values are

very close to each other (differences are three percentage points or less for every country). Rather than dropping these data points, which would reduce the sample size by almost 12%, I have chosen to privilege the direct measurements. However, I note that dropping Bangladesh or Cyprus from the analysis instead does not fundamentally change the conclusions below, it only decreases statistical power somewhat. Additional details can be found in Appendix D.

Table 4.1. Country-Level Descriptive Statistics for Demographics, Stigma Scores, Beliefs, and Percent Supportive Jobs, by Gender Group

	Male Group				*Female Group*			
	Mean	Standard deviation	Min	Max	Mean	Standard deviation	Min	Max
Demographics								
N (respondents per country)	202	186	63	932	139	79	55	410
Age (years)	44.4	21.7	34.1	48.9	43.2	3.1	35.8	48.4
Education (years)	11.0	1.8	7.8	13.7	11.1	2.1	7.9	14.6
% female	51.0	4.4	40.2	61.6	51.4	5.4	41.8	65.6
% minority	16.8	22.5	0.0	83.6	16.8	23.7	0	89.5
Contact Experience								
% ever known someone MI	44.4	19.6	14.6	73.5	48.6	19.8	17.3	74.8
% ever been diagnosed MI	8.4	4.9	2.2	16.8	8.7	5.0	1.8	16.7
Vignette Person Characteristics								
% outgroup	48.4	4.5	34.3	56.5	49.9	4.6	36.2	55.4
Beliefs								
% biomedical (B)	7.8	6.4	0.0	25.7	8.9	6.5	0.7	21.8
% biopsychocial (BP)	68.2	12.6	42.7	84.9	70.5	11.1	44.2	86.9
% psychosocial (P)	19.4	11.2	7.5	46.7	18.2	8.2	5.9	30.6
% none of these (nBP)	3.4	3.9	0.0	12.4	2.5	2.5	0.0	8.1
% prognostic pessimism	6.9	5.7	0.2	18.9	6.0	6.9	0.0	23.6
% blaming	50.0	22.1	7.2	85.0	50.0	23.7	5.0	87.8
Stigma Scores								
Overall stigma score (0-100)	50.2	8.8	38.1	69.5	48.4	12.5	35.6	81.4
Intolerance subscore (0-10)	4.6	1.0	3.0	6.4	4.4	1.3	3.0	7.8
Social distance subscore (0-10)	5.2	0.8	3.9	6.4	4.9	1.3	3.3	8.3
Role exclusion subscore (0-10)	4.7	1.3	3.3	7.7	4.7	1.4	2.9	7.9
Country Economic Characteristics								
% supportive jobs	21.2	6.1	12.5	35.3	17.9	9.9	6.1	47.5

Sources: Stigma in Global Context - Mental Health Survey (SGC-MHS), 2011/2012 Gallup World Poll, 2010 European Working Conditions Survey, 1999 Urban Livelihoods Study

All data are weighted in the appropriate manner as designated by the sources to achieve country representativeness. Statistics given are based on an equal weighting of each country.

The male group subsample for the SGC-MHS data is those respondents whose vignette is about a man. The male group subsample for the economic data is males. Parallel rules describe the female group. Additionally, the Bangladesh subsamples only include urban dwellers.

Controls

Since Chapter 3 demonstrated that individual-level characteristics and their varying prevalences explain some of the difference in levels of public stigma from country to country, I

control for them here to isolate the effect of supportive jobs. The characteristics controlled for are respondent demographics (age, gender, education, race), vignette person out-group status, contact experience, and beliefs (etiological, prognostic, and blame-related). All of these data are from the SGC-MHS dataset and were described previously in Chapters 1 and 2.

Descriptive statistics at the country level for all variables are shown in Table 4.1 above.

Methods

Analysis Question 1 asks "Do countries whose economies offer more supportive jobs have lower levels of public stigma?". To answer it, I use a variation of multi-level modeling sometimes called a means-as-outcomes model (Raudenbusch and Bryk, 2002). In this form, both the outcome of interest (level of public stigma or one of the three subscales) and the explanatory variable (fraction of supportive jobs) are group-level variables because they are characteristics of each country rather than of each person. In later models, I include additional control variables that have an individual-level component and a group-level component.

In these models, the supportive jobs coefficient is interpreted essentially in the usual way: a one-unit increase in percentage of jobs that are supportive (γ_{01}) is associated with a Z_j-units increase in β_j (country mean stigma score), controlling for the other variables (e.g., if all countries had the same fraction of prognostic pessimists, or the same mean age). I do not report the controls' coefficients because they are not interpretable. This is because they are a mixture of the individual effect and the country prevalence effect. A detailed discussion of why this is the case can be found in Chapter 3.

To address Analysis Question 2 ("To what extent can differences in countries' levels of public stigma be attributed to differences in availability of supportive jobs in those countries?"), I compare the level-2 residuals (μ_{0j}) across nested models. Changes in the variation of these residuals resulting from the inclusion of the the supportive jobs variable can be used to estimate how much

of the variation in countries' levels of public stigma is due to differences in the fraction of supportive jobs a country's economy provides. To compute the change in variation, I use the same method as was employed in Chapter 3.

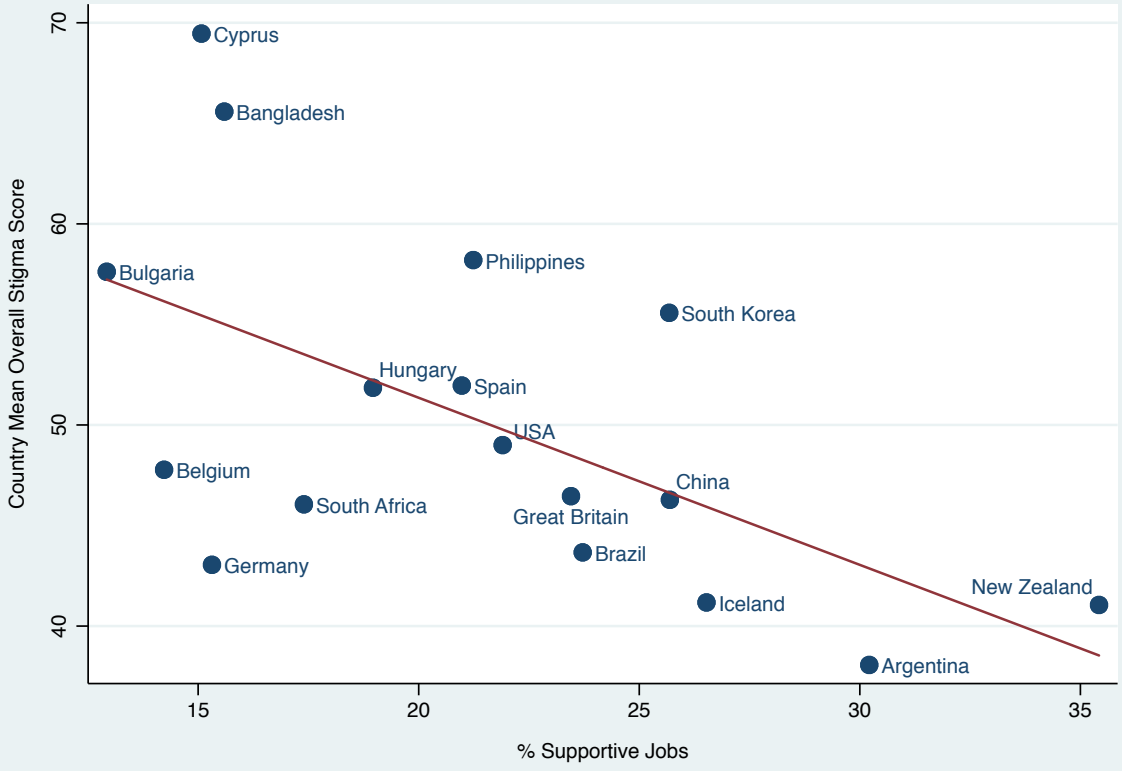
For both Analysis Questions, separate analyses are the done for the male group and the female group.

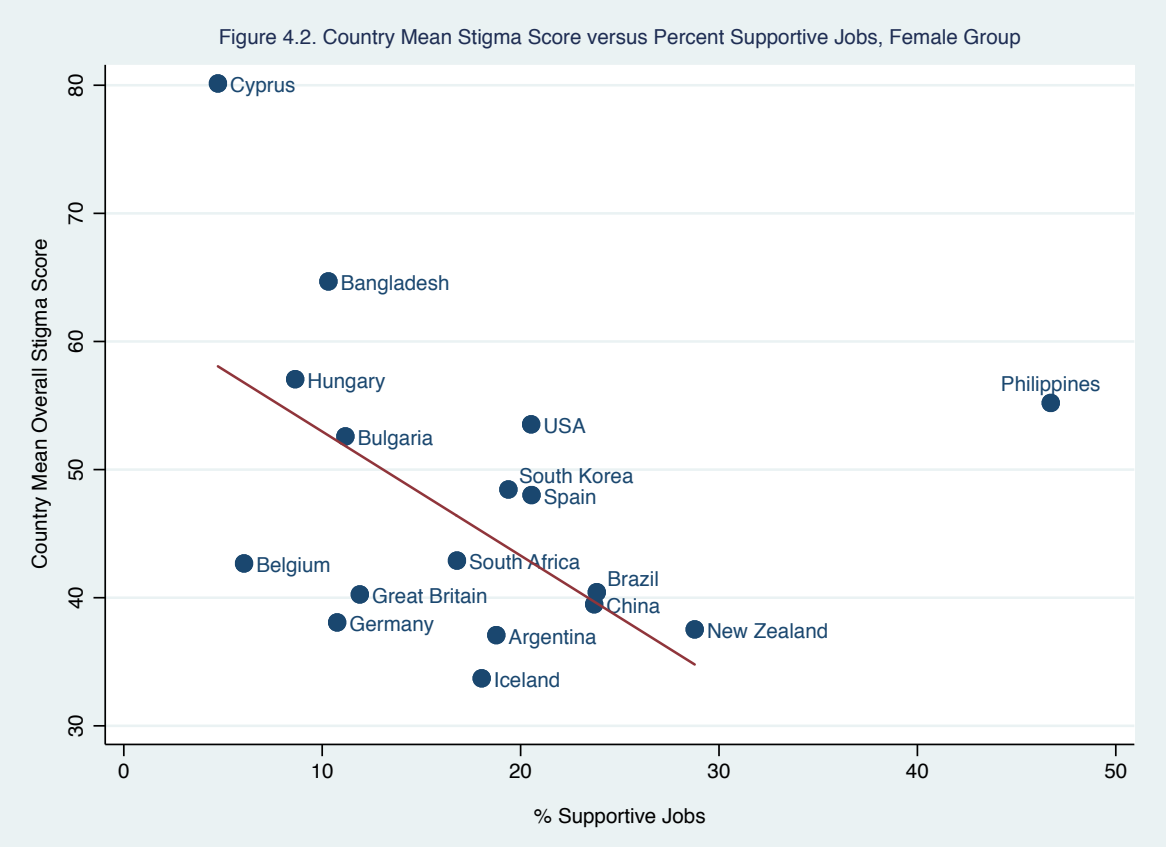
Analysis

Analysis Question 1

Analysis Question 1 asks, "Do countries whose economies offer more supportive jobs have lower levels of public stigma?". The raw relationship between countries' levels of public stigma and fraction of jobs that are supportive are shown in Figure 4.1 and Figure 4.2, separated by gender group.

Figure 4.1. Country Mean Stigma Score versus Percent Supportive Jobs, Male Group





Before proceeding, I make a note about outliers. It is observable that the Philippines is a strong outlier for the female group, and this is confirmed by its Cook's distance after regressing the country mean stigma score on percent supportive jobs for the female group subsample. The Cook's distance for Cyprus also suggests outlier status, but less definitively. The Cook's distance for the Philippines datapoint after regressing the country mean stigma score on percent supportive jobs for the female group subsample is 2.9, and for Cyprus it is 0.66. While it is usual to use 1 as the cutoff for outliers, $4/(n-k-1) \approx 0.27$ may be more appropriate when there are a small number of cases. Dropping Philippines and keeping Cyprus in allows the results of the female group to be statistically significant. If Cyprus is not included, the percent supportive jobs coefficient does not achieve significance for any of the models. This may imply the absence of a relationship, but alternatively, a decline in statistical significance is not surprising if one removes 2 of 17 datapoints, even if there is

a real relationship. So, to avoid losing too much data, I have kept Cyprus in in the analyses that follow. For this reason, the results for the female group should be considered cautiously. The male group results are much more robust. There are no outliers and dropping highest Cook's distance countries does not cause results to drop out of significance. I return to this point in the discussion section.

Consistent with Hypothesis 1, these graphs suggest that as country fraction of supportive jobs increases, level of public stigma decreases. A sequence of nested multi-level models shown in Table 4.2 examines this more closely.

Table 4.2. Mixed Models of Overall Stigma Score on Country Characteristics and Individual Characteristics, by Gender Group

Model Description	% Supportive Jobs, Only (1)		+ Demographics, Contact (2)		+ Beliefs (3)		+ Random Effects (4)	
Country Characteristics								
% supportive jobs, male group	-0.82***	(0.28)	-0.76**	(0.27)	-0.63*	(0.30)	-0.91***	(0.25)
% supportive jobs, female group	-0.96**	(0.45)	-0.93**	(0.42)	-0.80*	(0.40)	-0.85*	(0.41)
Respondent Demographics								
Age (years)			*x*		*x*		*x*	
Education (years)			*x*		*x*		*x*	
Gender			*x*		*x*		*x*	
Race (majority/minority)			*x*		*x*		*x*	
Vignette Person Demographics								
Race (majority/minority)			*x*		*x*		*x*	
Contact Experience								
Ever known someone MI			*x*		*x*		*x*	
Ever been diagnosed MI			*x*		*x*		*x*	
Beliefs								
Etiological beliefs (B, BP, P, nBP)					*x*†		*x*	
Blaming					*x*†		*x*	
Prognostic pessimism					*x*		*x*	
Random Effects								
Etiological beliefs (B, BP, P, nBP)							*x*	
Blaming							*x*	
Prognostic pessimism							*x*	
Observations, male group	4,024		3,785		2,822		2,822	
Observations, female group	3,758		3,521		2,540		2,540	
Countries (m, f)	17, 16		17, 16		17, 16		17, 16	

Sources: Stigma in Global Context - Mental Health Survey (SGC-MHS), 2011/2012 Gallup World Poll, 2010 European Working Conditions Survey (Cyprus), Urban Livelihoods Study (Bangladesh)

Values for % supportive jobs coefficients are from independent but otherwise identical models run on the indicated subsamples. The female group analyses do not include data from the Philippines.

An *x* indicates that the variable was included in the model.

† Includes interaction with country development status.

*** p<0.01, ** p<0.05, * p<0.1

Model (1) shows the unadjusted relationship between percent of jobs in a country that are supportive and that country's level of public stigma. Model (2) controls for demographic differences across countries. Model (3) additionally controls for the individual-level effect of etiological, prognostic, and blaming beliefs, combined with the country-level differences in their prevalences. In this model, etiological and blaming belief effects are allowed to vary by development status and prognostic beliefs are not, consistent with the findings in Chapter 2. However, within a given development status, they are presumed to be the same. Model (4) allows all individual-level belief effects to vary by country, such that the effect of, for example, brain disease attribution is specific to each country and is independent of the effect of brain disease attribution in other countries. Models (1)-(3) are random-intercept models, Model (4) is a random-intercept-random-effects model. Each model was run separately for the male group and the female group.

For the male group, the raw relationship between a country's percent supportive jobs and its level of public stigma (Model 1) is that for each one percentage-point increase in the fraction of men's jobs that are supportive, there is a decrease of 0.82 points in the average level of stigma directed toward men with schizophrenia (p-value: 0.010). For the female group, the model estimates that for each one percentage-point increase in the fraction of women's jobs that are supportive, there is a 0.96-point decrease in the average level of stigma directed against women with schizophrenia (p-value: 0.047).

Some of the effect of supportive jobs appears to be due to confounding with demographics, contact experience, and beliefs about mental illness, as shown by the decrease in the size of the coefficients from Model (1) through Model (3). Model (3) estimates that each one percentage-point increase in the fraction of men's jobs that are supportive is associated with a decrease of 0.63 points in the average level of stigma directed toward men with schizophrenia (p-value: 0.052). However, Model (4), which allows the effect of each belief to be specific to each country, has the largest and most strongly significant coefficient (β=-0.91, p-value: 0.002), suggesting that the true effect of

supportive jobs availability may be masked by rather than confounded with the effects of the other characteristics. In the case of the female group, the size and significance of the supportive jobs coefficient is also diminished by controlling for demographics, contact, and beliefs. If the effects are assumed to be the same within development status (Model 3), the coefficient for supportive jobs is -0.80 (p-value: 0.063). If effects are allowed to vary by country (Model 4), the coefficient is -0.85 (p-value: 0.059).

Across all models, a higher proportion of supportive jobs is associated with lower levels of public stigma. The relationship is such that a one percentage-point increase in supportive jobs is associated with close to a 1-point decrease in country mean stigma score. This relationship is statistically significant for the male group at the α=0.05 level but not for the female group. The estimates for the female group are usually slightly larger than those of the male group, although the differences are not significant, and this is not the case when random effects for beliefs are accounted for.

The same models were rerun but with the mean stigma sub-scores as the outcome variables rather than the overall stigma score. Separate models were run for each of the three stigma sub-scores (Intolerance, Social Distance, and Role Exclusion). The supportive jobs coefficients for these models are shown in Table 4.3. Recall that the sub-scales range from 0 to 10, whereas the overall stigma score ranges from 0 to 100.

First consider results for the male group. Percent supportive jobs has a strong negative relationship with role exclusion. A one percentage-point increase in supportive jobs is associated with a 0.15-point decrease in country mean role exclusion score (Model 1, p-value: 0.003). Controlling for demographics, contact, and beliefs reduces the estimated coefficient slightly to -0.12 (Model 3), but it remains strongly statistically significant (p-value: 0.014). The sizes of the coefficients with intolerance and desire for social distance as outcomes are less than half the size of that with role exclusion as the outcome. Without controls (Model 1) the corresponding estimates

are -0.07 (p-value: 0.031) and -0.05 (p-value: 0.034), respectively. Although they do not retain statistical significance at the α=0.05 level with all controls included (assuming same effect within development status, Model 3), the estimated sizes of the coefficients are hardly decreased (p-values are 0.089 and 0.134, respectively). When effects are allowed to vary by country (Model 4), the coefficient when intolerance is the outcome is somewhat larger and is strongly statistically significant (β=-0.09, p-value: 0.007). For social distance as outcome, the size of the coefficient is largely unchanged, but it becomes near statistically insignificant (β=-0.04, p-value: 0.099). Therefore, I conclude that country proportion of supportive jobs is negatively associated with stigmatization of men across all three dimensions of stigma, but most strongly with respect to role exclusion and least strongly with respect to desire for social distance.

Table 4.3. Coefficients for Percent Supportive Jobs from Nested Random-Intercept Models of Intolerance, Social Distance, and Role Exclusion Stigma Sub-Scores

Model Description†	Outcome: Intolerance		Outcome: Social Distance		Outcome: Role Exclusion	
Male Group						
(1) % Supportive Jobs	-0.07**	(0.03)	-0.05**	(0.02)	-0.15***	(0.04)
(2) + Demographics, Contact	-0.07**	(0.03)	-0.05**	(0.02)	-0.14***	(0.04)
(3) + Beliefs	-0.06*	(0.03)	-0.04	(0.03)	-0.12**	(0.04)
(4) + Random Effects	-0.09***	(0.03)	-0.04*	(0.02)	-0.13**	(0.05)
Female Group						
(1) % Supportive Jobs	-0.07	(0.05)	-0.11**	(0.05)	-0.13**	(0.05)
(2) + Demographics, Contact	-0.07	(0.04)	-0.10**	(0.04)	-0.13**	(0.04)
(3) + Beliefs	-0.07	(0.04)	-0.08*	(0.04)	-0.12***	(0.04)
(4) + Random Effects	-0.07	(0.04)	-0.08*	(0.04)	-0.13***	(0.04)

Sources: Stigma in Global Context - Mental Health Survey (SGC-MHS), 2011/2012 Gallup World Poll, 2010 European Working Conditions Survey, Urban Livelihoods Study

† Models are parallel to those of similar number shown in Table 4.2.

The female group analyses do not include data from the Philippines.

*** p<0.01, ** p<0.05, * p<0.1

Next consider results for the female group. With and without controls, the estimated relationship between supportive jobs and role exclusion is that a one percentage-point increase in percent of supportive jobs is associated with a 0.13-point decrease in country mean role exclusion score (Model 1 p-value: 0.016, Model 2 p-value: 0.013, Model 3 p-value: 0.010). This is similar to the

situation for the male group. Unlike for the male group, the estimate of the supportive jobs effect on country mean desire for social distance score is only slightly smaller than that on country mean role exclusion score. Without controls, it is -0.11 (Model 1, p-value: 0.039), decreasing in absolute value to -0.08 (Model 3, p-value: 0.063; Model 4, p-value: 0.069) when demographics, contact experience, and beliefs are all controlled for. The supportive jobs effect on country mean intolerance score is smaller than either, and never achieves statistical significance: p-values are 0.125, 0.123, 0.148, and 0.137 for Models 1, 2, 3, and 4 respectively. Therefore, I conclude that country proportion of supportive jobs is negatively associated with desire for social distance from and role exclusion of women, but has no effect on intolerance.

In summary, all three aspects of stigma seem to be decreased when the proportion of supportive jobs increases among the male group. Among the female group, proportion of supportive jobs has no effect on intolerance but does affect desire for social distance and role exclusion. Proportion of jobs that are supportive has the strongest effect on role exclusion for both gender groups.

Analysis Question 2

Question 2 asks how much of the variation in country mean stigma scores is attributable to variation in the fraction of jobs that are supportive. Table 4.4 shows the residual variations at individual and country level for five models, with results computed separately for each gender group. In order to compare like to like, the samples are limited to those respondents who have data for all variables used in these models.

Model (5) is the empty model, which gives the actual levels of within- and between-country variation present in the data. Model (6) accounts for demographics and contact experience (hereafter called controls), Model (7) includes controls and beliefs, Model (8) include controls and percent supportive jobs, and Model (9) includes all variables (controls, beliefs, and percent

supportive jobs). These models are all random-intercept models, meaning that effects are assumed to be the same in all countries (see Chapter 3 Methods section for an explanation).

Table 4.4. Within- and Between-Country Residual Variations from Random-Intercept Models of Overall Stigma Score, By Gender Group

#	Model Description	Sample Size: People (Countries)	Within-Country Variation	Between-Country Variation
Male Group		2,822 (17)		
(5)	Base (Empty) Model		534	73
(6)	Controls (Demographics, Contact)		523	67
(7)	Controls + Beliefs		497	57
(8)	Controls + % Supportive Jobs		523	48
(9)	Controls + Beliefs + % Supportive Jobs		497	43
Female Group		2,540 (16)		
(5)	Base (Empty) Model		528	147
(6)	Controls (Demographics, Contact)		507	129
(7)	Controls + Beliefs		487	110
(8)	Controls + % Supportive Jobs		507	95
(9)	Controls + Beliefs + % Supportive Jobs		487	82

Sources: Stigma in Global Context - Mental Health Survey (SGC-MHS), 2011/2012 Gallup World Poll, 2010 European Working Conditions Survey, Urban Livelihoods Study

All subsamples have been limited to respondents who have data for all of the variables used in all models.

The female group analyses do not include data from the Philippines.

Table 4.5. Fraction of Between-Country Variation in Country Mean Stigma Score Explained by Controls, Beliefs, and Percent Supportive Jobs, By Gender Group

	Conservative Estimate	Maximum Estimate
Male Group		
Controls (Demographics, Contact)		8%
Beliefs	7%	14%
% Supportive Jobs	19%	26%
Female Group		
Controls (Demographics, Contact)		12%
Beliefs	9%	13%
% Supportive Jobs	19%	23%

Sources: Stigma in Global Context - Mental Health Survey (SGC-MHS), 2011/2012 Gallup World Poll, 2010 European Working Conditions Survey, Urban Livelihoods Study

All subsamples have been limited to respondents who have data for all of the variables used in all models.

The female group analyses do not include data from the Philippines.

Table 4.5 uses the values from Table 4.4 to compute the fraction of between-country variation explained by controls (demographics and contact), beliefs (etiological, prognostic, and blame-related), and percent supportive jobs. There are two estimates given for each. This is because there is some confounding among the variables. The conservative estimates assume that all of the

variation explained that could be attributed either to the variable in question or to other variables in the model because of confounding is attributed to the other variables. The maximum estimates assume that all of it is attributed to the variable in question. This gives a range, a minimum and a maximum attributable percentage of variation explained.

First consider the male group. From Table 4.4, the between-country variation from the empty model (Model 5) is 73. This means that the unadjusted or raw distribution of countries' mean stigma scores is such that the variance of the scores is 73. The within-country variation (the between-people variation) is much higher at 534, giving an ICC of 12% (73/(73+534)). This is consistent with the ICC for the entire population found in Chapter 3. Accounting for demographics and contact experience (Model 6) reduced residual between-country variance from 73 to 67, a reduction of 8% ((73-67)/73). Accounting additionally for etiological, prognostic, and blaming beliefs (Model 7) reduces between-country variation further, to 57. Thus, the maximum estimate for the fraction of between-country variation explained by beliefs is 14% ((67-57)/73). This is the maximum estimate because it assumes that all of the variation that might be explained either by beliefs or by percent supportive jobs is explained by beliefs. The conservative estimate, 7% ((48-43)/73), is derived from comparing Models (8) and (9). This estimates assumes that all of the variation that can be explained either by belief or by percent supportive jobs is explained by percent supportive jobs. These computation results are shown in Table 4.5, along with the parallel computations for percent supportive jobs. Percent supportive jobs explains between 19% and 26% of the variation in countries' levels of public stigma, or roughly a fifth to a quarter of the variation. In contrast, beliefs differences explain only 7%-14%.

Using the same methods applied to the female group, I find that variation in percent supportive jobs explains between 19% and 23% of the variation in countries' levels of public stigma toward women. This is very similar to the amount explained for the male group. It is also noticeably higher than the amount explained by beliefs (between 9% and 13%).

Table 4.6 repeats the same computations for identical models, but with each of the three stigma sub-scores (Intolerance, Desire for Social Distance, and Role Exclusion) at the country level as the outcomes in distinct sets of models.

Table 4.6. Range in Fraction of Between-Country Variation in Country Mean Stigma Sub-Scores Explained by Controls, Beliefs, and Percent Supportive Jobs, By Gender Group

	Outcome: Intolerance	Outcome: Social Distance	Outcome: Role Exclusion
Male Group			
Controls (Demographics, Contact)	10%	31%	0%
Beliefs	5% — 11%	2% — 5%	7% — 14%
% Supportive Jobs	12% — 17%	7% — 10%	35% — 42%
Female Group			
Controls (Demographics, Contact)	7%	24%	10%
Beliefs	8% — 14%	8% — 13%	9% — 11%
% Supportive Jobs	12% — 17%	13% — 18%	32% — 34%

Sources: Stigma in Global Context - Mental Health Survey (SGC-MHS), 2011/2012 Gallup World Poll, 2010 European Working Conditions Survey, Urban Livelihoods Study

All subsamples have been limited to respondents who have data for all of the variables used in all models.

The female group analyses do not include data from the Philippines.

First consider the male group. Percent supportive jobs explains most about the variation in role exclusion, with over one third of its variation explained by cross-country variation in the availability of supportive jobs (35%-42%). This is about three times the proportion of either intolerance (12%-17%) or social distance (7%-10%) explained by percent supportive jobs. For each of the three sub-scales, percent supportive jobs explains a non-trivial fraction of the variation, and the fraction that it explains is larger than that explained by beliefs (etiological, prognostic, and blame-related). This is especially the case for role exclusion.

For the female group, conclusions are quite similar. Percent supportive jobs explains about a third of the variation in role exclusion (32%-34%), which is two to three times more than it explains for either intolerance (12%-17%) or social distance (13%-18%). In the case of the intolerance, while percent supportive jobs likely explains more of the cross-country variation in country mean score

than do beliefs, there is some overlap. For desire for social distance and role exclusion, percent supportive jobs explains more than beliefs. The contrast is especially strong for role exclusion.

Discussion

Existing literature on stigma is heavily focused on individual characteristics and beliefs as factors. Where that is not the case, the focus tends to be on how institutions enact or reinforce stigma. This has led to many calls for more research on how social roles and structures are implicated in the stigmatization of people with mental illness. However, there has been very little work on that subject. The objective of this chapter has been to add to the limited literature. It examined how one aspect of the structure of economies contributes to stigmatization of people with schizophrenia.

In the introduction, I characterized the standard employment relationship as inherently hostile to people with schizophrenia. It defines people with schizophrenia as unable to work. While there is only limited research on this point, existing studies suggest that most people are well aware of the difficulties that people with schizophrenia are likely to face in their attempt to become an employee. However, this is not the only form of work available to people. One can also be independently self-employed, a state which, because it involves much less inflexibility and dependence, I characterize as supportive for people with schizophrenia.

Countries' economies differ in the extent to which they make independent self-employment a possibility. In other words, they differ in the extent to which they have defined people with schizophrenia as unable to work. In countries where this is very much the case, the risks inherent in social connection to people with schizophrenia will be more salient. This is based on Yang and colleagues' understanding of stigmatization as related to "what matters most" for stigmatized and stigmatizers alike, and as a "highly pragmatic, even tactical response to perceived threats, real dangers, and fear of the unknown" (Yang et al, 2007, p. 1528). In a setting where one must become

employed in order to achieve economic self-sufficiency and hence satisfy key social role requirements, people with schizophrenia will be more socially threatening because they are defined as less able to accomplish this. In short, this chapter has proposed that countries with a smaller proportion of supportive jobs will exhibit higher levels of public stigma.

The analysis largely confirmed this hypothesis. Multi-level models indicated that stigmatization of men with schizophrenia is more pronounced in countries with a smaller proportion of supportive jobs. This is the case after controlling for respondent age, gender, education, minority status, and contact experience, vignette person minority status, and respondent beliefs about the etiology, prognosis, and blameworthiness of the vignette person's condition. On average, an increase of one percentage point in the prevalence of supportive jobs is associated with an approximately 0.9-point decrease in country mean stigma score.

The relationship is fairly large, statistically significant, and appears to be an important explainer of why countries have different levels of public stigma. Country differences in the prevalence of supportive jobs explain between 19% and 26% of the variance in country levels of public stigma. In contrast, differences in the prevalence of etiological, prognostic, and blaming beliefs explain only 7% to 14% of the variance. Given the very strong emphasis on individuals' beliefs that has characterized much of the literature, this particular finding may be important. It suggests that getting people to have "correct" beliefs about mental illness (or at least those concerning its etiology, prognosis, and blameworthiness) is simply not as important as, for example, making working more independent and flexible.

Country proportion of supportive jobs is negatively associated with stigmatization of men across all three dimensions of stigma, but most strongly with respect to role exclusion and least strongly with respect to desire for social distance. It explains around one-third of the variation in role exclusion scores, and roughly 10%-15% of variation in intolerance and desire for social distance. The differences in impact across sub-scales is a subject for future study.

Turning to the results for the female group, results are fairly similar. The main difference is that percent supportive jobs was not associated with a difference in intolerance of women with schizophrenia. However, there is a major caveat to the conclusions about the female group. While the results for the male group are quite robust, the results for the female group are more sensitive to inclusion and exclusion of specific countries (namely, Cyprus's inclusion and Philippines' exclusion). For this reason, the results for the female group should be treated with caution. However, if it is actually the case that there is no relationship between stigma and percent supportive jobs for the female group, this would not be a problem for the conclusions made here. A priori, one might expect weaker results for the female group given the lower importance of employment for women in many places.

There are several ways in which this analysis can be further developed in the future. First, it would be desirable to use the ILO measure of dependent and independent jobs when it becomes available. Second, the analysis would benefit from the inclusion of more countries. I expect this would be especially useful for clarifying the relationship for the female group. Third, this study has relied on a snapshot in time of different countries. A longitudinal analysis would strengthen the claim by reducing extraneous sources of difference that may be confounding. For example, these models do not include cultural differences that affect stigma, other than differences in beliefs about mental illness and the different effects that they have on stigma in different places. A longitudinal analysis essentially controls for culture by looking at one country through time. At present, although I have provided theoretical reasons, the claim of causality cannot be made. Fourth, it is possible that there is some dependency on the vignette in these results. The fact that the vignette person had a job and lost it as a result of illness is specifically mentioned, which may increase the importance of economic conditions to how the vignette person tends to be regarded. Fifth, it would be desirable to confirm the idea that the public believes a person with schizophrenia would have a hard time becoming an employee but is more likely to be able to work as a self-employed person. Finally, there

is room to do more studies of this type. Future studies should examine other aspects of economies or indeed of other social phenomena such as family structure, that may be involved in creating or increasing stigma.

Chapter 5. Conclusion

The central question of this dissertation is why the stigmatization of people with schizophrenia is more intense in some countries than in others. The vast majority of work explaining variation in mental illness stigmatization is focused on the individual-level effects of specific illness beliefs and experiences. One central claim is that biogenetic beliefs reduce stigmatization of people with schizophrenia because they reduce blaming and prognostic pessimism. I examined the evidence for this claim globally, identifying both the average relationships among these elements and the fact that relationships differ by place. Then, based on the analysis of which individual-level characteristics are important for explaining differences in stigma intensity among individuals, I considered whether differing prevalences of these same characteristics can explain why countries have such different levels of public stigma. Finally, I proposed that the set of reasons why one country has higher stigma scores than another is not reducible to the differences in this individual-level characteristics. Instead, it is necessary to consider how social structures promote stigmatization of people with schizophrenia more intensively in some contexts than in others. Specifically, I formulated and tested the hypothesis that economies that provide more opportunity for a person to work as an independent self-employed person rather than as an employee result in less intense stigmatization of people with schizophrenia in those countries. Finally, I concluded with a comparison of the explanatory value of individual characteristics versus this country-level characteristic.

Chapters Review

This section gives an overview of the results by chapter.

Chapter 2

The objective of Chapter 2 was to understand the relationships between etiological, prognostic, and blaming beliefs and stigma at the individual level, especially if and how these relationships vary internationally. In addition to being of independent interest, it is also a necessary first step in order to achieve later goals regarding explaining international variation in levels of public stigma.

Results showed that biogenetic beliefs are associated with more stigma, not less. Within the broader category of biogenetic beliefs, there were important distinctions observed between biomedical beliefs and biopsychosocial beliefs about the causes of schizophrenia. Biomedical believers tended to have the highest stigma scores, but whether the stigma scores of biopsychosocial believers were also high depends on the country context. In developing countries, there was no statistically significant difference between the two groups, but in developed countries, biopsychosocial believers tended to have much lower stigma scores than biomedical believers. Future studies may wish to investigate why this is the case. However, it does point to a point which is rarely acknowledged: the effect of a given belief can differ by context. This is one reason why one-size-fits-all education may not be useful for stigma reduction. These results suggest that techniques that may reduce stigmatization in one country will not do so in another.

Similar complexities are found with respect to blaming and prognostic pessimism. A standard argument is that framing schizophrenia as a disease like any other reduces blaming, which either reduces stigma or, in some tellings, is part of stigma. Similar arguments are made regarding prognostic pessimism. However, results do not confirm these arguments. In general, prognostic pessimism and blaming are indeed associated with higher stigma scores. But in many countries, biogenetic believers are just as likely or more likely to blame V than others and they are more likely to express prognostic pessimism. This is not the case in every country, but for at least half of countries, relationships are not as expected. As a result, it is not surprising that blaming and

prognostic pessimism are at best weak mediators of the relationship between biogenetic beliefs and stigma.

Chapter 3

The objectives of Chapter 3 were to describe international differences in levels of public stigma, characterize their significance, and evaluate the extent to which they can be explained by dissimilarities in the distribution of individual etiological, prognostic, and blaming beliefs in each country.

In Chapter 2, the outcome was a person's stigma score. The objects of interest in the analysis were the individual-level effects of a given belief or characteristic, and the variation in those effects. In Chapters 3 and 4, the outcome is the mean stigma score of all the people in a given country, the country's level of public stigma. The first object of interest in the analysis was the variation in the outcome in the population. While an extensive literature describes stigmatization in particular country contexts, and there are some studies that compare stigma or stigma-related outcomes across countries, almost all of these only compare a few countries at most and/or do not include developing countries and/or do not take stigma specifically as their focus. As a result, a meaningful quantification of the variation in stigma across countries has not occurred. While the SGC-MHS is not a random sample of countries and hence cannot claim to provide an accurate estimate of the true world-wide variation, the estimates offered here increase our knowledge of this variation in three ways: they include developing countries, they constitute a larger sample than the vast majority of other estimates, and they deal directly with stigmatization rather than discrimination, self-stigma, or other stigma-adjacent outcomes.

Consistent with expectations, the analysis suggested a large and meaningful variation in stigmatization across countries. This is true in several ways. First, the variation in country stigma scores is large, with an expected range of 27 to 71. Second, although individuals' stigma scores vary

dramatically from each other regardless of which country a person happens to reside in, the country that a person resides in does have a strong effect. Chapter 3 analysis estimated that around 18% of the observed variation in stigma scores among individuals is due to the fact that they reside in one country versus another.

One interesting result that deserves further study elsewhere is that the grouping of respondents into countries explains the most about role exclusion and least about desire for social distance. One possibility is that whether role exclusion is a reaction to stigma is culturally dictated, whereas desire for social distance is more cross-culturally valid as a measure (which would imply that stigma variation across countries is lower than it appears). One argument against this is the finding in Chapter 4 that more of the variation in role exclusion than in desire for social distance is explained by variation in availability of supportive jobs across countries. If it were a cultural artifact that would be a less likely although still possible coincidence. Another potential explanation is that stigma reactions have a nested structure: almost everyone responding to stigma will express desire for social distance, people with more intense stigma feelings will additionally express intolerance, and then people who feel the most strongly will additionally find role exclusion to be appropriate. If this were true it would have the effect of amplifying differences among countries with respect to role exclusion and minimizing it with respect to desire for social distance. However, mean stigma sub-scores in each country suggest that this is also not true (or at least not true everywhere). If it were, then countries should consistently have higher desire for social distance mean sub-scores than role exclusion mean sub-score, but a little under half of countries do not follow this pattern. The reasons for this finding remain to be investigated.

Returning to the main points, Chapter 3 finds large and significant differences in the stigmatization of people with schizophrenia across countries. What can explain these differences? And especially, how much of a role do differences in the prevalence of specific beliefs about schizophrenia explain? This latter question is important because of the dominant focus on beliefs in

the literature. Many if not most quantitative studies are devoted to understanding how etiological, prognostic, and blame-related beliefs translate into higher or lower levels of stigmatization at the individual level. Chapter 2 examined these questions at the individual-level and found that all three types of beliefs are relevant to why a particular person has a higher stigma score than another person. Chapter 3 now asks whether these effects "roll up" to constitute differences in levels of public stigma between countries. In other words, is the reason why country X seems to have so much more intense stigmatization of people with schizophrenia than country Y because people in country Y have a particular set of beliefs about schizophrenia that makes stigma more intense there? This question is asked with respect to the three kinds of beliefs that are prominent in the literature: etiological beliefs, prognostic beliefs, and blaming beliefs.

Cumulatively, all individual-level characteristics (demographics, contact experience, etiological beliefs, prognostic beliefs, and blaming beliefs) explain nearly a quarter of the variation in country levels of public stigma. However, about a third of this explanation is due to contact experience alone. Because this element is most open to the charge of reverse causation, its contribution should be considered with caution. Perhaps the most interesting finding is that the individual-level characteristic that has been the focus of the most consuming attention in the field, etiological beliefs, explains only 6% of country-level variation in stigma. In other words, even if everyone in every country were convinced to have the same understanding of the origins of schizophrenia, countries would still have dramatically different levels of public stigma: many countries would still have very high stigma scores. The importance of prognostic and blaming beliefs is even smaller: 3.4% and 1.4% respectively. This casts some considerable doubt on the worth of education programs in reducing worldwide stigmatization of people with schizophrenia, regardless of which particular set of beliefs they choose to export.

An important caveat to this conclusion is that for statistical reasons, the variation in individual-level effect of a given belief in a given place was not considered. The fact that these

variations exist was an important conclusion from Chapter 2. However, I have tried to minimize this by allowing the effect of beliefs to vary by development status where the interaction was found to be significant in Chapter 2. This reduces the unaccounted-for cross-country variation in effect size quite a lot for most beliefs. For this reason, although ideally future studies would investigate this, I do not expect that accounting for this variation more completely would change the central conclusion: individuals' characteristics and beliefs do explain quite a lot about cross-country variation in levels of public stigma, but whether people in one country tend to have one particular etiological belief over others is not a particularly important factor.

Chapter 4

In Chapter 4 I pursued the idea that characteristics of countries, in addition to characteristics of the individuals in those countries, affect levels of public stigma. The country-level characteristic of interest is not derived from the individual level, but only exists at the group level. Specifically, this chapter related the higher relative availability of independent self-employed work in a country's economy to lower levels of stigmatization.

Drawing on Yang and colleagues, I treat stigma as derived from the sense engendered in others by their understanding of how society functions that the person before them will not be able to perform key social role requirements: to do "what matters most" and allow the people connected with them to do "what matters most" as well. For this reason, the stronger the perception that a person with schizophrenia will not be able to do this, the more stigmatized one can expect their condition to be. However, the perception of what a person with schizophrenia can and cannot do is not solely about what the stigmatizer's perception of what the person with schizophrenia is like, but also about social realities as they appear to the stigmatizer. In this chapter I examined one particular aspect of social reality that has a bearing on role fulfillment: specifically, I consider the availability of independent, flexible (supportive) work.

I described the standard employment relationship as inherently dependent and inflexible (hostile), which results in the exclusion of people with schizophrenia. I suggest that most people are aware of this fact about employment. They likely do not know exactly how employers usually feel about people with schizophrenia specifically, but they are quite likely to know how employers feel about people who have previously been fired, who require special accommodation, who have "other imperatives of existence" (Acker, 1990, pg. 149), or who carry a perceived riskiness that others do not. Thus, they may believe that a person with schizophrenia has little chance of working as an employee. In fact, the evidence strongly supports this: the employment rates of people with schizophrenia is less than 20% in most countries.

However, being an employee is not the only way in which a person can earn a living: a person can also work for themselves, as a small employer, large employer, or member of the petty bourgeoisie. In countries where this way of earning a living is easier to accomplish and is more common, it will appear more immediately as an option for the vignette person in the eyes of the respondent (unfortunately this claim cannot be checked explicitly using this data; ideally, future studies should investigate this explicitly).

The analysis does show a fairly large and statistically significant relationship between the extent to which a country's economy provides supportive work and lower levels of public stigma in that country. This is most true for men, with the findings for women being more nebulous. This gender difference is consistent with expectations, given the generally lesser importance of working for women's role fulfillment. Furthermore, this characteristic of countries explains around 20-25% of the variation in levels of public stigma directed towards men. One can compare this with the explanatory value of individuals' etiological, prognostic, and blame-related beliefs, which cumulatively explain between 7% and 14%, making people's beliefs a much less important factor in public stigma levels than availability of supportive jobs (again, for men).

Implications

The central findings from this dissertation are:

1. *Medical understandings of schizophrenia do not reduce stigmatization.* No support was found for the claim that individuals with a medical understanding of schizophrenia express less intense stigmatization. Respondents who identify the vignette person's problems as a mental illness, attribute its cause to a brain disease and/or genetics, and/or believe schizophrenia cannot improve on its have higher stigma scores than otherwise similar people from their own country.
2. *Biomedical beliefs have very different stigma effects than biopsychosocial beliefs.* Within the category of "biogenetic etiological beliefs", the most biological explanations are associated with the most stigma: biomedical beliefs are associated with much higher stigma scores than biopsychosocial beliefs in developed countries, and with equal stigma scores in developing countries. This result points to the necessity of making at least this level of differentiation among etiological beliefs in future studies. Not making this distinction leads to an underrepresentation of the stigma-related effects of the biomedical model.
3. *The effect of a given belief cannot be assumed to be the same in all places.* Although it is possible to point to general relationships between biogenetic beliefs and stigma, blaming and stigma, and prognostic pessimism and stigma (all of which are positive on average), relationships vary quite a lot across countries. In other words, beliefs effects as well as belief distributions vary from country to country.
4. *The standard argument relating beliefs, blaming, and prognostic pessimism is neither universally nor even generally true.* In many countries, biogenetic believers are more likely to blame V and to be pessimistic about her prognosis. Furthermore, blaming and prognostic pessimism are at best weak mediators between biogenetic beliefs and stigma. Combined with the finding that biogenetic beliefs are expected to be associated with higher levels of stigma practically

everywhere, these results are more consistent with the claim that the essentialist effects of holding biogenetic beliefs are the dominant factor in its relationship with stigma.

5. *Differences in country mean stigma scores deserve additional study.* Turning to country-level outcomes, I observe that international differences in levels of public stigma are large, and the effect of belonging to one country rather than another seems to be quite an important driver of a person's stigma score. The vast majority of the literature is focused on explaining differences between individuals, but this ignores a large source of variation (the countries themselves) and has the effect of limiting explanations of stigmatization to the content of individual minds.
6. *Difference in the distribution of individual characteristics among countries explains a great deal of why countries differ from each other, but areas of intense focus such as etiological beliefs explain very little.* Differences in the distributions of individual-level characteristics and beliefs are only part of the reason why countries differ. Cumulatively, these individual-level differences do explain as much as a quarter of the variation, but etiological beliefs which have been an area of such intense focus in the literature, explain surprisingly little of this cross-country variation (around 6%). The strongest individual-level explainer is variation in contact experience (8%), although this factor is most open to claims of reverse causation.
7. *Availability of supportive jobs, a characteristic of countries' economies is a much stronger explainer than any individual-level characteristic considered.* The degree to which that country's economy provides the opportunity to work as an independent self-employed person rather than as, for example, an employee explains between 19% and 26% of the variation in levels of public stigma directed against men with schizophrenia. It explains as much about cross-country variation in levels of public stigma as do all individual-level characteristic combined (15%-22% from men), and explains noticeably more than all beliefs about schizophrenia combined (7%-14%).
8. *Countries where independent self-employment is more common have lower levels of public stigma.* For each one percentage-point increase in the fraction of jobs that are independent self-employed, there is a

nearly 1-point decrease in a country's public stigma score. This result persists after controlling for all individual characteristics considered in this dissertation: respondent and vignette person demographics, contact experience, etiological beliefs, prognostic pessimism, and blaming.

Issues

There are several ways in which this analysis can be further improved in the future. Those which are specific to each chapter have already been mentioned. Others which I discuss here are applicable to the whole.

First, the set of countries in the SGC-MHS is not a random sample of the entire population of countries. Although this is a common problem with studies that use multi-level models (Wang, Xie, and Fisher, 2011), it does mean that estimates of cross-country variation in levels of public stigma, coefficients for specific beliefs, and intraclass correlation coefficients cannot claim to be true representations of the global situation. This is especially the case given the relative underrepresentation of developing countries (although this study does include a much higher proportion of developing countries than most cross-national studies) and specifically of low-income countries. Bangladesh is the only low-income country in the dataset, and as of 2016 it is considered a lower-middle income country (World Bank, 2020). Ideally, future studies would include data from a wider swath of countries selected at random.

Second, there are a variety of measurement issues that can be raised. First among these is the question of the measurement of stigma itself. Since the stigma score is composed of specific questions, it is possible that these specific questions influence individual stigma scores and levels of public stigma in countries. I think this is especially possible with respect to stereotypes. In a given country, a particular stereotype may have no currency while another has quite a lot, and the situation could be reversed in a different country. If one of these stereotypes is represented in the scale and the other isn't it could distort the perception of the relative levels of public stigma in the two

countries. I also noted in Chapter 2 that prognostic pessimism is accurately but partially measured: it seems desirable in future to ask respondents if the vignette person could be cured. This impacts both the effect size for prognostic pessimism and its contribution to cross-cultural variation in levels of public stigma. Similarly, the question for blaming is not ideal: respondents should be asked if they think it is the fault of the vignette person that she is experiencing these problems.

The etiological categories I used in this dissertation do not have as much granularity as they could. This is especially the case for the nBP (neither biomedical, biopsychosocial, nor psychosocial) category, although I think the effect of this on the main findings is minimal given that nBP believers represent very small fractions of respondents in every country. Perhaps more significant is the possible variation in meaning in the BP (biopsychosocial) category. There are multiple possibilities for what respondents mean when they say, for example, that the vignette person is experiencing a brain disease caused by stress. They might mean that the person is experiencing the result of a physiologically disordered brain organ with the symptoms simply triggered by a stressful event. In this case, the more fundamental cause is the person's flawed biology. Or, they might mean that the person's brain disease is the result of a perfectly normal person (psychologically and physically) being subjected to extreme and ongoing stress, resulting in physiological damage[1]. In this case, the more fundamental cause is the stress. There may be other meanings as well. It is quite possible that these they have different implications for stigma. As a result, it may be that the variation in levels of public stigma due to etiological beliefs is larger than it appears in this analysis. Relatedly, a variety of etiological beliefs shown to be prevalent in some places (e.g., witchcraft; Razali, Khan, and Hasanah, 1996; Stefanovics, He, Cavalcanti, Neto, et al., 2016) have no representation in this survey. While I believe that the categories used here are an

[1] Read, Fink, Rudegeair, Felitti, et al. (2008) make the argument that the biopsychosocial model as the term is used in medical circles is actually still just a "bio-bio-bio" model.

improvement on the existing standard of "biogenetic vs. not", future studies will ideally allow for further refinement and exploration of what categories really matter for stigma.

Third, the dataset used is cross-sectional rather than longitudinal. Longitudinal data would strengthen a causal argument, whereas this dissertation only observes associations. While I propose theoretical arguments in favor of it, the data cannot support claims of causation. In addition, some arguments made are more prone to the accusation of confounding which would be reduced by the use of longitudinal data. One of these is the claim that wider availability of supportive jobs is associated with lower levels of public stigma. Using data from the same country over time would have the effect of controlling for variables that it was not possible to consider here such as cultural or legal factors that are difficult to measure. Not all confounders can be addressed by a longitudinal analysis, and there are many potential confounders that any given analysis will miss. However, a follow-up data collection effort to SGC-MHS or a series of follow-ups would be very useful for remedying these problems.

Future Directions

Several questions were raised but not answered in this dissertation, which could be studied in the future. One of these is the distinctions found among the stigma sub-scores. For example, I observed that there are more prominent differences in country-level role exclusion scores than in country-level social distance scores, and that individual characteristics and beliefs explain these to a different extent. Similarly, country availability of supportive jobs explains cross-country variations in these sub-scores to a different extent. It could be interesting to see why that might be.

A much larger and probably more important question raised is what other characteristics of countries can explain cross-country variation in levels of public stigma? I examined only two in this dissertation: development status (which explained very little), and availability of supportive work (a much stronger explainer). Undoubtedly there are others. I hope new work will consider other

aspects of countries' economies and other ways in which the higher-level structuration of the social world influences the stigmatization of people with schizophrenia.

In general, I believe that the results of this dissertation point to a need for research to move away from a focus on what individual people believe about schizophrenia. It does not seem useful to try to change beliefs, a difficult task, if the maximum effect that that can have on stigma seems in general to be so small. It also does not seem to be worthwhile to continue to emphasize understandings that if anything seem to increase stigmatization, such as biological views of schizophrenia that treat it primarily as a brain disease rooted in genetics. More fundamentally, it seems limiting to continue to regard stigma primarily as a reaction to stereotypical beliefs or particular understandings of mental illness. I join others in pointing to the need to refocus our understanding of stigma as a societal-level phenomenon. Moving away from positioning stigma solely in the minds of individuals enables scholars to look at social structures and roles. This in my view has tremendous potential as a way forward.

Appendix A. Literature Review of Control Variables

Respondent Demographics

The evidence relating sociodemographic characteristics to mental illness stigma tends to be rather inconsistent and generally weak, and is also primarily derived from studies in Western countries.

Older age has sometimes been associated with more stigmatizing attitudes, but not consistently across studies in a given country or across countries. One review (Jorm and Oh, 2009) concluded that the preponderance of the evidence is in favor of an association between age and stigma, and another (Pescosolido, 2013) that it is not.

With respect to the respondent's gender, reactions to people with mental illness tend to follow gender norms. Holzinger, Floris, Schomerus, Carta, et al.'s (2012) systematic review of Western countries reports that women are more likely to volunteer to care for, less likely to express anger toward, and more likely to show fear toward people with mental illness than are men. However, they report no consistent gender effect on desire for social distance, with studies variously finding no difference, positive difference, and negative difference in stigma responses between male and female respondents. A non-systematic review that included studies in non-Western countries reached similar conclusions (Jorm and Oh, 2009).

Education level and other indicators of socioeconomic status are only "rarely significant" (Pescosolido, 2013). Corrigan and Watson (2007) found that Americans with more education were less likely to view those with mental illness as dangerous, but neither more nor less likely to feel angry with the person or to hold them responsible for their illness. A German study (Angermeyer and Matschinger, 1997) found that higher education was associated with less desire for social distance, but that the effect did not achieve significance. As with race, non-Western research

is extremely limited. Overall, the evidence of a relationship between socioeconomic status and levels of stigma is scarce and inconclusive.

Racial/ethnic differences in stigma attitudes have also occasionally been found. In the US, Whaley (1997), Corrigan and Watson (2007), Abdullah and Brown (2011), and Anglin, Link, and Phelan (2006) found that non-white respondents tend to express more stigma than white respondents. Corrigan, Edwards, Green, Diwan, and Penn (2001) reached the opposite conclusion. However, there has overall been very little work on this question, especially in non-Western countries.

Measuring race or ethnicity in health inequalities research presents a variety of problems even within a given country (Aspinall, 2001). When the dataset is cross-national, difficulties become even more prominent. Hall (1997) characterizes race as a "floating signifier", meaning that "race is not fixed but relational and subject to redefinition in different cultures" (Telles, 2006, pg. 79). Categories that have a certain meaning in one place have a quite different meaning elsewhere[1], or while extremely salient in one context have no social relevance in another[2].

Aspinall states that race/ethnicity's "contingent, complex and labile nature demands that the means of measurement should be related to the purpose of the research" (Aspinall, 2001, pg. 853). In this setting, the purpose of controlling for race or ethnicity is primarily to avoiding confounding with other variables in a cross-national analysis. What race is really standing in for in this context is a more privileged or a more disadvantaged social position. Therefore, rather than using specific racial or ethnic categories, whose social salience and relative positioning differ across countries, I use majority/minority as a race measure. This approach is consistent with how the SGC-MHS

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[1] A comparison between the US and Brazil provides a good example of this. In the US, blackness is still roughly determined by the "one drop rule" (Khanna, 2010) although this may be changing (Roth, 2005). However, in Brazil, many people with African ancestors are considered to be white. This difference is discussed in Telles (2006, pg. 1).

[2] For example, the divide between highland and lowland Filipino ethnic groups is social irrelevant in the US, but not in the Philippines (May, 2003).

attributed race to the vignette person (described below). The translation from the specific racial and ethnic categories used in each country to the majority or minority category is given in Appendix B.

Thus, in general, most studies find little to no relationship between respondent demographics and stigma, but there is also not much work on the subject in non-Western countries. To follow standard practice and to avoid any potential confounding, I include age, gender, socioeconomic status, and minority/majority status in all models.

Vignette Person Demographics

In this survey, the race/ethnicity and gender of the vignette person were implied by the name used in the vignette, leading to four types of vignette person: male & in-group, male & out-group, female & in-group, female & out-group. For example, the US vignette names were John (in-group, male), Mary (in-group, female), Tyrone (out-group, male), Shontell (in-group, female). Vignette versions were assigned at random to each respondent so that each vignette type was given to a quarter of the population of each country.

Several theoretical perspectives predict that members of racial or ethnic minorities will experience different and more severe stigmatization than members of the majority group(s). Modified Labeling Theory (Link and Phelan, 2001) proposes an intrinsic connection between the stigmatization of a group and its inability to resist this process by virtue of social power or status. This suggests that people with a mental illness who are also in a minority racial group will experience more stigmatization because they presumably have less power to resist. Gary (2005) introduced the concept of "double stigma", which she defines as "discrimination based on minority group status and the burden of having to live with a mental disorder" (pg. 981). It may be difficult to distinguish between the stigmatizing attitudes due to minority membership and those due to mental illness.

The concept of intersectionality (Crenshaw, 1989) suggests that they may not truly be separable: the nature and degree of stigma attached to the combined race/mental illness identity

may not simply be an additive combination of race-based stigmatization and mental illness-based stigmatization. The work on intersectionality in stigma research has been dominated by studies on HIV/AIDS (Jackson-Best and Edwards, 2018), but the concept is sometimes applied within studies of mental illness stigmatization alone and more frequently where it interacts with HIV/AIDS stigma (e.g., Collins, von Unger, and Armbrister, 2008).

The same theories that predict that members of racial/ethnic minority groups will experience more stigma also predict higher levels of stigmatization for women. However, results in Western countries tend to suggest the opposite. For example, studies in USA (e.g., Schnittker, 2000; Martin, Pescosolido, Olafsdottir, and MacLeod, 2007; Mukolo & Heflinger, 2011), Scotland (e.g., Braunholtz, Davidson, Myant, and O'Connor, 2007), Australia (e.g., Jorm and Griffiths, 2008), and Germany (Angermeyer, Matschinger, and Holzinger, 1998) have found that people tend to desire more social distance from men with schizophrenia than from women. Holzinger, Floris, Schomerus, Carta, et al. (2012) suggest that this may be because men are likely to be seen as more dangerous than women, a belief which amplifies or is amplified by the common mental illness stereotype of dangerousness. This more privileged position of women is, however, not universal. For example, Indian studies often note that women with schizophrenia, depression, and other mental illnesses experience more stigma than men (Raguram, 2015; Thara & Srinivasan, 2000). I speculate that the relative salience of gender role violations and women's social status influence whether women with mental illnesses are less stigmatized than men, but cannot test this here.

Contact

Interpersonal contact (Allport, 1954) has been studied as a technique for reducing prejudice against many groups, including people with mental illness (see Pettigrew, Tropp, Wagner, and Christ (2011) for a review of 515 studies on a variety of groups). Corrigan and Penn (1999) have categorized stigma-reduction techniques for mental illness into contact, education, and protest.

Pescosolido and Manago (2018) describe as "well-established" the conclusion that contact reduces mental illness stigma.

Recent meta-analytic studies have concluded that contact generally has an inverse relationship with stigmatizing beliefs. Corrigan, Morris, Michaels, Rafacz, et al.'s (2012) meta-analysis of 72 studies from 14 countries found that contact with a person with mental illness had a small but statistically significant effect on overall stigma, although not on negative affect. In a meta-analysis of 62 experimental studies, five of which were from Asian or South American countries, Morgan, Reavley, Ross, Too, et al. (2018) found small but statistically significant reductions in various stigma measures immediately after contact with people with severe mental illness (although these effects were non-significant at follow-up).

However, the impact of contact on mental illness stigma (e.g., Reinke, Corrigan, Leonhard, Lundin, et al., 2004; Stephan & Stephan, 1996; Pescosolido and Manago, 2018) and on other stigmas (e.g., Blundell, Das, Potts, and Scior, 2016; Amir, 1976; Ellison & Powers, 1994) has been found to vary with the quality of the contact and closeness of the relationship. Cultural context may also have an effect (Yang, Lo, WonPat-Borja, Singla, et al., 2012), which is a question that, like cross-country variation in belief effects, has been under-explored.

Appendix B. Categorization of Race/Ethnicity Groups

In the fielded survey, race and ethnicity categories were country-specific. In order to create comparability to the extent possible, I have organized these groups into either majority or minority. While I call the categories "majority" and "minority", they do not necessarily imply actual numerical majority. Rather, the divide is intended to capture relative social status. Naturally this is an oversimplification of the often complex race/ethnicity groupings and their relationships, but simplification is necessary in order to allow multi-country analyses: divides that are extremely pressing in some countries have no meaning in others. The allocation of each country's racial and ethnic groups into the majority or minority category is shown below.

Argentina

Majority: White (91%)

Minority: Black (2%), Asian (1%), Aboriginal (3%), Other (3%)

Bangladesh

Majority: Bengali (100%)

Belgium

Belgian respondents were not asked about their race or ethnicity. However, they were asked about the country of their birth, and that of their parents and grandparents. I categorized all respondents whose grandparents, parents, or themselves were born abroad (not in Belgium) as minority (17%) and all those born in Belgium as majority (83%). Places where respondents or their relatives were born abroad include Turkey, Morocco, the Netherlands, Congo, Czech Republic, France, Germany, Greece, Guinea, Italy, Lebanon, Poland, Ukraine, Slovakia, Suriname, and Zaire.

Majority: born in Belgium (83%)

Minority: not born in Belgium (17%)

Brazil

The Brazilian census does not collect race data but does collect "color" data (Instituto Brasileiro de Geografia e Estatistica, 2010) using five categories: white, brown (*pardo*), black, Asian, and indigenous. Similar categories were used by the SGC-MHS. Telles (2006) argues that it is not possible to cleanly map Brazilian color concepts onto American ideas about race. However, despite significant ambiguity in the "brown" category, he concludes that the salient divide in Brazilian society is between whites and non-whites. Following this, I classify whites as the majority, and all other race groups as minority. The mixed race category used here is socially ambiguous, but the tendency Telles found toward "whitening" (i.e., choosing to classify oneself as white rather than brown or black) in his study suggest that respondents to this survey who use the mixed race category are choosing to identifying with a less-privileged color group.

Majority: White (45%)

Minority: Black (12%), Asian (2%), Aboriginal (4%), Mixed Race (37%)

Bulgaria

Majority: Bulgarian (84%)

Minority: Turk (10%), Gypsy (5%), Bulgarian-Muslim (2%), Other(<1%)

China

Majority: Han (95%)

Minority: Mongolian (<1%), Manchu (<1%), Hui (1%), Zhuang (<1%), Other (3%)

Cyprus

Majority: Cypriot (100%)

Germany

Majority: White (99%)

Minority: Asian (<1%), Other (<1%)

Great Britain

Majority: White (87%)

Minority: Black (3%), Asian (6%), Other (11%)

Hungary

Majority: Hungarian (99%)

Minority: Gypsy (1%), Other Ethnicity/Nationality (<1%)

Iceland

Majority: White (99%)

Minority: Other (<1%)

South Korea

Majority: Korean (99%)

Minority: Japanese (<1%)

New Zealand

Majority: White (71%)

Minority: Maori (13%), Pacific Islander (7%), Chinese (4%), Indian (2%), Other (3%)

Philippines

Respondents from the Philippines were asked to list their ethnic affiliation. The main ethnic divisions are between lowland groups, highland/indigenous groups, and Muslims (May, 2003), with the later two groups being both numerically smaller and less privileged. Therefore, I have categorized all members of lowland ethnic groups as majority members, and all highland ethnic group members and members of majority Muslim ethnic groups as minority members.

Majority (total: 92%): Aklanon, Bicolano, Boholanon, Cavitea, Cebuano (22%), Chabakano, Ibanag, Ilocano, Ilonggo (11%), Kapampangan, Pangasinense, Panggalatok, Subanin, Tagalog (30%), Visaya/Bisaya, Waray

Minority (total: 8%): Aeta, B'Laan, Buruanganon, Davaueo, Ifugao, Igorot, Kalagan, Maranao, Tausog

South Africa

The South African census (Statistics South Africa, 2001) groups people into five race categories: Black African, White, Coloured (roughly meaning "more than one race"; Hendricks, 2004), Asian (predominantly Indian), and Other. This survey did not ask about "Coloured" as a category, but it is likely that people who identify with this racial/ethnic grouping are included as Other in this survey: the South African census of 2011 recorded 9% Coloured which is close to the 7% Other recorded in this survey. While Black Africans are the most prevalent racial group in South Africa, I have labeled whites as the majority in this country: they experience advantages such as higher income, lower rates of HIV/AIDS infection, and longer life expectancy (Gilbert and Walker, 2002), as well as higher life satisfaction (Ebrahim, Botha, and Snowball, 2013).

Majority: White (13%)

Minority: Black (78%), Asian (2%), Other (7%)

Spain

In this study, Spanish respondents were not asked about their race group. Instead they were asked about their linguistic affiliation.

The history of the Spanish state has been characterized as a "pendulum-swing between centrifugal and centripetal forces" (Trotsky, 1931; quoted in Beswick, 2007). The former is the push toward separate and even politically autonomous regions, and the latter is the countermovement toward centralization and unification of regions into a single state. Regional groups are defined territorially, but also culturally and especially linguistically (Beswick, 2007), with Castilian Spanish considered politically and socially dominant. Therefore, respondents who indicated that they spoke regional languages more often than Spanish were categorized as minority, and respondents who spoke Spanish as or more often than regional languages have been characterized as majority. In addition, ten respondents indicated that this question did not apply to them, suggesting a non-Spanish linguistic affiliation. I have coded these respondents as minority as well.

Majority (total: 80%): As Much Regional As Spanish (58%), More Spanish than Regional (7%), Only Spanish (15%)

Minority (total: 20%): Only Regional Language (4%), More Regional than Spanish (13%), Does Not Apply (3%)

USA

White, Black, and Other categories were themselves agglomerations of other data collected on race and ethnicity. Respondents were asked about race, and could provide up to three race categories from the set White, Black or Africa American, American Indian or Alaska Native, Asian Indian, Chinese, Filipino, Japanese, Korea, Other Asian, Other Pacific Islander, and Hispanic. Combining these results together, three major categories were created by the SGC-MHS: White, Black, and Other. Twenty-five out of 27 people who listed Hispanic as one of their race categories were categorized as Other, and all people who listed a category other than White, Black, or Hispanic as one of their race categories were marked as Other.

Majority: White (75%)

Minority: Black (18%), Other (8%)

Appendix C. Categorization of Countries by Development Status

There is no strictly agreed-upon categorization of countries by development status, and different organizations use different criteria. In Table C.1 I give the relevant categorizations for each country from four organizations: World Bank, United Nations, International Monetary Fund, and Central Intelligence Agency. For 14 of 17 countries, there is no obvious conflict among the four. The UN marks most countries as Developed that the IMF characterizes as Advanced, the World Bank terms High Income, and the CIA called Developed. Similarly, the UN marks most countries as Developing that the IMF calls Emerging, the World Bank terms Upper or Lower Middle, and the CIA calls Developing. For the countries where there are conflicts (shown in bold in the table), I have generally privileged the economics-based definitions (World Bank, IMF). The UN considers South Korea to be a developing country, but the IMF considers it to have an advanced economy, so I treat it as a developed country. For Bulgaria and Hungary, countries which are "in transition" according to the IMF but developed according to the UN, I marked Bulgaria as developing and Hungary as developed. This is because the World Bank classifies Bulgaria as a middle income country, and all the other middle income countries in this dataset are developing.

Table C.1. Development Status Categorizations and Four Sources					
Country	Treat as Developed?	World Bank	United Nations (UN)	International Monetary Fund (IMF)	Central Intelligence Agency (CIA)
Argentina	N	Upper Middle	Developing	Emerging	Developing
Bangladesh	N	Low	Developing	Emerging	Developing
Belgium	Y	High	Developed	Advanced	Developed
Brazil	N	Upper Middle	Developing	Emerging	Developing
Bulgaria	N	Lower Middle	Developed	Emerging	Former USSR/EE
China	N	Upper Middle	Developing	Emerging	Developing
Cyprus	Y	High	Developed	Advanced	Developing
Germany	Y	High	Developed	Advanced	Developed
Great Britain	Y	High	Developed	Advanced	Developed
Hungary	Y	High	Developed	Emerging	Former USSR/EE
Iceland	Y	High	Developed	Advanced	Developed
New Zealand	Y	High	Developed	Advanced	Developed
Philippines	N	Lower Middle	Developing	Emerging	Developing
South Africa	N	Upper Middle	Developing	Emerging	Developed
South Korea	Y	High	Developing	Advanced	Developing
Spain	Y	High	Developed	Advanced	Developed
USA	Y	High	Developed	Advanced	Developed
Sources: United Nations (2020), International Monetary Fund (2018), World Bank (2020), Central Intelligence Agency (2020)					

Appendix D. Details on Measuring Prevalence of Supportive Jobs

Ideally, one could identify a job as hostile based on whether it offers a position of dependence and inflexibility, and as supportive if it offers independence. However, there is very little data on how many jobs in a country are dependent or independent.

According to an International Labor Organization (ILO) resolution adopted in 2018 (ILO, 2018), the ILO will (but does not currently) categorize workers as dependent or independent based on "nature of the control that the worker has over the organization of his or her work, the nature of authority that he or she exercises over the economic unit for which the work is performed (including its activities and transactions), and the extent to which the worker is dependent on another person or economic unit for organization of the work and/or for access to the market" (pg. 3). Specifically, the following are considered to be independent workers under the new standard (ICSE-18-A):

(1) owner-operators of corporations and

(2) own-account workers in household market enterprises.

The following are considered to be dependent workers:

(3) dependent contractors,

(4) employees, and

(5) contributing family workers.

Dependent contractors are defined as those who are not employees but who are "dependent on [another economic] unit for organization and execution of the work, income, or for access to the market" (pg. 7).

Workers who are not employees but are still dependent may be called "dependent contractors" as they are in the ILO standard, "dependent self-employed" (e.g., Williams and Lapeyre, 2017; Muehlberger, 2007; Oostveen, Biletta, Parent-Thirion, and Vermeylen, 2013), "bogus

self-employed" or "false self-employed" (e.g., Vershinina, Rodgers, Ram, Theodorakopoulos, et l., 2018; Thörnquist, 2015; Heyes and Hastings, 2017), or "disguised employed" (ILO, 2016)[1]. For these workers, their relationship with another economic entity closely resembles that of an employee. They are dependent, but are simply without the advantage of a contract or benefits. In essence, they are employees with lower stability and higher risk than those in the standard employment relationship[2] (Böheim and Mühlberger, 2009).

Situations of this type are extremely prevalent in some countries, and minimally present in others (see below). However, there is general agreement that it is an increasingly common employment situation around the world (Williams and I. A. Horodnic, 2019). Dependent self-employment is one of several types of non-standard work arrangements that are of increasing interest to scholars. Others include temporary employment, on-call and zero-hour work, and multi-party employment (e.g., Kalleberg, Reskin, and Hudson, 2000; ILO, 2016; Pedulla, 2016; Addabbo and Solinas, 2011; Koch and Fritz, 2013).

Unfortunately, the ILO does not at present provide data in accordance with ICSE-18-A. Instead, countries' labor force surveys categorizes workers as one of the following statuses in employment: employers, employees, own-account workers, and contributing family members[3]. Data is also collected on aspects of people's jobs such as work hours, underemployment, occupation,

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[1] These terms are often not well-defined as may be either be overlapping, identical, or disjoint (Williams and I. A. Horodnic, 2019).

[2] The International Labor Organization has defined the standard employment relationship to mean one that is "continuous, full time, and part of a subordinate and bilateral (or direct) employment relationship" (ILO, 2016).

[3] The following information is from the ILO (2016) report on non-standard employment. Some labor force surveys include additional categories or sub-categories. For example, the Bangladesh Labor Force Survey also treats "day laborer" as its own employment category and the Italian Labor Force Survey identifies *collaboratori* (a class of "para-subordinate" temporary freelance worker). Slovakia explicitly identifies "false self-employed". However, these additional categories are highly country-specific and in most cases do not provide enough information to separate the dependent self-employed from the independent.

sector, and formality. However, none of these characteristics directly addresses independence or flexibility.

At first glance, it might seem that own-account workers plus employers constitute the set of independent workers. However, this is not the case because the own-account worker category includes both dependent and independent workers. It is for this reason that the ILO has found it necessary to establish a new standard. Similarly, the OECD indicates that there is a class of "independent contractors" who work autonomously but "whose conditions of work are nonetheless similar to those of employees, in the sense that they work mainly or exclusively for a specific client-firm […] with limited autonomy and often closely integrated into its organizational structure" (OECD, 2014, pg. 146 as cited in ILO, 2018). Eurofound distinguishes two types of self-employed people: those who are "really self-employed and running their own business" and those who "depend on a single employer for their income and thus have no real autonomy in running their 'business'" (Oostveen, Biletta, Parent-Thirion, and Vermeylen, 2013, pg. 1 as cited in ILO, 2018). As all three of these definitions make clear, many people who are classified as own-account workers are dependent.

Thus, the main difficulty with measuring the set of independent jobs lies in excluding the dependent self-employed from the set of all own-account workers. Surveys that directly measure dependent or independent self-employment are extremely rare (Williams and A. V. Horodnic, 2019), and there are none that I know of that offer data for more than a fraction of the 17 countries in the SGC-MHS. The 2010 European Working Conditions Survey (EWCS) is one survey. This survey provides data for 22 European countries, of which Bulgaria, Belgium, Cyprus, Germany, Great Britain, Hungary, and Spain are part of this study (Eurofound, 2010). Hevenstone (2010) additionally identifies individual studies for the UK, Italy, Greece, and Austria, and the Urban Livelihoods Study gives data on dependent self-employment prevalence in Dhaka, Bangladesh.

Thus, there is direct measurement of the prevalence of independent jobs for eight of the seventeen countries in this study, with data from the EWCS and the Urban Livelihoods Study. The standards defining independence in these surveys were described in Chapter 4. For the EWCS data, I used the same definition as Oostveen, Biletta, Parent-Thirion, and Vermeylen (2013). The Urban Livelihoods Survey data has a built-in definition, which I discuss in more detail here.

The Urban Livelihoods Survey defines works as dependent if they rely upon a larger enterprise for credit, tools, or premises. For example, many cloth makers who operate "independently" have a single larger supplier/buyer (often the same person, the mahajan/mohajan). The relationship between the nominally independent producer and the mohajan can take several forms. This system may be piece-rate, where they are paid per unit produced usually at a below-market rate in exchange for market access, or they may purchase on credit the materials necessary to their work in a system reminiscent of sharecropping (Raihan, 2010; Khasnabis and Nag, 2001 (India); Chowdhury, 1989). Similar relationships have been observed in a variety of other industries, such as fishing (Ahmed, Islam, and Shamsuddoha, 2007) and honey collecting (Sohela, 2013). Perhaps most importantly, dependent self-employment is also widespread in the rickshaw pulling sector, which may constitute as much as one third of male employment in Dhaka (Opel, 2010). Rickshaw pullers, while nominally independent are often in a form of debt-servitude to the money-lender/garage owner who decides if they get to keep working, or indeed if they will rent to them in the first place, a decision which is usually contingent upon being known by the mohajan or referred by someone known to him (Opel, 2010).

The Urban Livelihood Study gives the fraction of self-employed people who were independent in 1999. To make years comparable, I apply this to the fraction of own-account workers in Bangladesh in 2011 (the same year as I have data for all of the other countries) according to the Bangladesh labor force survey data as reported by the ILO (ILO, 2011a), adjusted as all the other datapoints were for the unemployment rate and labor force participation rate that same year.

In the cases of Cyprus and Bangladesh, the direct measurements of independent job prevalence from these surveys are in conflict with the indirect measure of business ownership, with one almost half the size of the other. I note that this is not the case with the six other countries for which I have direct measurements of independent job prevalence (Belgium, Bulgaria, Germany, Great Britain, Hungary, and Spain). For these six countries, the direct and indirect measures differ from each other by at most a few percentage points. This gives strength to the idea that the indirect measure of business ownership is generally a good substitute.

Why might that not be the case for Bangladesh and Cyprus? One reason is that both Cyprus and Bangladesh seem to have very high numbers of dependent self-employed people in contrast to other countries. According to the EWCS data, Cyprus has a higher fraction of dependent self-employed than any of the 26 other countries surveyed. This is despite having an average number of independent self-employed people. That Bangladesh has an extremely high fraction of workers of this type is illustrated by the discussion of mohajan relationships. Of course, it is impossible to say whether other countries are also misrepresented by the indirect measure of business ownership. If there were a direct measurement for the remaining nine countries, it would clearly be desirable to use that instead. However, given that these measurements do not exist at this time, I have privileged the direct measures for countries where it is clearly superior, and used the indirect measure in all other cases.

Clearly there is a tradeoff between keeping all data and having some inconsistency in measurement, and prioritizing consistency of measurement but at the cost of over 10% of the data. However, it is also the case that there is not a great deal of difference between the choices in terms of the result. Excluding Cyprus and Bangladesh decreases statistical power, but doesn't alter the main conclusions. For example, for the male group without controls, the coefficient for fraction of supportive jobs and country mean stigma scores without Cyprus, without Bangladesh, and without either are, respectively -0.63 (p-value: 0.017), -0.72 (p-value: 0.022), and -0.50 (p-value: 0.030). These

values can be compared to those for Chapter 4, Table 4.2, Model 1. For the male group with all controls and random effects, the coefficients are -0.62 (p-value: 0.015), -0.70 (p-value: 0.017), -0.46 (p-value: 0.027). These values can be compared to those for Chapter 4, Table 4.2, Model 4.

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