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LESS-INSTITUTIONALIZED SOCIAL STRUCTURES: A THEORETICAL,
METHODOLOGICAL, AND EMPIRICAL ANALYSIS OF HOW NETWORKS AND
CULTURE MATTER FOR EMERGENCE

by

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ABSTRACT OF THE DISSERTATION

Less-Institutionalized Social Structures: A Theoretical, Methodological, and Empirical
Analysis of How Networks and Culture Matter for Emergence

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Using a networks and culture lens, I investigate the micro-level processes underlying the production of order in social contexts or locations that are relationally-defined and meaningful, but lack cultural cues to action and interpretation or are in the early stages of acquiring such meaning. Drawing on neoinstitutionalist theory, I refer to such social structures as *less-institutionalized*. To explain order in the absence of situational cultural cues literature in social network analysis has traditionally attributed regularities to situational structural tendencies that preclude shared understandings and/or subjective engagement. Recent literature in the sociology of culture that revives overarching moral intuitions as a basis for action similarly rejects the explanatory value of situational cultural cues. Arguing that culture is neither irrelevant nor implicated in an overarching way in culturally less-institutionalized situations, I posit that order can be linked to

individuals' tacit and discursive use of cultural repertoires acquired over the life-course through involvements in *multiple* networks of interaction and domains of shared meanings or 'netdoms.' I analytically distinguish between three categories of less-institutionalized situations of the basis of the degree of uncertainty in interpretation and action they impose upon their occupants: high, intermediate, and absence/low. I demonstrate my argument using three examples of less-institutionalized situations/positions from distinct sociological fields: (1) rapid labor-force feminization in South Asia (high-uncertainty); (2) an emergent area of knowledge production (intermediate-uncertainty); and (3) falling average sibship-size implicated in worldwide fertility decline (low/absent uncertainty). Elaborating upon three cross-netdom mechanisms - analogizing, contrasting, and spillovers – and using a mixture of interpretive techniques, multilevel statistical models, and exponential random graph models, I show that occupants use cultural repertoires discursively in high-uncertainty less-institutionalized positions, tacitly in low-uncertainty situations, and in a combination of tacit and deliberative ways under conditions of intermediate uncertainty. I also develop a mathematical model to show how less-institutionalized practices/interpretations can come to be institutionalized over time through management of uncertainty within homophilous networks. Lastly, positing a duality between the cultural repertoires of individuals and those of social locations, I conclude with a discussion on how less-institutionalized positions offer a unique window into investigating processes of emergence and social change.

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Chapter 1: Introduction

Less-Institutionalized Positions

This dissertation is broadly concerned with structural and cultural emergence as viewed through a social networks and culture lens. More specifically, I am interested in exploring the micro-level *processes* underlying the production of order in social contexts or positions that either lack cultural meaningfulness or are in the early stages of acquiring such meaning. By culturally meaningful, I mean the social situation or position has associated with it habitually-perpetuated, typified rule-systems governing behavior that are socially agreed upon and have an existence independent of the individuals using them (Berger and Luckmann 1967[1966]; Jepperson 1991). Conversely, a lack of cultural meaningfulness implies that the position or situation does not have associated *specifically* with it socially legitimated, taken-for-granted, and shared understandings orienting action and interpretation. Drawing on neoinstitutionalist literature (DiMaggio and Powell 1991, Zucker 1977; Meyer and Rowan 1977), I term these types of culturally non-meaningful or emergent situations as *less-institutionalized*.

Since it is generally well-understood that cultural cues play an important part in shaping action and thought (e.g. Swidler 1986, Zerubavel 1997), my primary question of interest in this dissertation can be stated as follows: in the absence of well-defined cultural cues to interpretation and practices, what accounts for regularities in behavior in less-institutionalized situations and what are its implications for the emergence of new social orders? As one can imagine many different types of situations that are lacking in

such cultural ordering,¹ I limit the scope of my analysis by focusing on two specific types of less-institutionalized situations. One, I apply the concept to emergent social contexts, such as organizations or fields, where rules of interpretation and action are in flux rather than crystallized. Two, I focus on relationally-defined and relationally meaningful social locations that do not, however, amount to culturally meaningful social categories. Since both categories of situations can be viewed from the point of view of the *individuals* who are either embedded in emergent contexts or occupants of culturally non-meaningful social locations, I use the umbrella term less-institutionalized *positions*.

I argue that less-institutionalized positions take different forms depending on the level of *uncertainty* they generate for their occupants. While uncertainty is an inherent feature of social life (White 2008a), absence of cultural rules in less-institutionalized positions creates a basis for a heightened sense of uncertainty. I take uncertainty to mean that actors are unclear about what course of action to follow or how to interpret a given situation and sense-making requires effort. While levels of uncertainty-generation in less-institutionalized positions can vary continuously from low to high, I analytically differentiate between three intensities of uncertainty as depicted in Figure 1-1.

[Figure 1-1 (about here)]

A number of significantly influential theories in diverse subfields of sociology offer explanations for action and interpretation along the axis of cultural uncertainty in Figure 1-1. Traditionally, literature in social networks has largely been focused on locating relational regularities either by bracketing cultural content and subjective

¹ Tilly (1998:54), for example, argues that some situations lacking scripts and shared knowledge, such as pedestrians avoiding one another on a sidewalk can entail only “shallow improvisation.”

understandings (e.g. White, Boorman, and Breiger 1974) or, more radically, by assuming them to be largely irrelevant to the production of order (cf. Emirbayer and Goodwin 1994).² Consequently, tools and insights developed within this field are ostensibly suitable to the analysis of situations lacking cultural ordering. These explanations tend to locate the source of order in less-institutionalized types of positions to extra-cultural, structural tendencies that impel action and interpretation in predictable ways (e.g. Burt 1982, Leifer 1988, Martin 2009). At the other extreme, Swidler (1986, 2001) argues that highly articulated ideologies provide unified answers to aid in the development of new strategies of action during highly uncertain ‘unsettled’ times. Whereas network analytic explanations focus on situational structural factors, Swidler emphasizes overarching cultural explanations. Revitalizing the traditional values-and-ends model of culture most notably associated with Weber and Parsons, Vaisey (2009) argues that deeply internalized moral intuitions motivate action by doing what ‘feels right’ in situations marked by middling levels of uncertainty. Such overarching values permeate all aspects of life and should therefore motivate behavior in situations where uncertainty is low enough to be resolved ‘commonsensically’ on the basis of one’s habitus (Bourdieu 1992) or existing cognitive schemas (Strauss and Quinn 1992).

Drawing on recent literature lying at the intersection of social network analysis and culture, particularly the work of Harrison White (2008a) in *Identity and Control* and Ann Swidler’s (1986) toolkit model of culture, I argue that culture is neither irrelevant to the production of order in less-institutionalized positions, nor implicated in an

² While this is a more faithful characterization of traditional work in social network analysis, the widespread transposition of tools developed in this field to other disciplines has reproduced this tendency to ignore cultural context.

overarching, unified way. Acknowledging the role of structural implications in less-institutionalized positions, my general claim is that despite the ‘undeveloped’ nature or absence of cultural meaningfulness, as is the focus of my study, culture is implicated ‘indirectly’ via individuals’ involvements in *multiple* networks of relations and domains of shared meanings and norms. Moreover, I develop arguments to show that the cultural micro-mechanisms producing order in less-institutionalized positions vary on the basis of the level of uncertainty the position imposes upon its occupants. I illustrate this model using three examples from distinct fields: knowledge production, fertility decline, and neoliberal policy reform in South Asia. These examples span the uncertainty axis in Figure 1-1. My data, goals, and findings from these examples are briefly summarized in the following section.

This project makes contributions to multiple subfields in sociology. My theoretical arguments and overall findings contribute to recent developments in the field of social network analysis that challenge the traditional emphasis on highly structural explanations positing instead a dual relationship between networks and culture (e.g. Fuhse 2009, McLean 2007, Mische 2011, Pachucki and Breiger 2010, White 2008a). The concept of less-institutionalized positions pushes the field further by theorizing uncertainty in relationally defined situations as well as individual responses to such uncertainty through discursive and tacit techniques as cultural phenomena. By focusing on culturally emergent or ‘undeveloped’ situations, this project also contributes to literatures investigating processes underlying the emergence of cultural institutionalization and social change.

In investigating the tacit and discursive micro-level social processes that come together to produce order in less-institutionalized positions, my analysis also contributes to a burgeoning social networks literature exploring the links between micro-level behavior and macro-level outcomes (e.g., Bearman, Moody, and Stovel 2004, Erikson and Bearman 2006, Martin 2009, Moody 2004, Powell et al. 2005, Stark and Vedres 2006). A major development in this field is a rigorous demonstration of how social processes operative at the micro-level concatenate in complex ways to guide the structuring of the network at the macro-level. The development of new techniques in social network analysis, particularly Exponential Random Graph Models (ERGM), is useful for exploring links between micro-level processes and macro-level outcomes. I use this set of techniques in Chapter 4 to illustrate how different micro-level social processes concatenate to structure an emergent research field.

Since my examples span diverse subfields in sociology, this dissertation also contributes to those areas of research. Specifically, I show that while the emergence of novel occupational opportunities can create uncertainties in interpretation, the interplay of existing cultural schemas and structural logics of factory employment can play an important role in generating novel identities and action profiles for women employed in garment manufacturing in Export Processing Zones in South Asia. My research on declining fertility and composition of social networks suggests that continuing declines in fertility could bring about both reinforcement and rearticulation of the sociocultural framing of close personal relationships. Moreover, consistent with recent research, I also show that personal networks are influenced more by individual-level than country-level factors. Lastly, my work on knowledge networks indicates that the social forces

structuring a literature in its early years are somewhat different from those affecting an established field. Citing a small stock of influential authors is more crucial for authors hoping to publish in an emergent field. Simultaneously, scholars publishing in an emergent area are likely to be both innovative and influenced by eclectic sources.

Overview of the Dissertation

In the first chapter, I provide a general overview of the puzzle I am interested in exploring. I conceptualize and develop less-institutionalized positions as a form of social organization by distinguishing them from highly-institutionalized positions such as roles as well as positions in organizational and other culturally crystallized contexts. I analytically distinguish between three different types of less-institutionalized positions depending on the degree of uncertainty in interpretation and action imposed by the structural contingencies of the position upon its occupants. I argue that even though less-institutionalized positions are not culturally meaningful categories, culture is nevertheless implicated in the production of order in such locations. Rather than through direct situational cues, however, it is implicated indirectly via ‘switches’ and ‘spillovers’ across individuals’ repertoires (Swidler 1986, 2001) acquired through involvements in multiple other networks of relations and domains of shared meanings or ‘netdoms’ (White 2008a). Drawing on Schutz (1970, 1973), White (2008a), Giddens (1986[1984]) and Padgett and Powell (2012), I elaborate upon three mechanisms – analogizing, contrasting, and spillovers - to show that, cultural transposition across netdoms can occur both at the discursive and practical levels of consciousness. The first two mechanisms are likely to be found in less-institutionalized positions characterized by uncertainty and draw on the discursive/deliberative mode of cognition while the third mechanism based in the

practical/automatic mode is likely to apply in cases when occupants do not experience uncertainty. Lastly, I argue that, in much the same way that individuals have cultural repertoires, it may be useful to think of social structural locations as having a toolkit or repertoire of cognition and action associated with them. Whereas roles and other highly-institutionalized positions have well-formed repertoires (for example, parenthood entails emotional and behavioral regularities), toolkits of less-institutionalized positions are in flux or do not exist. On this basis, I posit a duality between the cultural repertoires of individuals and those of social locations – individuals acquire diverse toolkits by being members of multiple collectivities and positional toolkits come to develop and/or are reinforced and fine-tuned through the diverse repertoires that members bring with them. I conclude with a discussion on how such a notion of duality implies that less-institutionalized positions offer a unique window into investigating processes of emergence and social change.

I use three empirical examples corresponding to high, low, and intermediate levels of uncertainty respectively, to explore this theoretical framework. In the first example (embedded within Chapter 2), I argue that the culturally and historically unprecedented large-scale employment of women in export-oriented garment manufacturing in South Asia, occurring at a fairly rapid pace (Kabeer 2004), generated a type of less-institutionalized position that is culturally emergent. Lacking cultural cues to action and interpretation, women in this location experienced a high degree of ontological uncertainty. Drawing on the phenomenology of Schutz and White, I argue that, in such situations, actors resolve uncertainties discursively by drawing on other crystallized roles, such as gender, kinship, and domestic labor, through imaginative processes of analogies

and contrasts. I briefly illustrate these processes using quotes from literature on the feminization of the labor force in South Asia. These quotes provide evidence of both cultural recursion as well as innovative modification of existing practices and interpretive schemas.

In the second example (Chapter 3), I present sibship-size – the number of siblings one has – as an example of a relatively durable less-institutionalized position. While siblinghood is a meaningful category (it evidently involves a variety of behavioral expectations), sibship-size (e.g. two versus three) is generally not culturally laden with meaning. Nevertheless, a fundamental structural effect of having fewer siblings is that individuals have a smaller pool of available close-kin alters with whom to construct support networks. Thus, while sibship-size is a less-institutionalized position (in that there are structural tendencies associated with it but not cultural ones), it typically does not burden actors with interpretive uncertainty as in the previous case of women garment workers. Using multilevel regression on data from twenty-five countries, I find significant relational regularities associated with sibship-size. Compared to those with three or more siblings, adults with 0-2 siblings (as separate categories) are more likely to expect support from kin, close friends, and neighbors. However, adjustment of support networks towards such ties occurs in culturally expected ways. Those with fewer siblings are generally only more likely to turn to ties for the types of support typically associated with those relations. I argue that, in this type of less-institutionalized position that does not generate uncertainty, actors resolve the position's structural contingencies 'unconsciously' on the basis of tacit rules that they acquire from their multiple other roles.

For my third example (Chapter 4), I code citation data from an *emergent* research field distinguishing it from more established areas of research. I use this study to illustrate how actors sharing a research context cope with intermediate levels of uncertainty in a less-institutionalized context. Fuchs (1992), for example, argues that in the early stages of a research field's development, problems and concepts are not clearly defined. Consequently, routinization is low and uncertainty-levels are high. Yet, uncertainty associated with researching an emerging area when one has the general transferrable skills as a researcher and a scholar is decidedly less intense than uncertainty associated with moving to a new city to start working in a novel industry in a culturally and historically unprecedented way. At the same time, the situation poses greater ambiguity than the number of siblings one has. Consistent with these differences in levels of uncertainty, I find evidence of a mixture of discursive and tacit responses in this case. Using Exponential Random Graph Models (ERGM), I find that researchers respond somewhat tacitly by citing a small stock of exemplars leading to the creation of a densely interconnecting core. At the same time, similar to the garment workers' case, ERGM also captures tendencies towards discursive deliberation evident from researchers' invocation of diverse traditions and areas of research. Structurally, this leads to diffusely connected network of citations. The use of novel ERGM techniques satisfies a secondary goal in this chapter - to showcase the use of formal network analytic techniques to investigate the social and relational forces structuring a less-institutionalized field.

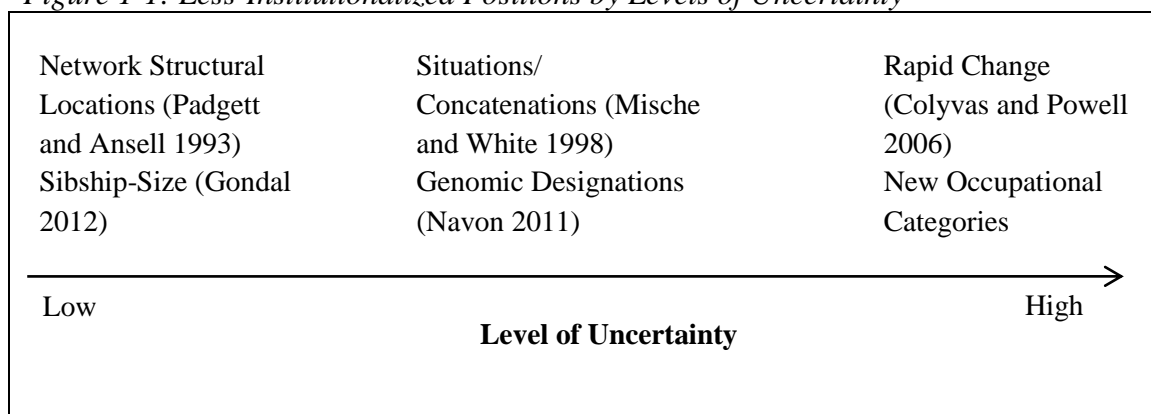
The concept of less-institutionalized positions opens up several avenues for future research. One such intriguing question pertains to the emergence of cultural institutionalization: how do practices and interpretations generated within a less-

institutionalized situation acquire cultural institutionalization? It is important to keep in mind that cultural institutionalization is not necessarily inevitable.³ Moreover, if institutionalization does occur, it can do so in a number of different ways (see, for example, Colyvas and Jonsson 2011). In the penultimate chapter of this dissertation, I theorize and analyze one specific relational mechanism: cultural institutionalization of practices and/or interpretations generated in less-institutionalized situations is possible if the location generates some uncertainty for its occupants and their initial adoption happens to be aligned with another highly-institutionalized social location or attribute such as race, gender, or nationality. Specifically, I develop mathematical and simulation models that show how initially less-institutionalized practices and interpretive schemas may diffuse at different rates across social networks that are ‘disjointed’ on the basis of some highly-institutionalized characteristic. Diffusion is differential if the spread of behavior across networks occurs at significantly different speeds such that contagion occurs much faster in some homophilous groups or if contagion occurs only in some groups and not others (DiMaggio and Garip 2011). Once a belief/practice becomes widespread within some groups and not others, it has the potential to acquire cultural meaning from existing salient group differences. Thus, layering over existing ‘islands of meaning’ (Zerubavel 1991) can hasten institutionalization of behaviors generated within less-institutionalized social situations. The analysis suggests that some initially less-institutionalized beliefs/practices can come to be institutionalized if uncertainty negotiation occurs within relatively homophilous networks. In the concluding chapter, I relate this mechanism to the concept of ‘publics’ (Mische and White 1998) which have

³ Unlike EPZ employment for women, sibship-size, for example, may never come to acquire cultural institutionalization.

been argued to be spaces that facilitate the convergence of meaning (Godart and White 2010).

Figure 1-1: Less-Institutionalized Positions by Levels of Uncertainty



Chapter 2: Less-Institutionalized Social Structures

Abstract: I conceptualize a general category of relationally-defined social locations with ‘undeveloped’ or emergent cultural aspects to which we can nevertheless attribute relational order. Drawing on neoinstitutionalist theory, I call such locations *less-institutionalized positions*. Lacking cultural meaningfulness, these positions stand in contrast to roles that entail both relational and cultural order. Less-institutionalized positions take different forms depending on the degree of uncertainty in interpretation and action imposed by the structural contingencies of the position on its occupants. Some positions, such as newly emergent occupations, pose high uncertainties for their occupants; others, such as network structural locations, pose limited or no uncertainties. Rather than structural explanations, as has been the tradition in social networks literature, I emphasize the role culture plays in producing order in less-institutionalized positions. I draw on Harrison White’s theory in *Identity and Control*, and Ann Swidler’s toolkit theory of culture to argue that, as these locations are not meaningful categories, culture is implicated ‘indirectly’ via switches and spillovers across individuals’ repertoires acquired through involvements in multiple networks of relations and domains of shared meanings or ‘netdoms.’ I elaborate upon three mechanisms – analogizing, contrasting, and spillovers - to show that, depending on the level of uncertainty, such cultural transposition across netdoms can occur both at the discursive and practical levels of consciousness. Positing a duality between the cultural repertoires of individuals and those of social locations, I conclude with a discussion on how less-institutionalized positions offer a unique window into investigating processes of emergence and social change.

Introduction

It is undisputed in sociological literature that cultural cues play a crucial role in orienting action and thought (e.g. Bourdieu 1992, DiMaggio and Powell 1991, Swidler 1986, Zerubavel 1997). Cultural cues, then, help people in coming up with appropriate strategies in response to ‘what is going on here.’ In this chapter, I focus on a different type of social situation and ask: what accounts for regularities in outcomes in social locations or situations that lack prefabricated cultural cues to thought and action *and* what are its implications for the emergence of new social orders? Specifically, I focus on the types of relationally-defined social locations with ‘undeveloped’ or emergent cultural aspects but to which we can nevertheless attribute relational order. As such locations do not amount to culturally meaningful categories, I refer to them as (culturally) *less-institutionalized*.

It is instructive to compare roles to less-institutionalized positions. This is because, in sociology, roles are generally conceptualized to lie at the nexus of cultural and relational structure. Roles are cultural because the behavioral expectations associated with them (e.g. Berger and Luckmann 1967[1966], Popitz 1972) and likewise the taken-for-granted or institutionalized logics of practice and representation associated with other role-like positions (Bourdieu 1992, DiMaggio and Powell 1991) act as powerful guides orienting cognition and action. At the same time, roles also involve relational regularities in the forms of patterns of relations with others (Nadel 1969[1957], Parsons 1991[1951]). While the cultural and relational aspects of roles may harmonize reasonable smoothly in many cases, this may not always be the case. DiMaggio (1992) termed this potentially problematic relationship ‘Nadel’s Paradox’ after Sigfried Nadel (1969) alluded to it in his

analysis of role systems. Yet, DiMaggio argued, a potential disjuncture between the relational and normative aspects of roles is also an opportunity to examine consequences of variations in the relationship between them. Less-institutionalized positions, defined as possessing relational but not cultural regularities, speak to this disjuncture between a position's normative and relational structuring principles.

My aims in this chapter are threefold. First, I conceptualize and develop less-institutionalized positions as a form of social organization. My starting position in this analysis is the social locations that individuals occupy. I leave aside for the moment why or how they come to occupy this location. I argue that less-institutionalized positions take different forms depending on the degree of uncertainty in interpretation and sense-making faced by occupants of the position. Second, I explore some ways by means of which actions and/or cognition of occupants of less-institutionalized positions come to be ordered. Given the relational definition of less-institutionalized positions, I approach this puzzle from a social networks perspective. Traditionally, arguments in this field have tended to privilege structural explanations for interpretation and action, bracketing subjective understandings and cultural content (cf. Emirbayer and Goodwin 1994). Accepting that structural explanations are of significant importance but unlikely to be 'self-sufficient' (DiMaggio 1992), I emphasize the role culture plays in producing order in less-institutionalized positions. As these locations are not meaningful categories, culture is implicated 'indirectly' via 'switches' and 'spillovers' across individuals' involvements in multiple networks of relations and domains of shared meanings and norms or 'netdoms' (White 2008a, Padgett and Powell 2012). Drawing on Giddens (1986[1984]), I elaborate upon different mechanisms that show how such multi-faceted

embeddedness implies that culture can matter both at the discursive and practical levels of consciousness depending upon the characteristics of less-institutionalized position. Third, I discuss some ways in which an examination of less-institutionalized positions can yield important insights into the improvisational as well as recursive aspects of cultural institutionalization, cultural emergence, and social change. I do this by positing a dualistic co-constitutive relationship between positional and individual repertoires of action and cognition.

In what follows, I begin by defining less-institutionalized positions as they relate to the concept of roles and institutions. Next, I summarize and contrast some existing theories of cognition and action that can explain behavior in less-institutionalized positions. Subsequently, I elaborate upon some mechanisms that show how culture acquired in other netdoms matters for organizing behavior in less-institutionalized positions. I conclude with a discussion of the usefulness of the concept of less-institutionalized positions for analyzing social change.

Degree of Institutionalization

Classically, sociological research has defined roles as lying at the intersection of cultural and social structure – shared understandings about systems of rights, duties, and responsibilities or the appropriate ‘ways of acting’ afforded by, sanctioned, and imposed upon individuals occupying particular positions as defined by sets of recurring relationships with other individuals (Linton 1936, Nadel 1969:11, Popitz 1972, Komarovskiy 1992). The concept of roles so defined has a close affinity to the concept of institutions in neoinstitutionalist literature. Mirroring the cultural dimension of roles,

institutions have been defined as habitually-perpetuated, typified rule-systems governing behavior (Berger and Luckmann 1967[1966]; Jepperson 1991). On the social structural front, such typified schemas are shared and available to all members of the *particular social group* to which the institution applies. Drawing on Berger and Luckmann, Tolbert and Zucker (1996) argue that institutionalization has three features: regularities in ways of doing things (habitualization), which are socially agreed upon (objectification), and have an existence independent of the individuals using them (exteriority). Jepperson similarly identifies three crucial aspects in defining institutions within such groups: (1) standardized interactional sequences with associated reciprocal behavioral expectations; (2) self-activating or self-organized as a matter of sheer repetition *not* through action intervention; and (3) taken-for-granted or part of the cultural and/or political discourse (p. 145-147). Mische (2007: 38-39) adds that groups develop recognizable styles of interaction – practices and relations – which in turn sustain the institution. Others (Zucker 1977; Meyer and Rowan 1977, DiMaggio and Powell 1983, Diehl and McFarland 2010) similarly highlight the interactional, publicly shared, normative, and exterior ‘facticity’ of institutions within organizational contexts.

Thus, the key characteristics of institutions are similar to those of roles. The distinguishing feature is that whereas roles are associated with specific social structural positions of equivalent actors, institutions pertain to groups of interacting actors sharing a common context such as organizations of different types. Yet roles can be subsumed under the general institutionalization concept. Berger and Luckmann (1967:64), for instance, contend that “the construction of role typologies is a necessary correlate of the institutionalization of conduct.” White (2008b), using the concept of ‘catnets’ similarly

argues that intense interactions over some period of time can give rise to identifiable categories of positions. In her presidential ASA address, Komarovsky (1973:649) distinguishes “institutionalized roles, linked to recognized social statuses” from other regularities in social interaction. One could thus say that roles as well as locations within groups where conduct is typified into standardized schemas as described above are *highly-institutionalized social structural positions* or ‘highly-institutionalized positions’ in short. Such locations have attached to them logics of *both* cultural rules of representation and practices as well as relational patterns.

If norms and self-reproducing, shared systems of rules contribute significantly to the production of order in highly-institutionalized positions, what imperatives guide behavior in the *absence* of legitimate, taken-for-granted scripts? Before we can attempt to answer this question, we need to conceptualize social locations that do not amount to highly-institutionalized positions - when we are not in culturally institutionalized positions, where are we? Highly-institutionalized positions have two key features – social structural location and normativity or shared rules. To limit the scope of my analysis, I focus on locations that are social in the sense that they are positions in the social structure. I take structural location to be defined on the basis of ties with other similar sets of individuals implying approximate structural equivalence⁴ or relations internal to

⁴ Strict structural equivalence implies that equivalent actors have *identical* ties to and from other all actors in the network. While occupants of less-institutionalized positions may be structurally equivalent, they could also be *isomorphically* equivalent. Actors are isomorphically equivalent if they are embedded in the exact same network graph rather than connected to the same actors. Two doctors with two distinct patients each are isomorphically equivalent. Weaker still, actors could be close to isomorphically equivalent rather than exactly. In an emergent occupation, say of garment manufacturing work in South Asia, for example, women working in medium and large-sized factories are involved in similarly configured employer-employee and intra-employee ties, although not strictly isomorphically equivalent ones. I use these terms rather than regular equivalence because, associated with behavioral expectations, it comes closest to the concept of roles (Wasserman and Faust 1994, chapter 12).

organizations entailing shared group context.⁵ The distinguishing feature then rests on the second characteristic of highly-institutionalized positions – shared behavioral expectations. Using the language of institutionalization, I define culturally *less-institutionalized social structural positions* or less-institutionalized positions as relationally-defined and relationally meaningful social locations that do not, however, amount to culturally meaningful social categories. Relational meaningfulness here implies two things (1) the position is defined social structurally in terms of sets of relations one has with others, and (2) that there are (or expected to be) relational patterns and/or regularities in action/interpretation of occupants that ostensibly follow from the relational logic of the position. Conversely, by culturally non-meaningful, I mean that the position does not have associated *specifically* with it socially legitimated, taken-for-granted, and shared understandings such as those that characterize roles.⁶ This distinction between roles and less-institutionalized positions is depicted in Figure 2-1.

[Figure 2-1 (about here)]

The horizontal axis in Figure 2-1 measures degree of relational patternedness while the vertical axis measures cultural typification. Roles and highly-institutionalized positions are depicted on the top right-hand corner of the graph as being characterized by high levels of both cultural and social structure. Less-institutionalized positions, in

⁵ Neoinstitutionalist theory focused on the emergence of institutionalization has primarily emphasized the latter type of organizational contexts. Yet, there is no reason why cultural ambiguity cannot apply to categories of persons who do not share a group context and are not ordinarily expected to interact with one another.

⁶ To be clear, I focus on locations where schemas for action and cognition are mostly missing or emergent. This distinguishes the concept from literature on how experts in an established field make sense of unfamiliar problems and other types of routinized uncertainty (e.g. Abbott 1988, Daipha 2012).

contrast, occur at the bottom-right corner as locations exhibiting high levels of relational but low levels of cultural patterning. This conceptualization of less-institutionalized positions suggests that cultural institutionalization should be a matter of degree rather than a dichotomous qualitative state (see also, Colyvas and Powell 2006, Tolbert and Zucker 1996). While the implication of this assertion is that we should be able to move continuously on the cultural axis between less-institutionalized positions towards roles in Figure 2-1, I analytically distinguish and develop three types of less-institutionalized positions.

It is reasonable to assume that occupation of less-institutionalized positions generates some contingencies in action and cognition attributable to the location's relational-structural logic. Interactional studies of dyads and triads, classically associated with Simmel (1950) and investigated by others (Becker and Useem 1942; Heider 1958), is an archetypal example of the structural contingencies posed by structural locations. In *Social Structures*, Martin (2009) provides a number of examples of such structural tendencies. In friendship ties, for instance, two individuals sharing many common friends tend to also develop a tie between them. Such triadic closure can be attributed to seeing one another frequently in shared contexts rather than to cultural rules. One basis for distinguishing between different types of less-institutionalized positions is how occupants treat such structural contingencies. In some types of less-institutionalized positions, occupants may be more prone to translating contingencies into a *heightened sense of uncertainty*. I take uncertainty to mean that actors are unclear about what course of action to follow or how to interpret a given situation, and sense-making requires effort. While such effortful sense-making may characterize roles, too, the absence of cultural rules

creates the basis for a heightened sense of ambiguity. The level of uncertainty associated with a less-institutionalized position can be treated as ranging from high to low as shown in Figure 1-1 (page 12).

High uncertainty is likely to characterize positions that involve a major, encompassing life change leading to what Swidler (1986, 2001) describes as ‘unsettled lives’ or periods of rapid social change (Mohr 1994). Such high levels of ambiguity linked to the unavailability or fuzziness of shared systems of rules can, for instance, be attributable to the emergence of novel forms of social interaction. The development of new organizational forms - the merger of academic and industrial science - in university settings (Colyvas 2007, Colyvas and Powell 2006), the creation of an unprecedented class of female manufacturing workers in traditionally patriarchal and low-income Asian countries (Hale 1996, Standing 1999), and the adoption of a non-normative and non-routine ‘master identity’ (Bearman and Stovel 2000) – these are all examples of this type of less-institutionalized position. Other structurally equivalent emergent positions attributable to technological innovations like sperm fathers and egg mothers (Newton-Small 2012), gene-based categorizations (e.g. Navon 2011), and the outsourcing of surrogacy by residents of wealthier nations to countries like India, are also appropriate examples of uncertainty generating less-institutionalized positions. Such emergent forms may exhibit patterned relations such as formal employment-based ties, configurations of inter-organizational ties, and sociobiological connections, yet lack socially legitimated ways of behaving.

Other types of less-institutionalized positions depicted on the left-hand side in Figure 1-1 while generating relational contingencies may not generate uncertainty for

their occupants. One reason this may occur is because such locations mesh well with other highly-institutionalized roles one occupies. Absence of uncertainty may also be attributed to actors not being actively aware or engaged with occupying the less-institutionalized position. As a consequence, relational contingencies generated by the less-institutionalized position can become ‘absorbed’ into the culturally legitimated action and cognition responses generated by one’s other highly-institutionalized positions. Analytical positions such as the number of siblings one has (as I demonstrate in Chapter 3), positions revealed in structural network analysis such as through blockmodeling (e.g. Padgett and Ansell 1993, Bearman 1993), and in conversation order (e.g. Gibson 2005) are examples of such structural and structuring locations. Literature on sibship-size, for example, shows that the number of siblings one has a significant and meaningful impact on the quality of one’s relationships and structure of social networks. Sibship-size is, therefore, a relationally meaningful category. Yet, it is not a culturally typified position in that it does not have shared behavioral rules associated with it.⁷ Thus, while sibship-size is a less-institutionalized position (in that there are structural tendencies associated with it but not cultural ones), it does not burden actors with uncertainty on a regular basis as might be the case with moving to a new city to start working in a novel industry in a culturally and historically unprecedented way.

In between these two extremes of uncertainty in Figure 1-1 are less-institutionalized positions that are likely to pose some uncertainty for their occupants but

⁷ One exception to the case of children is the single-child. Increasing incidence of single-children and accompanying research investigating its sociational consequences in the seventies and eighties (e.g. Claudy 1984, Falbo 1978) and terminology such as the ‘lonely only’ infused the position with meaning. In China, particularly, the single-child category suddenly rose to a highly connotative term in light of the single-child policy.

not to very high levels. Newly emergent research areas lacking an intellectual core that anchors the field can pose uncertainties for researchers (as I demonstrate in Chapter 4). Concatenated roles, such as brother-in law, are also a suitable example because they have a structural basis (see, for example, Breiger and Pattison 1986; Wasserman and Faust 1994) but not always a cultural one. While romantically intimate behavior is generally institutionalized, it is less stylized and predictable in the context of a professional setting creating what Mische and White (1998) call ‘situations.’ Likewise, whereas behavioral expectations associated with friendship within a given context are considerably codified, those with friends-of-friends are more ambiguous.

Theories of Interpretation and Action in More and Less-Institutionalized Positions

What role do culture and relational structure play in producing regularities in less- and highly-institutionalized positions? Diverging from the Weberian and Parsonian values-and-ends model of culture, a significantly influential body of literature in contemporary sociology has shifted the focus to situationally-cued repertoires of cognitions and action. This model suggests that people acquire culture within multiple collectivities such as communities (Fleck 1981, Zerubavel 1997), organizations (DiMaggio and Powell 1991), networks (Gould 1995, Mische 2007, White 2008b), and class positions (Swidler 1986). Rather than the traditional unified understanding of culture that manifests coherently and consistently across situations, this approach views culture as a complex set of rule-like structures (DiMaggio 1997). Diversity of cultural traditions and conflicting ideas and symbols within cultural traditions also means that people have access to a repertoire of cultural tools and they have options as to how and

which tools they use when. That is, as Swidler argues, all people ‘know more culture than they use’ and are skillful users of culture.

Given opportunity for choice, how then can we explain observed regularities? Order is situational: it can be attributed to cues embedded in the physical and social environment (DiMaggio 1997, White 2008a). Highly-institutionalized positions such as roles and memberships in well-defined communities or organizations system can be viewed as situational triggers producing order. When a person enters a well-defined role such as that of a parent, for example, the norms and/or shared systems of rules consistent with parenthood order his/her behavior in ways suitable to that role and not the myriad other ways that are theoretically possible. That is, people use strategies of thought and action that are appropriate to the situation they find themselves in and for which they have competencies (Swidler 1986, McLean 2007). Such positions, therefore, play a dual role – they are both structured and structuring locations (Bourdieu 1992, Mohr and White 2008). While this theory provides important insights into explaining behavior in situations where prefabricated cultural cues exist (i.e. highly-institutionalized positions), not all positions in the social structure are culturally structured enough to produce order in this way. Moreover, the theory leaves little room for the analysis or occurrence social change and emergence (Sewell 1992). One solution to this problem is to shift the focus of attention to less-institutionalized situations that are lacking in the culturally typified logics that trigger order in highly-institutionalized positions. How does sociological theory explain interpretation and action imperatives in such positions?

Rational choice models have offered one alternative. DiMaggio (1992) argues that in the absence of an explicit set of behavioral assumptions in social network literature

that explicitly rejected meaning systems or cultural categories as bases for action (e.g. White, Boorman, and Breiger 1976), instrumentally rational actor models filled the void (e.g. Burt 1982). He argues, however, that while rational choice models are appropriate under conditions of stability and high certainty where roles and interests are well institutionalized, they are least applicable in emergent situations where culturally embedded roles, statuses, and norms are absent. The high uncertainty characteristic of such situations implies that goal-defining utility functions may be too ambiguous to guide action in any meaningful way. A second related explanation is structural accounts for action – what Emirbayer and Goodwin (1994) describe as ‘structural determinism’ in social network research. In this case, in the absence of cultural heuristics, the local structure of relationships (possibly mixed with rational choice models) offer opportunities or impel action in predictable ways, often in ways that suppress subjective engagement. Leifer (1988) likewise argues in favor of what he calls ‘local action.’ This is a set of inherently ambiguous game theoretic action sequences aimed at acquiring a coveted role in a dyadic interactional setting. This highly structural model is applicable in settings where a sought-after role is pre-defined but it is unclear who will win that role and when individual and joint histories of the involved parties are not relevant to the exchange.

Non-normative yet ‘ecologically rational’ micromechanisms offer a fourth basis for explaining behavior in less-institutionalized positions. Distinguishing social structure (regularities in interaction) from cultural institutions (systems of shared understandings), Martin (2009: 7-9) argues “any useful definition of social structure has to allow for regularities in interaction that are not institutions, and that do not arise because interactants understand their normative responsibility to act in a certain way (...) It

[social structure] is a type of social organization that does not make reference to roles (...) and hence is analytically prior to institutions.” By focusing on this analytical distinction, Martin is able to differentiate the (structural) content of relationships from culturally normative understandings of relations. He defines content minimalistically (Lizardo 2010) as those *subjectively understood* aspects of the relationship that are “most pregnant with structural implications” (p. 11). Friendship as a relation, for example, can be framed as balanced and positive. This pared down definition of content nevertheless implies reciprocity (from balance) and triadic closure (from concatenation of positive ties) as well as cliques and clustering at a more macro level. Rather than deriving these structures from objective and exterior norms of friendship, they can be derived from the constraints and enablings posed by structural tendencies that individuals can process and consciously engage with, resulting in “ecologically rational” action.

An alternative to emphasizing the structural features of less-institutionalized settings, overarching rules or intuitions that cut across contexts offer a fifth explanation in the absence of position-specific rules. Recently, Vaisey (2009) has made an effort to revitalize the values model of culture. He argues that deeply internalized moral intuitions motivate action by doing what ‘feels right.’ In Bourdieun spirit, such overarching values permeate all aspects of life and should logically motivate behavior in the absence of other more locally-situated rules and norms. Although most notably associated with the toolkit model that Vaisey challenges, Swidler (1986, 2001) similarly argues that new strategies of action develop in a similar overarching way in, what she calls, unsettled periods. Highly articulated ideologies provide “*unified* answers to problems of social action” during periods of major change (2001: 96, 99 emphasis added).

The common theme connecting the first four explanations is that they locate the source of order in less-institutionalized positions to extra-cultural, structural factors. While Vaisey's and Swidler's explanations shift the focus back to culture, they emphasize unified solutions across situations rather than situationally-cued repertoires. I offer an alternative model to explain how regularities are produced in less-institutionalized positions. Acknowledging the role of structural implications in less-institutionalized positions, I argue that culture also matters, but indirectly, via *multiple other* institutionalized roles individuals occupy or are exposed to. This can occur in two ways depending upon the characteristics of the position. When the contingencies generated by less-institutionalized positions pose considerable uncertainty for its occupants, individuals are faced with challenging situations that do not fit with existing schemata. In this case, actors often deliberate over what to make of the situation and how to proceed. In other types of less-institutionalized positions that structure action and cognition but are not interpreted by actors as posing uncertainties, occupants can be expected to behave relatively unproblematically on the basis of cues attached to their other institutionalized roles and positions. These two types of processes fit Giddens's (1986) discursive and practical forms of consciousness. According to him, discursive consciousness "connotes those forms of recall which the actor is able to express verbally," and practical consciousness "involves recall to which the agent has access in the *durée* of action without being able to express what he or she thereby 'knows'" (p. 49). I draw on this dichotomy to suggest three mechanisms to link cognition and action in less-institutionalized positions with meanings associated with other highly-institutionalized positions – *analogizing, contrasting, and spillovers*. The first two

mechanisms are likely to be found in less-institutionalized positions characterized by uncertainty and draw on the discursive/deliberative mode of cognition while the third mechanism based in the practical/automatic mode is likely to apply in cases when occupants do not experience uncertainty.

The Role of Culture in Less-Institutionalized Positions

Switches across Netdoms

In the absence of cultural cues to action in less-institutionalized positions, one possibility is that individuals call upon a host of other information from diverse contexts to construct a ‘complex of meaning’ (Weber 1978). Simmel (1955) conceptualized this complexity in terms of the multiple social circles individuals occupy in their lifetimes. Harrison White and his collaborators draw upon this line of theorizing to argue that meaning is integrally related to actors’ navigation of ‘netdoms.’ Netdoms - a merger of networks of relations (net) and domains of topics (dom) characteristic of the network - are sets of social relations characterized by shared meanings that arise by virtue of sustained interaction over some period of time (White 1995, 2008a). This domain of meanings is the set of stories, scripts, “reflexive accountings” (White 1995: 1042), or the common parlance that are accepted in the netdom. Such meaning, White argues, arises as actors (more properly, identities⁸) *switch* between multiple netdoms (White 1995 and 2008a, White and Godart 2007, Godart and White 2010). Switching or shifting between congealed sets of meanings and interactions offers perspective aiding in the reproduction

⁸ White argues that all interactional situations entail uncertainties. Identities of social actors are triggered from such uncertainties and provide them with footings or orientations to action. Identities here do not connote notions of selfhood, but are ‘sources of action.’ Actors are composites of their identities. Identities operate in netdoms.

of existing meaning or in the development of new meaning. Meaning is inherently iterative because while netdoms provide access to modal meanings that have developed over long periods of time, individuals are also constantly fine-tuning that meaning as they navigate through various netdoms. Somers (1994) likewise argues that the multiple cross-cutting storylines and overlapping networks of relations in which individuals locate themselves are crucial to understanding how they interpret and make sense of their situations. Recent research in social networks suggests that such crystallized forms of meaning including perceptions and content of relationships (Bearman and Parigi 2004, Fuhse 2009, Yeung 2005), identities (McFarland and Pals 2005, Gould 1995, Bearman 1993), stories (Somers 1994, White 2008a), strategies of status attainment (McLean 1998, 2007) and political intervention (Mische 2007), amongst others often emerge in interaction with networks of ties (see also Mische 2011 and Pachucki and Breiger 2010 for excellent reviews on the networks-culture intersection). Network involvements thus become a crucial source of meaning for social actors embedded in them.

The merger of relations and meanings in netdoms implies that positions in networks provide access to certain shared and exterior meanings for individuals occupying those positions (Corona and Godart 2010). The set of accessible and socially legitimate meanings in netdoms helps to mitigate some of the uncertainty that is an inherent feature of social life (White 2008a). This conceptualization suggests that positions in netdoms can alternatively be viewed as highly-institutionalized social locations of both types mentioned above: in organizational settings where people have direct interaction leading to the development of meaning; and in structurally equivalent terms where meaning develops through repetition of similar types of interaction across

multiple sets of individuals in those social locations. Yet, netdoms do not account for positions where meaning is underdeveloped or emergent as in less-institutionalized positions. In a sense, such positions fulfill the ‘net’ portion of netdom but not the ‘dom’ aspect (Gondal and McLean 2013). Nevertheless, as individuals occupy many highly-institutionalized positions as they go about life, switches *from* such positions *into* less-institutionalized ones contribute to infusing meaning in the latter. This process can take two forms.

Analogizing in Switching: According to Schutz (1973: 80), individuals use their stock of personal as well as received schemas consisting of “institutionalized forms of social organization” that are ‘sedimentations of meaning’ to organize their experiences. Specifically, he argues we use this stock of meanings to interpret situations categorizing them as the ‘same,’ ‘similar,’ or ‘novel’ - something for which we have neither personal nor cultural knowledge (Schutz 1970). Drawing on Husserl’s concept of analogizing, Schutz argues that when individuals are faced with such an unroutinized situation, they construct meaning by interpreting it in terms of its features that bear some resemblance to features of taken-for-granted schemas. Conceptually, this argument is similar to Somers’s (1994) who argues that actors render uncertain events understandable by ‘emplotting’ them historically and relationally and, likewise, to Garfinkel’s (1967) ‘etc. clause.’ In his review piece, DiMaggio (1997) summarizes research asserting that actors compare experiences on the basis of shared innate features, structural similarities, emotional resonance, and polysemous expressions. Alexander (1988: 312-313) contends that this analogistic interpretive exercise consists first of typification, “turning all that is new into all that is old.” But subsequently we use this information to make sense of otherwise

intractable experiences by constructing new meaning, “something different, something invented, in each successive conceptualization of reality.”

Contrasts in Switching: Drawing on Luhmann’s (1995) notion of meaning as “processing according to differences” (see especially, White et al. 2007), Harrison White and his colleagues, emphasize *contrast* as the means by which switching between netdoms generates perception, meaning, and representations. In place of resonance, as in the previous case, they argue that meaning develops processually through the experience – not necessarily first-hand - of difference and *tension* which offers perspective aiding interpretation. Godart and White (2010), for example, explain how the meaning of war in fictional and non-fictional works is conveyed by depicting both the horrors of war alongside peaceful experiences of soldiers. Norms in industrial science and academia – initially divergent models of scientific production - likewise, co-emerge as practitioners switch back and forth between the two netdoms processing countervailing norms (Colyvas 2007). Crucially, however, meaning from contrast is not necessarily about binary oppositions. Rather, White, like Somers (1994) emphasizes the contrast generated from *acting across multiple networks*. Meaning-generation in academia and industry could also be fine-tuned as individuals traverse other netdoms, such as art and politics, for example.

The Case of Women Garment Workers

I briefly illustrate the processes of contrasting and analogizing in switching across netdoms using quotes from literature on the feminization of the labor force in South Asia. My intention is not to conduct a detailed analysis but to showcase how analogizing and

contrasting are utilized to construct meaning in a less-institutionalized situation. The advent of garment manufacturing industries in export processing zones (EPZ) in South Asia drew on women as a source of labor in traditionally patriarchal societies. This large-scale employment created an unprecedented class of women working in the manufacturing sector very rapidly (Kabeer 2004) generating considerable research interest (see Gondal 2011). In Bangladesh, for example, the number of garment manufacturing units increased twenty-fold between 1983 and 1992, the decade immediately following the adoption of new economic policies. More than three-quarters of employees in these organizations were women, most of whom had no previous experience in the organized industrial sector (Kibria 1995). By virtue of occupying an unprecedented social location of ‘garment factory worker’ in a traditionally patriarchal society, women working in these factories share in common certain structural features – a new income, newly generated occupational ties with fellow workers and with (generally) male supervisors, new housing relations, as well as immigrant-based relations with others such as landlords (Hale 1996, Kabeer 2004). At the same time, the emergent nature of the occupational category and social space implies the absence of congealed schemas that can be used by the workers, as well as their close ties for interpretation and action.

In a highly patriarchal context where it was rare for young unmarried women to leave parental homes, gender roles are frequently invoked in sense-making. The first three quotes are instances of analogizing showing how affected parties interpret novel experiences as similar to disparate aspects of normative gendered roles such as those pertaining to identity, marriage, and occupational ‘skill.’ The latter three, in contrast, depict how structural outcomes of this new social location are interpreted as affording

freedoms from 'default' gendered lives including dress, freedom of movement, self-sufficiency, and confidence. I have tried to highlight instances of analogizing and contrasting in boldface.

1. When Sharifa asked me about working in garments, I said, 'No, it's better that you stay at home. It's true that **now there are many girls working in garments, many good girls, from respectable families** (Quoted in Kibria 1998:10).
2. I cannot spend my money as I wish . . . my mother says, '**by saving money I will arrange your marriage into a good family.**' . . . **Dowry will be needed for my marriage**, not much, Tk. 10,000. (Quoted in Amin et al 1998:193).
3. **Men can't concentrate on a small job. Because... they are aggressive.** They want to do it and finish it fast... **But girls are not like that. They want to concentrate very carefully.... Even in the ironing.** If you give some shirts to girls to iron they will do it neatly, nicely.... The garment factory is not only speed oriented... **But if you have a food manufacturing trade, sometimes the boys may be better... like if you have to pound something.** (Quoted in Lynch 1999:71).
4. **In our country, those who do not work are regarded as good girls.** If a girl works, people ask many questions-where is the office, what is the office like, what is the work? But it is not worthwhile to give importance to these words. **One cannot sit idle just to be called a good girl. One has to do something and stand on one's own feet** (Quoted in Amin et al 1998:194).
5. **My married friends have to wear a sari, but I can wear a shalwar kameez. They cannot go out of the house on their own, and I go back and forth between the village and the city. They are not as confident or brave as I am. I have learnt a new trade and have a job, and they sit in the corner of the house and cook all day** (Quoted in Amin et al 1998:195-6).
6. **If you work in garments you can better yourself.** What's the use of sitting at home? **If I lived in the village I would be married by now, but I'm glad that my life is different. Because I'm self-sufficient I can go where I want and marry whom I want.** Even after I'm married, I will continue to live my life in my own way (Quoted in Kibria 1995:304).

These next set of quotes show how familial and other close relationships become transposed into the factory setting in both analogistic and contrasting ways. On the one hand, familial roles are used to interpret relations in the factory as fictive kin. On the

other, as opposed to the tight-knit quality of the village relationships where everyone knows everyone else, interactions in the city are marked by distrust leading to the formation of few meaningful relationships. At the same time, village ties are described as being prone to jealousy.

7. At the beginning I was very shy, I felt very uncomfortable in the new setting. I was suddenly together with a lot of people I did not know... **My senior operator who asked me to call her apa (older sister) was very nice and treated me like a daughter** (Quoted in Danecker, P 2000: 32).

8. It doesn't matter whether there are men or women in the **factory if you think if them as your brother or sister**. What is wrong with working together? Don't we work as brother and sister (Quoted in Kabeer 2002:97)?

9. This place appears safe to me. **It is like the home. We work in one of the rooms, the gates are closed when we come in and then, we go back home straight after work** (Quoted in Kabeer 2002:96).

10. **At home we are not being yelled at all the time. The work was not so hard either. We never hear a kind word here. I miss my family.** (Quoted in Attanapola 2006:221).

11. We cannot compare the people in the village and the EPZ area. **We do not [socially] interact with the people here.** Landlords just want our money and local men want to harass us. **They all are strangers** and have nothing to do with us because we are 'zone girls.' We have only our workers' community. **In the village, even though people know each other, they envy those who are capable of living better than they do.** (...) They are worse than the strangers in urban areas. So, how can you say that village life is better than here? (Quoted in Attanapola 2006:222).

The final set of three quotes I use show how contrasts with other socially accepted and culturally crystallized forms of women's employment generate meaning from perspective in a dynamic back and forth way. In interpreting the situation, these women almost adopt a rational-choice sense-making framework. On the positive side of garment work is superior treatment by employers, higher salary, working hours, compensation for overtime, and freedom. On the negative side is the provision of food and regular salary.

Comparisons with agricultural work yield health benefits, compensation, diverse interactions, and learning a new skill. Freedom and control over one's time feature significantly in the interpretations of women who have worked as domestic servants. Contrast with agricultural work, however, yields cosmopolitanism and skill-acquisition.

12. **So from a very young age I've been working in people's homes. (...) It's a lot of work, all day and night, and then there are a lot of hassles with people. You are constantly getting scolded, getting hit. So I left [about a year ago] (...) My salary now is 400 taka a month, which is more than what I got working as a domestic (100 taka), although they also gave me food. The problem with garments is that sometimes I get the salary and sometimes I don't. Still I think this is better than working in people's homes. If I can become an operator then my salary will be higher and my family will be able to live better. In garments you don't have to work all the time, sometimes you get Fridays off, and sometimes you can finish work at 5 p.m.** (Quoted in Kibria 1998:7).

13. **I left their employment because I couldn't go out without their permission. (...) Here in the factory, I work from 8 to 5, I get one hour lunch break, and I can do overtime. If you do overtime, they give you tiffin and money, and you are earning more. You get time off on Fridays. You have your freedom. I finish at the factory at 5 and go home and cook... It's my own house and my own bed. It's not like working in people's houses. In other people's houses, you have to obey all their orders and can't go to sleep before 12 o'clock at night and you have to get up in the morning before them ... There is no such thing as overtime pay** (Quoted in Kabeer 2002: 105).

14. **There are no jobs (chakri) in the village; you can make some money raising chickens or working for other people. Garments work is difficult, but it is easier on the body than cultivating crops, and you get paid every month. Garments work is also good because you go to the office every day, and you learn some new work** (Quoted in Kibria 1998: 12).

These are some selectively chosen quotes reflecting the experience of a few women. Nevertheless, they forcefully illustrate how, in the absence of a crystallized definition of the situation, recombinant analogizing and contrasts through dynamic switching between well-understood roles and a novel occupation shape strategies of interpretation and action in meaningful ways. While there are important themes such as

gender, kinship, and alternative employment options, no single one dominates in shaping understandings and practices in a coherent way. Moreover, the quotes are evidence of both cultural continuity in the form of reproduction of existing structures as well as creative disruption and modification of those structures. This is largely possible due to the blending together of structural conditions of the position with cultural elements from disparate domains of meaning.

In summary, individuals are likely to get drawn into deliberative use of what they already know well as occupants of less-institutionalized positions. Whether through analogizing or contrast, they cope by generating meaning by means of switching back and forth between the less-institutionalized situation lacking rules, and netdoms where, in contrast, meanings are congealed and legitimated. This process of switching serves a dual purpose. One, it gives form to an otherwise unfamiliar experience. Two, by doing so, it ‘renders the complexity’ (Luhmann 1995, chapter 2) of the experience, considerably limiting the various other interpretations that were theoretically possible (Colyvas and Maroulis 2012).

Netdom Spillovers

In the previous section, I elaborated upon the imaginative capacities of actors in processing information across their myriad roles in uncertainty-inducing less-institutionalized positions.⁹ Yet, as shown in Figure 1-1, not all less-institutionalized positions generate uncertainty. How is culture implicated in producing order in these

⁹ Analogizing and switching are, by no means, the only ways by which actors embedded in multiple networks attempt to discursively cope with uncertain situations. McLean (1998, 2007) and Mische (2003), for example, emphasize both more agentic as well as strategic means to make sense of and achieve desired ends in uncertain and changing situations.

types of less-institutionalized positions? Rather than assuming that the position's structural logic offers a self-sufficient explanation for behavior (DiMaggio 1992, Emirbayer and Goodwin 1994, McLean 2007), I argue that, similar in *form* to the uncertainty case, individuals manage the contingencies posed by the position on the basis of multiple other roles they occupy. *Distinguishing it from the previous case, however, such transposition occurs through automatic spillovers rather than through deliberative pathways.* The second type of consciousness Giddens describes is conceptually useful to specify such spillover effects. Practical consciousness, implicated in intensive and tacit awareness of rules, is always available at hand in such a way that 'knowledgeable' actors are capable of invoking it without necessarily being able to articulate (to themselves or others) that they are doing so. This concept has been influential for the connectionist model in cognitive anthropology (Strauss and Quinn 1992) which suggests that cultural schemas are networks of links between associations learned from past experience. In most situations, actors respond somewhat 'automatically' on the basis of this network of built up associations. Vaisey (2009) draws on these ideas to make a case for a dual process model of culture. These explanations suggest that human behavior is largely guided by a robust, practical, predominantly unconscious process.

The existence of a practical consciousness suggests that actors do not need to deliberate all the time. Rather deliberation is likely to occur in uncertain circumstances that do not fit into the existing network of learned connections. Consequently, in less-institutionalized positions that do not pose uncertainties, actors are likely to deal with structural contingencies on the basis of their practical consciousness. The outcomes of this process, however, depend on the *form* of practical consciousness. Bourdieu conceives

of the habitus as an encompassing or homologous structure structuring all aspects of social life. Vaisey (see also Vaisey and Lizardo 2010) likewise views practical consciousness as an ‘overarching’ worldview, internalized habits of moral judgment, and moral intuitions that permeate most aspects of life. This view suggests that knowledgeable actors will cope with structural contingencies posed by less-institutionalized positions on the basis of their class or moral social location, for example. Accordingly, we should observe regularities associated with less-institutionalized positions that do not induce uncertainty to be clustered around structures such as class or religiosity.

Challenging the overarching worldview argument, Sewell (1992) contends that social structure must be conceived of as inherently multiple and intersecting. The multiplicity of structures suggests that distinct structural and cultural logics at various levels may be operational simultaneously and intersectionality implies these multiple structures may overlap in their effects on representations and practices. This argument, consistent with White’s notion of netdoms, suggests that our practical consciousness is rooted in the tacit cultural rules we acquire from *multiple* domains, not a single dominant domain. It also emphasizes the situatedness of our practical consciousness - rather than a unifying theme, the tacit social rules we draw on depend on social and environmental triggers, including structural contingencies. This view suggests that actors will deal with contingencies of less-institutionalized positions that do not generate uncertainty by acting on the basis of their multiple other social locations where rules have congealed to the level of a practical consciousness. In this case, we should observe patterns in less-

institutionalized positions that are organized around a variety of netdoms, not necessarily an overarching habitus.

Multi-netdom involvements have been important in explaining order related to less-institutionalized positions in literature on social network analysis. Data from Renaissance Florence has been an especially fecund area of such research largely because of the availability of a rich dataset on multiple types of network connections. Padgett and Ansell (1993), for example, explain the Medici family's political control in Renaissance Florence on the basis of two sets of factors. On the one hand, blockmodeling reveals network structural locations that do not map onto culturally powerful cognitive classifications such as social and economic class. Particularly, the Medici lay at the center of a spoke network structure permitting them to wield considerable political power over other disconnected members of the elite. They thus occupied a culturally less-institutionalized but relationally significant social structural location. Yet, other sets of cultural typifications also contributed to Medici control. The authors trace the creation and maintenance of Medici power to social rules of interaction in marriage and trade that prohibited the entrenched elite from interacting with those anxious for inclusion. In the same Florentine context, Padgett and McLean (2006) argue that the 'social class institutionalization' of an emergent form of social organization in Renaissance Florence – the partnership system – drew on both the master-apprentice practice in domestic banking as well as the marital dowry logic of elite kinship. Gondal and McLean (2013) contend that personal lending, a comparatively culturally less-institutionalized domain of interaction, in Renaissance Florence's elite networks had multiple possible meanings – a familial obligation, an instrument of political patronage, and a tool for commercial

activity. These disparate meanings could be traced to actors' differential exposure to other more established networks of relations such as kinship, politics, commerce, and state administration. Such differentiated exposure meant that actors applied different sets of understanding to personal lending which manifested in variations in the micro- and macrostructure of personal lending. The authors, thus, draw attention to the interaction of structural tendencies and actors' transposition of rules from participation in a variety of netdoms.

In a different context, Gibson (2005) demonstrates that interaction order within meetings in organizational settings is strongly shaped by social rules pertaining to friendship and formal relations connecting those actors. In Chapter 3, I make a case for sibship-size, the number of siblings one has, to be an example of a less-institutionalized position. While siblinghood is a meaningful category (it evidently involves a variety of behavioral expectations), sibship-size (e.g. two versus three) is generally not culturally laden with meaning. I find that the structural effects of having few siblings – having a smaller set of familial ties to draw on for social support - are strongly moderated by role expectations; for example those with fewer siblings are significantly more likely to turn to parents for support but only for the types of support typically associated with parents such as financial and instrumental support but not emotional support. Thus individuals' 'unconscious' knowledge of the relational content appropriate to a *variety* of ties interacts with the structural effects of sibling-size. This literature suggests that practical consciousness responds to structural contingencies of less-institutionalized positions that do not generate uncertainty are rooted in multiple netdoms rather than an overarching one. More generally, Padgett and Powell (2012) argue that novelty can often be traced to

spillovers across multiple, intertwined social networks with other types of social relations structuring the *topology of the possible* ways in which new forms emerge.

Discussion and Conclusion

My aim in this chapter has been to answer the following question: what accounts for regularities in situations lacking in cultural cues? Since this is a question social network analysts frequently deal with, the answer has often been framed in structural terms. While structural tendencies are an important piece of the puzzle, I have argued that cultural rules are also part of the equation. Yet, because less-institutionalized positions are unlike roles in that they are not culturally structured, culture is implicated ‘indirectly’ through other network-domains in which actors are involved. In novel forms of social organization such as new occupational categories that generate considerable uncertainty, culture is more likely to matter at the discursive level of consciousness. Even though the position has not crystallized to the level of a distinctive cultural category, occupants (as well as non-occupants) are sensitive to its existence and hence sensemaking requires cognitive work in the form of analogizing and contrasts. In other types of less-institutionalized positions that do not generate uncertainty, occupants resolve contingencies on the basis of internalized rules and schemas that they acquire from their involvements in multiple other netdoms. This leads to network spillover or interaction effects, so that regularities associated with the less-institutionalized position are a mix of structural contingencies and cultural effects transposed from other domains of interaction. Figure 2-2 depicts this argument schematically. In terms of *form*, the role of culture is similar in both types of positions. If we were to depict it as a stylized network diagram, we would obtain a star structure with the less-institutionalized position in the center and

the practices and interpretations that get invoked in the periphery in both cases. Yet, the *content* of ties linking the hub to the periphery would vary depending on the type of position. In uncertainty-generating less-institutionalized positions, the ties would be discursive links, while in non-uncertainty positions, they would be automatic.

[Figure 2-2 (about here)]

In either situation, however, culture does not play a facilitative role in making some action and cognition sequences “more enactable than others” on account of the position’s cultural structuring (Swidler 2001:104-5). Under these circumstances, it may be useful to think of social structural locations as having a toolkit or repertoire of cognition and action associated with them. Given the improvisational emphasis in the toolkit theory of culture, we usually think of individuals as having access to a repertoire of cultural tools. Nevertheless, individual toolkits are built up on account of the various network-domains or collectivities that people occupy. Thus, fundamentally speaking, the notion of a ‘positional toolkit’ is not a radical departure from current literature. The structural location of ‘lover,’ ‘spouse,’ or ‘partner’ enables one to invoke multiple, disparate cultural tools from a diverse repertoire to make sense of and act in romantic situations (Swidler 2001). This is not to suggest that the toolkit of romantic partner is unique to the position, but rather that given the diversity of available tools, social locations then act as situational cues making some tools appropriate and others less so (DiMaggio 1997). The toolkit of a highly-institutionalized position can thus be thought of as ‘filled’ with multiple deployable options. Of course, some choices will be modal and other less frequently utilized which gives the sense of ‘naturalness.’

In less-institutionalized positions, by contrast, the positional toolkit does not exist or is simply too formless. Instead of viewing this as an analytical conundrum, less-institutionalized positions can be thought of a useful conceptual tool to capture the cultural and structural processes entailed in the generative rather than reproductive bases of social construction. Separation of individual and positional toolkits suggests a *duality* between them – individuals acquire diverse toolkits by being members of multiple collectivities (all people know more culture than they use) and positional toolkits come to develop and/or are reinforced and fine-tuned through the diverse repertoires that members bring with them.¹⁰ Mohr and White (2008) suggest a similar duality between styles and institutions: styles arise and are sustained within institutional settings that organize perceptions of actors. Yet, individuals also become carriers of styles, and it is through them that cultural institutions come to be. A duality between positional and individual repertoires likewise suggests that variation in occupants' exposure to sets of network-domains is likely to yield distinct outcomes for the emergence of toolkits in less-institutionalized positions.¹¹ In the feminized factory employment example above, different sets of women could bring with them and/or activate (through analogizing and contrasting) distinctive repertoires leading to the emergence of somewhat divergent positional toolkits. Differential exposure to distinctive netdoms can likewise lead to

¹⁰ My starting point is structural position. It is, of course, possible that certain types of individuals are more attracted to or more likely to find themselves in particular less-institutionalized positions. Consequently, the other roles they bring to bear on the less-institutionalized position can be expected to be patterned in particular ways leading to what has been called person-situation interactional effects (Carnahan and McFarland 2007, Vaisey 2008). But this does not negate the principles of the argument I making here.

¹¹ Of course, institutionalization of a positional toolkit is neither a guaranteed nor a straightforward or linear process. The eventual institutionalization of a positional toolkit minimally depends on occupant interaction dynamics, power distribution, and network structure. I have focused more on an origin perspective than on the process of diffusion and institutionalization (Colyvas and Maroulis 2012). Others (see, for example, Colyvas and Jonsson 2011, Colyvas and Powell 2006, Tolbert and Zucker 1996) have said much more about the process of institutionalization.

variable outcomes through spillover effects (Gondal and McLean 2013). It is an empirical matter to investigate what aspects of roles do and do not get invoked in this situation. A duality perspective, therefore, offers a unique window into analyzing the initial developmental stages of positional institutionalization. A combination of in-depth interview techniques alongside distillation of those data into a two-mode network comprising practices and interpretations from diverse netdoms, on one side, and individuals, on the other, provides an opportunity to explore this hypothesis in uncertainty-generating less-institutionalized positions. We may find, for example, that some interpretations are central to the network interlinking other less central ones, while some others tend to cluster together outside the core. Additional information on attributes of occupants may help contextualize such clusters of meaning-construction. Data on multiple-networks connecting individuals across diverse relations and joint memberships are likely to be useful to investigate less-institutionalized positions that do not generate a great deal of uncertainty. Such multi-network data may help to locate overlapping netdom participation yielding insights into spillovers. More generally, duality between positional and individual repertoires suggests that cultural tools we already possess play an important causal role in this process of social change both through deliberative netdom switches as well as spillovers.

Vaisey (2009) argues, however, that culture's motivational causal power is lost when we focus on deliberative situations because discursive consciousness is "incredibly good at offering reasons that may not at all be related to the real motives behind a person's behavior" (p. 1688). In such situations, rather than causing action, culture allows action to take place. The causal role of culture is more evident, he argues, when action is

motivated through the practical consciousness. According to this argument, culture is casually efficacious in the types of less-institutionalized positions where it is recalled automatically but not so in the types of positions that involve discursive sense-making. Yet, Vaisey's implicit assumption is that a single option stands out as feeling right. This is largely because he attributes this feeling of rightness to overarching moral intuitions that, he argues, guide action in uncertain situations. If we assume, instead, that an individual's habituated feelings of rightness can be traced to multiple, possibly conflicting sources, then we must examine all these elements to capture culture's causal role.

This, as I have argued, is especially the case with uncertainty-inducing less-institutionalized positions. In interviewing people about their experiences in such locations, we may well find some evidence of the type of justificatory accounting that Vaisey takes exception to. It is important to keep in mind, however, that, making sense of a situation in a less-institutionalized position is different from making sense of choices *post hoc* in highly-institutionalized settings. Swidler argues that the causal role of culture occurs in explicit and articulate ways when new ideologies come to the fore reorganizing action in a forceful way. Alternatively, as I have argued, the lack of a toolkit associated with the position induces recombination by means of analogizing and contrast 'pulling' multiple, possibly inconsistent and not necessarily explicitly ideological cultural schemas into the formation of new ones. This not so much a question of splitting hairs when interpreting interviews. It is unlikely that we will be able to find any unambiguous measure that tells us when responses are post-hoc justifications of decisions and when they entail causally efficacious sense-making in uncertainty. The difference lies, as

Archer (1982) argues, in timing. If it is reasonable to believe that the position is culturally emergent, then reading causality into culture's use in sense-making is not unreasonable.

The form and content of discursive consciousness used to construct relatedness don't simply allow action in emergent situations. Rather, because people don't know how to act 'naturally' in those locations, variations in the contrasts and analogies that get invoked will likely lead to the generation of variable logics of interpretation and action and thereby distinctive outcomes.

Figure 2-1: Roles versus Less-Institutionalized Positions

A two-dimensional depiction of roles as consisting of cultural and relational regularities while less-institutionalized positions consist of relational but not cultural regularities.

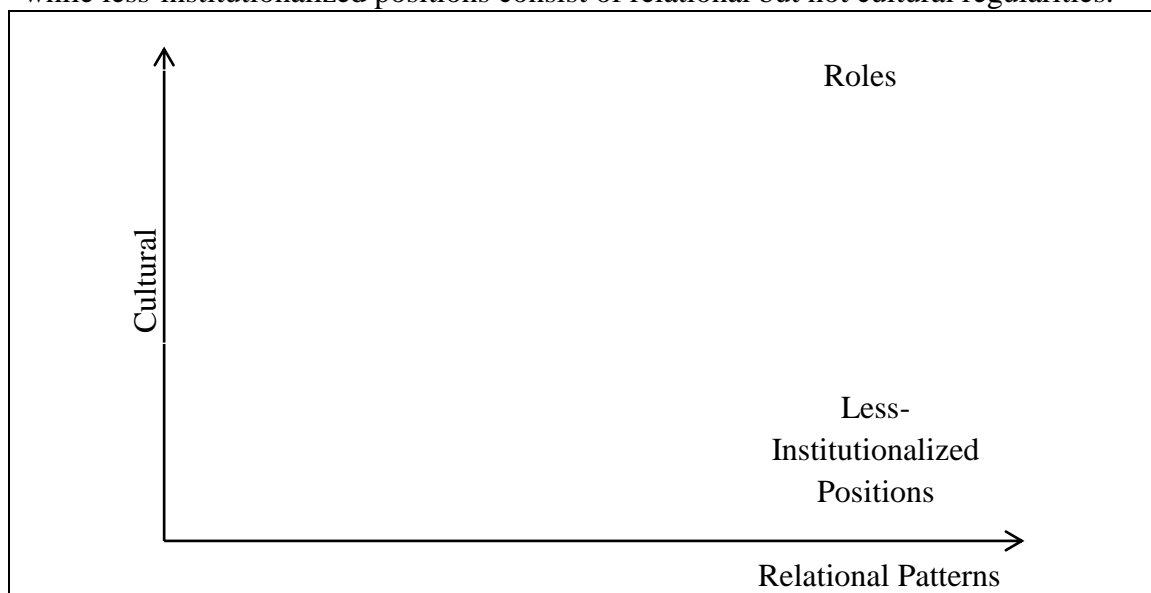
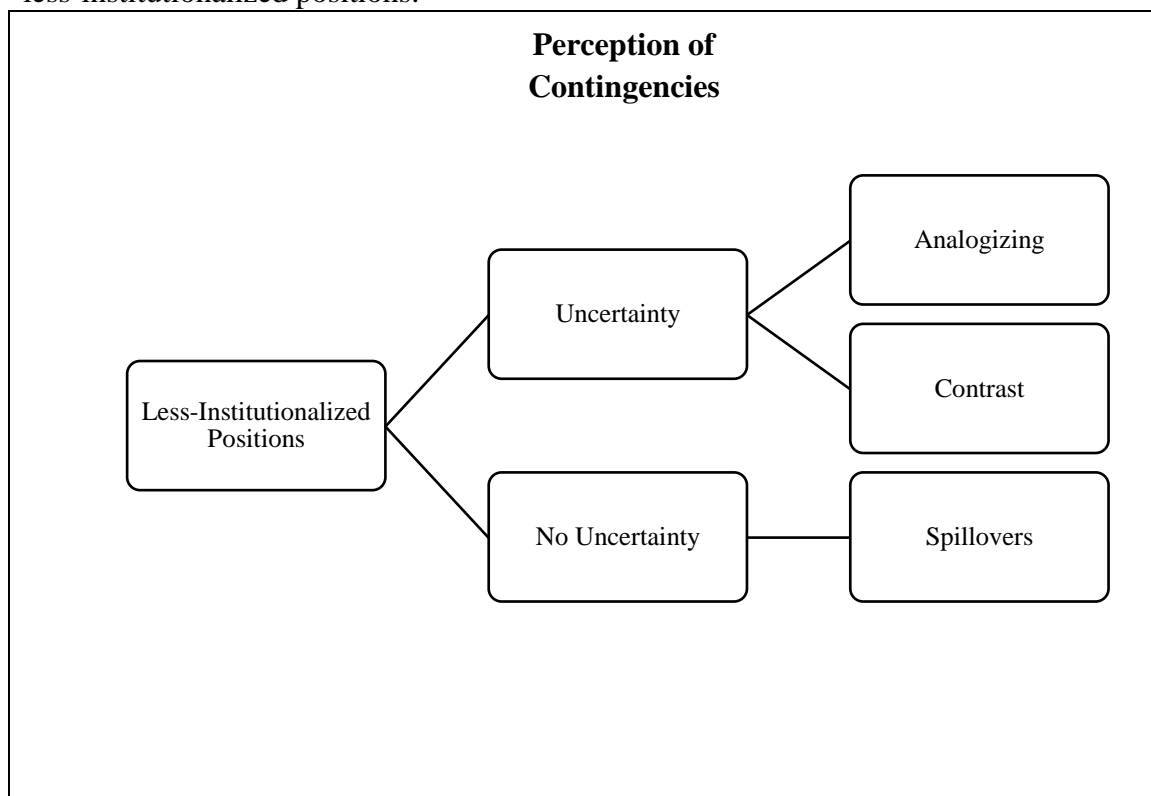


Figure 2-2: The Role of Culture in Less-Institutionalized Positions.

A schematic depiction of how culture matters in organizing interpretation and action in less-institutionalized positions.



Chapter 3: Who ‘fills in’ for Siblings and how? A Multilevel Analysis of Personal Network Composition and its Relationship to Sibship-Size

Abstract: Switching to the other side of the uncertainty axis (Figure 1-1), I examine my second example, the number of siblings one has, as an example of a less-institutionalized position. In the midst of widespread fertility decline, I examine the effects of sibling number on support network composition using multilevel regression on data from twenty-five countries. A fundamental structural effect of having fewer siblings is that individuals have a smaller pool of available close-kin alters with whom to construct support networks. Consequently, networks of people with fewer siblings should be composed of different sorts of relations. Yet, because sibling number does not generally have cultural meaning, it is a good example of a less-institutionalized position that does not typically generate uncertainty for its occupants. Results from my analysis confirm that compositional structural adjustment occurs in systematic ways. Compared to those with three or more siblings, adults with 0-2 siblings (as separate categories) are more likely to expect support from parents, extended-kin, and close friends but not more likely to do so from spouses/partners and children. Single-children are also more likely to include neighbors and have smaller-sized and/or impersonal networks. These findings contradict the primacy of familial ties in social support networks. At the same time, adjustment of support networks towards non-sibling ties occurs in culturally expected ways. Those with fewer siblings are generally only more likely to turn to ties for the types of support typically associated with those relations – parents for instrumental and financial support and friends for emotional support. This suggests that individuals’ tacit understanding of the meaning of various relationships spill over to moderate the

structural effects of sibling number on network composition. The results also suggest that continuing declines in fertility could bring about both a reinforcement and rearticulation of the sociocultural framing of close personal relationships. Moreover, consistent with recent research, the results show that personal networks are influenced more by individual-level than country-level factors.

Introduction

Fertility rates are declining nearly everywhere.¹² One implication of lower fertility is that people have fewer siblings, on average. Having fewer siblings reduces the size of one's available pool of close-kin ties. Moreover, to the extent that social interaction is meaningfully shaped by the number of involved parties (Simmel 1955), the number of siblings one has (hereon sibship-size) forms a durable context within which familial relationships develop over the life-course. If sibship-size affects both the pool of available close-kin ties as well the texture and quality of one's affiliations, then declining fertility can have significant implications for the structure and content of close personal relationships. At the same time, unlike sibling-hood, sibship-size is not a culturally meaningful category. Sibling-hood is a kinship role entailing behavioral expectations such as those of instrumental support and emotional support (for example, Campbell, Connidis, and Davies 1999; Eriksen and Gerstel 2002). The number of siblings one has (e.g. two versus three), on the other hand, is not culturally laden with meaning in the

¹²The Total fertility rate (TFR) is the average number of children a woman would bear over the course of her lifetime if current age-specific fertility rates remained constant throughout her childbearing years. In 1970, 147 countries had TFR exceeding 3, nearly halving to 74 countries by 2007. During the same time, the number of countries with below-replacement TFR (2.1) rose from 2 to 56. In the 1960's all of the 46 Muslim-Majority nations of the world had TFR equal to or greater than 5. In 2008, only 11 of those countries have such high TFRs (UNCF 2010). While some countries in Europe are currently experiencing fertility rise, the increases are mostly from previously negative growth rates, bringing them closer to the world average.

same way. That is, people with two siblings, for example, are not expected to behave very much differently from someone who has three siblings. This combination of structural tendencies associated with sibship-size in the absence of cultural ones makes it an appropriate example of a less-institutionalized position. At the same time, unlike the case of women garment workers, having a given number of siblings or ‘occupying’ a given position in the sibship-size order is unlikely to generate a heightened sense of ontological uncertainty. Consequently, sibship-size is an example of a low-uncertainty less-institutionalized position. Declines in fertility the world over imply that the distribution of this less-institutionalized position is changing over time. Rapidly, more and more people have fewer siblings, on average.

Despite this ongoing significant change in family-structure, the relational implications of smaller-sized sibships remain understudied. Previous research examining the association between sibship-size and sociation has largely been focused on single-children (for example Claudy 1984, Falbo 1981, Rosenfeld 1966). But even this research has been described as scant and dated (cf. Trent and Spitze 2011). While research on single-children has successfully drawn our attention to the relationship between sibship-size and sociation, its current analytic framework is inadequate for two reasons. First, given that current fertility rates are converging on smaller family-sizes but not on single-child families, a focus on the social behavior of single-children is limited. Second, by collapsing all other sibship-sizes into a single comparative category, one conceals differences between higher-order sibship-sizes. While some recent research unpacks this dichotomized sibling category, it is mostly restricted to an in-depth examination of the role of sibship-size in particular relationships, such as those between parents and children

(Spitze and Logan 1991) or amongst siblings (Campbell, Connidis, and Davies 1999; Eriksen and Gerstel 2002).

I expand upon this research with three aims. One, consistent with the current world average total fertility rates, I examine if overall *support network composition* of individuals with zero, one, and two siblings (treated as distinct categories) differs from those with three or more siblings. Personal support networks consist of a focal actor (ego) and a set of alters that the ego reports having ties with. Composition refers to the distribution of role-relations in networks. Rather than emphasize the sociative uniqueness of single-children, by extending the investigation to higher-order sibship-sizes, this approach captures the breadth of declining fertility more fully. Two, there is considerable debate in the literature on whether personal network composition is similar within large-scale groups such as countries or its determinants are individual-level social structural factors such as age and gender. Multilevel models help to partition the variance of the dependent variable into components occurring at different levels. One way to adjudicate between individual- and country-level factors is by means of such models on cross-national data. With few exceptions (Hollinger and Haller 1990; Murphy 2008), multi-site studies of personal networks typically compare only two regions. A comparative analysis of two sites is limited in this regard as multilevel models are of little value when the number of groups is very small (Gelman and Hill 2007: 275). Drawing on a unique cross-national dataset from the International Social Survey Programme, I conduct an investigation spanning twenty-five nations using multilevel logistic regression in order to assess the relative contributions of individual and country-level determinants of personal network composition.

Three, I show that culturally-accepted understandings of relationships and structural tendencies implicit in having fewer siblings jointly produce patterns in network composition. More generally, adding to the growing body of literature on networks and meaning (for example, Bearman and Parigi 2004, Fuhse 2009, Gondal and McLean 2013, Ueno 2009, White 1992), this interaction demonstrates that the outcomes associated with less-institutionalized network structural positions are shaped by the culturally accepted, yet tacit content of multiple other relationships or netdoms (White 2008a) within which their occupants are embedded.

Sibship-Size and Personal Networks: Structural Effect of Availability

A critical area of investigation in personal networks pertains to the factors influencing their composition - the distribution of role-relations within networks. Highly influenced by classical literature (such as Simmel 1955; Tönnies 1957), one strand of research hypothesizes a causal relationship between economic modernization and network composition demonstrating that urbanization and/or economic development leads to a decline in the relevance of kin-ties, an increase in the importance of workplace and friendship ties, and a decline in the total number of ties (Fischer 1982; Lee et al. 2005; Litwak and Szelenyi 1969; Ruan et al. 1997).

Juxtaposed against modernization theory explanations, others (Fischer 2008; Fischer and Shavit 1995; Höllinger and Haller 1990; Murphy 2008) contend that the kin-centeredness of personal networks can be explained on the basis of cultural factors such as religiosity and orientation to individualism, not economic modernization. Murphy, for example, finds that individuals in countries with a higher concentration of religious

attendance have networks that are more kin-centered. Literature also draws attention to the dependence of network composition on traditional social structural factors such as gender, socioeconomic status, and age; the effects of which are argued to be similar around the world (Bastani 2007; Grossetti 2007; Hennig 2007). This research demonstrates that across diverse contexts women tend to be more involved with kin than men (Bastani 2007; Lee et al. 2005; Ruan et al 1997) and that socioeconomic status and kin involvement are negatively correlated (Degenne and Lebeaux 2005; Fisher 1982; Lee et al. 2005).

Fertility measured at the level of countries or other large-scale groups like religion or socioeconomic status is a macro-level construct comparable to urbanization or orientation to individuality. Viewed in this way, the effects of fertility decline on network composition can be evaluated by comparing networks across groups with differing fertility levels. While this technique is appropriate for macro-level comparisons, it overlooks the micro-level at which fertility decline manifests – within families, broadly defined. At this micro-level, one way to operationalize fertility decline is in terms of a reduction in the number of siblings individuals have, on average.

Recall from Chapter 2 that a less-institutionalized position is relationally meaningful (associated with some structural tendencies) but culturally emergent or non-meaningful. With respect to the former criterion, a fundamental structural effect of having fewer siblings is that such individuals have a smaller pool of available close-kin alters with whom to construct social support networks. Consequently, as compared to those with many siblings, social support networks of people with fewer siblings should be composed of different sorts of relations. More specifically, support networks of

individuals with fewer siblings are more likely to be composed of non-sibling ties. This could occur as a matter of sheer availability – the more siblings one has, the more likely frequency of contact, geographical proximity, and emotional closeness with at least one of them (Connidis and Davies 1992; Miner and Uhlenberg 1997). Relatedly, lower availability of siblings may also lead individuals to develop stronger ties with other relations such as parents and close friends through the life-course. If sibship-size shapes the construction of support networks, we should find such ‘compositional adjustment’ to occur in systematic ways.

One possibility is that other close *familial* ties such as parents, children, and spouses rather than extra-familial ties play a more prominent role in the personal networks of single-children and individuals with fewer siblings. This argument emphasizes the primacy of familial ties such that individuals ‘compensate’ for the reduced availability of one type of familial tie by substituting it with another type of kin relationship. Consistent with this line of argument, research on single-children shows that singletons have stronger ties with their parents and are more likely to include them in their networks (Kidwell 1978; Polit and Falbo 1987; Riggio 1999). This suggests the following hypothesis:

H1: As compared with people with more siblings, people with few or no siblings are more likely to compose personal networks that include close-kin ties including spouse, parents, and children.

An alternative adaptive outcome of having fewer siblings is the diversion of networks towards non-kin ties such as friends and colleagues. The spirit of this

‘downward’ adaptation is captured in the Hierarchical Compensatory Model of social support (Cantor 1979; Carr and Khodyakov 2007). According to this model, individuals have a rank-ordered preference for receiving assistance from others, such that adults first seek support from close family members and only when kin are absent or unavailable do they compensate for their absence by turning to other ties. Substantiating this model, Roberts et al. (2009), find that family-size is positively related to the number of kin ties in the personal networks of individuals. It also suggests that non-kin ties such as close friends are similar to friends with respect to the exchange of social support (Voorpostel and van der Lippe 2007). This ‘downward’ adaptation forms the basis of the second hypothesis:

H2: As compared with people with more siblings, people with few siblings are more likely to compose networks with extended-kin and non-kin ties.

Finally, individuals may respond to the lower availability of siblings by constructing smaller-sized personal networks rather than substituting other ties for siblings. Likewise, the depersonalization of personal networks – substituting professional services for personal ties - is another possibility. In support of these arguments, research on single-children indicates that they are more self-sufficient and possess a lower need for affiliation than those with siblings (Brody 1998; Claudy 1984; Falbo 1981; Rosenfeld 1966; Trent and Spitze 2011). In contrast, other research suggests that these tendencies are either not significant (Falbo 1978; Kitzman, Cohen, and Lockwood 2002) or attributable to socioeconomic status (Blake, Richardson, and Bhattacharya 1991). Extending this research to higher-order sibship-sizes, I test the following hypothesis:

H3: *As compared with people with more siblings, people with few or no siblings are more likely report having no one to turn to or draw on professionals for social support.*

Sibship-size and Personal Networks: Relational Content from other Netdoms

Hypotheses 1-2 pertain only to the network structural aspect of who is included in networks. This line of questioning is consistent with traditional research in social networks which has been primarily been concerned with the structure of relationships. As such, the hypotheses disregard the cultural content of ties, a topic that has received more interest in research on social networks in recent years (see, for example, Bearman and Parigi 2004; Gondal and McLean 2013; McLean 2007; Pachucki and Breiger 2004; White 2008a). For example, the hypotheses suggest that individuals with fewer siblings construct networks that are more inclusive of parents. But they fail to specify more precisely if and how shared understandings of the content of highly-institutionalized positions like parental roles are implicated in this structural effects of sibship-size. The classic way to study relational content is through rich interviews by eliciting descriptions of particular relationships and/or observing interaction. Yet, relational content can also be studied on the basis of data gathered in large-scale datasets. One way to do so is by operationalizing tie-content in terms of the expectations of or actual flows of support through ties. This approach draws on White's (1998a, 2006) conceptualization of tie-content in terms of 'stories' people tell of their relationships which gives concrete form to otherwise abstractly-defined relations. For example, we may find that people report talking with their friends about problems they face in their romantic relationships. This description - discussing relationship-related issues - helps to clarify the substance of the

friendship-tie. Alternatively, we may find that young people expect their parents to help them out financially. Here stories take the form of social support – emotional in the case of friends and financial in the case of parents. According to White, the set of reflexive accounts that are ‘accepted’ stories of a tie in specific contexts form the *warranties* or the substance of that tie. These stories are accepted in that they reflect the shared understandings of the expectations and entailments of that tie. Thus, whereas a story is a description of a relationship, warranties are the stories that are frequently deployed to describe the content of a relationship. Conceptually, tie-warranty is similar to relational framing (Goffman 1974) such that dyadic-level instantiations of a tie are shaped by the broader cultural understandings of those ties (McLean 1998; Yeung 2005). Martin (2009) likewise describes such shared awareness of relational content as culturally institutionalized forms of relationships.

The prevalence of such cultural institutionalization should be empirically evident as regularities connecting role-relations to tie-content. Indeed, studies across diverse contexts reveal that the parent role-relation is most often composed of financial support, advice, and exigent support (Degenne and Lebeaux 2005; Lee, Ruan, and Lai 2005; Plickert, Côté, Wellman 2007; Wellman and Wortley 1990); friendship of emotional support (Lai 2001; Litwak and Szelenyi 1969; Wellman 1979; Wellman and Wortley 1990); neighbors are important as providers of short-term services and emergency care (Litwak and Szelenyi 1969; Plickert, Côté, Wellman 2007); and siblings for both emotional and instrumental support such as household work, companionship, and support during marital problems (Lai 2001; Wellman and Wortley 1990; Wetherell, Plakans, Wellman 1994).

Cultural institutionalization of relational content implies that individuals should expect specific types of support from particular ties. For example, individuals should think it appropriate to expect exigent support from neighbors and emotional support from friends. An important question stemming from this is if and the extent to which cultural expectations of a variety of ties moderate the effects of sibship-size to jointly produce patterns in network composition. That is, if individuals with fewer siblings are more prone to composing networks with parents, as the first hypothesis posits, being *knowledgeable* about appropriate parental tie-content, should they be more likely to turn to parents for particular types of support and not others? This type of relational knowledgeability need not be explicit. More likely, as argued in Chapter 2, it is part of the tacit rules of social behavior that people know and can invoke without being able to articulate to themselves or to others that they are doing so. Using Giddens's (1986) terminology, such implicit knowledge of appropriate relational content is part of one's practical or automatic consciousness. If, for instance, it is culturally appropriate to turn to parents for financial support but less so for emotional support, then, being tacitly aware of those rules, individuals with fewer siblings should turn to their parents for financial support but not for emotional support. Likewise, the higher propensity to turn to friends (Hypothesis 2) amongst those with fewer siblings should manifest for those relational contents typically associated with friendship.

In statistical terms, for the hypotheses outlined above, 'automatic' invocation of appropriate relational contents can be tested by means of an interaction between tie-content and sibship-size. This statistical interaction effectively captures netdom spillover effects outlined in Chapter 2. If the interaction produces a replication of the sibship-size

effect across support types – if those with fewer siblings are more likely to turn to parents for all types of support (including those typically associated with different types of ties) rather than only those characteristic of parental ties, for example, – then tacit knowledge of appropriate tie-content of different types of relations has little bearing on the relationship between sibship-size and network composition. This shows that the compensatory structural effect of sibling-availability dominates while tacit cultural understandings of relationships from other netdoms are irrelevant. Such a finding would challenge the view that cultural context and subjective understandings are important supporting, instead, a highly structural type of network analysis. Even so, a dominant structural effect of sibship-size has cultural implications. By attributing additional dimensions to existing relational understandings, this outcome implies that having fewer siblings makes for more expansive relational understandings, thereby rearticulating institutionalized relational content. If the interaction replicates the original relationship between sibship-size and network composition for some types of support and not others – if those with fewer siblings are more likely to turn to parents in general, but this greater reliance holds only for the types of support typically associated with parents – then the interaction specifies the tie-contents for which the structural hypothesis holds.

Substantively, this finding has two implications. One, it shows that the effects of sibship-size as a less-institutionalized position that does *not* generate uncertainties for its occupants are moderated by occupants' tacit knowledge of the cultural content of a variety of other ties. Alternatively stated, it implies there are spillover effects from other netdoms (namely, friendship, sibling, parental, neighbor, etc. relations) into sibship-size

as a less-institutionalized position. Two, statistical interaction implies a reinforcement and reproduction of existing relational content.

Data and Multilevel Modeling Methodology

The data for this study come from the ISSP ‘Social Relations and Social Support’ (Social Networks II) component collected in twenty-five countries over the period 2000-2002 for which data on all variables were completely available. The sample is largely composed of European, North America, and Australian high and middle income countries. In addition, the dataset also contains samples from Japan, Philippines, Israel, Brazil, and Chile. The samples were drawn using either simple random representative or stratified multi-stage techniques. Table 3-1 lists some of the descriptive properties of the data organized by region. The data comprise 32,712 respondents. Barring a couple of exceptions, the average age of the respondents is over forty, with the overall mean age at forty-six. Consequently, the results speak more to older rather than younger individuals. The sample has an approximately even distribution with respect to sex. The majority of the sample is either married or lives as if married. The percentage with university degrees varies by country, but the overall mean is about seventeen percent. The survey asked respondents to identify the number of living, adult (older than 18-years)¹³ half, full, or step brothers and/or sisters they had. Responses show that 14.5 percent of the respondents are singletons, 26.5 percent have one sibling, 21 percent have two siblings, and the remaining 38 percent are part of larger sized sibships.

[Table 3-1 (about here)]

¹³As the average age is mostly in the forties and fifties, the margin of error of having siblings younger than eighteen is likely to be low.

In addition to demographic information, the ISSP uses the exchange-generator methodology to collect information on the personal networks of individuals. Three questions are used eliciting both first and second choices totaling six questions.

1. First suppose, you had the 'flu and had to stay in bed for a few days and needed help around the house, with shopping and so on. Who would you turn to (first/second) for help?

2. Now suppose you needed to borrow a large sum of money. Who would you turn to (first/second) for help?

3. Now suppose you felt just a bit down or depressed, and you wanted to talk about it. Who would you turn to (first/second) for help?

[Husband/wife/partner; mother; father; daughter; daughter-in-law; son; son-in-law; sister; brother; other blood relative; other in-law relative; god parent; close friend; neighbor; someone you work with; employer; government agency or someone at social services; bank or credit union; private money lender; member of clergy; psychologist; family doctor; self-help group; someone you pay; someone else; and no one (not all these options were available for every question; but in general; each question had about 18 options)]

Dependent Variables: The responses to these questions were consistently dichotomized to reflect the three hypotheses outlined above. More specifically with respect to H1, for each of the six questions above, if a respondent answered mother or father, the response was coded 1; otherwise it was coded 0. This resulted in a set of six dichotomous responses (parent or not parent) for each respondent. A similar coding scheme was adopted for the remaining hypotheses: spouse and children as other parts of H1; extended-kin, close friend, neighbor, and colleague for each part of H2; and no one and/or professional agent (such as social services) for H3.

Independent Variables: Following Hox (2002), the lowest-level independent variable is a categorical variable taking the values of the six tie-content questions – first and second choice in illness, first and second choice to borrow money, and first and second choice when feeling low. I treat this variable as representative of the content of ties. For consistency, first choice in illness is the omitted category in all models. Sibship-size is the key individual-level independent variable. Given the paucity of research linking sibship-size to patterns of sociation, there is no straightforward justification for distinguishing between small and large sibship-sizes. In previous research, either single-children have been treated as a distinctive category or sibship-size has been treated as a linear variable (for example Miner and Uhlenberg 1997). The former suppresses potential differences amongst higher order sibling categories and the latter implies that the added effect of each sibling is identical.

I follow two approaches to differentiate between small and big sibship-sizes. First, I follow an empirically-grounded approach. Towards this end, I conducted a stepwise regression analysis sequentially adding higher sibship-sizes to the model and treating correspondingly smaller sibship-sizes as the omitted category. Thus, the first model included zero siblings and omitted one or more siblings (equivalent to the singleton-sibling dichotomous model). The next model was expanded to include zero and one siblings as distinct dummies with two or more siblings as omitted. This process was continued until further additions to the model generally ceased to produce significant results, which resulted in three or more siblings as the omitted category. Second, average TFR around the world is approximately 2.6 (UNWPP 2008). Consistent with average world TFR, the final model equations include 0, 1, and 2 siblings as separate categories

with 3 or more siblings as the omitted category. The data do not distinguish between full, half, and step-siblings. It seems reasonable to assume that individuals feel closer and more comfortable with full-siblings than half or step ones if they have spent more of the formative childhood years with full-siblings. At the same time, increasing rates of divorce, non-traditional family structures, and remarriage, imply that sibships are more likely than ever to include step and half-siblings. Consequently, the relational implications of such forms of sibships can scarcely be overlooked. Nevertheless, the effects may be distinct from full-siblings. But the current data do not allow for those effects to be explicitly differentiated.

Control Variables: The hypotheses are tested net of a number of variables that have previously been argued to have a bearing on the composition of personal networks. At the individual-level, these include gender, age (coded in decades in the dataset: 15-24, 35-44, 45-54, 55-64, 65-101), educational attainment (still in school/university, incomplete or completed primary, incomplete or completed secondary, incomplete or completed university), work status (full-time/self-employed, part-time or less than part-time, unemployed/not in labor force, student, and retired), living father, living mother, number of adult children, subjective socioeconomic class, frequency of religious attendance, geographical distance from mother, and marital status (married/living as if married, divorced or separated, widowed, and no current partner/spouse). At the country-level, I test the effect of three variables. In line with modernization theory arguments, I control for per capita GDP (UNSD 2010) and Total Fertility Rates (UNCF 2010). Third, in accordance with Murphy's (2008) argument that religiosity is positively associated with kin-concentration in networks, I created a religious attendance 'context' variable.

Context variables are typically created in multilevel studies by calculating averages of lower-level variables to generate higher-level variables. In this dataset, religious attendance is coded in two ways. One, in terms of attendance at religious services and, two, participation in a religious organization. Only the latter variable, categorized as attendance over the past twelve months – more than twice (1), once or twice (2), belong but do not participate (3), and do not belong to such a group (4), was available for all the countries in the sample. The religiosity variable is the mean of these values for each country.¹⁴

Method: The effect of sibship-size and relational content on network composition is tested using multilevel (hierarchical) binary logistic regression with penalized quasi-likelihood estimation. Multilevel models are typically applied to data that occur at multiple levels such as students in classrooms within schools. The basic principle of multilevel modeling is that variation in the dependent variable can be traced to sources at multiple levels. In two-level data, say individuals in countries, variance of an individual-level dependent variable (e.g. income-levels) will have both individual-level explanations (e.g. education) and country-level explanations (e.g. manufacturing versus service economy). The task of multilevel modeling involves estimating coefficients of variables at different levels with proper accounting for the error structure at multiple levels (for details, see Hox 2002; Snijders and Bosker 1999). My motivation with cross-national data is to seek the best possible estimates of coefficients at different levels with appropriate accounting for uncertainty in inherently multilevel data, not to conduct cross-national comparisons.

¹⁴A similar fertility contextual variable created from the average sibship-size in countries yielded results comparable to the TFR measure.

Sinijders, Spreen, and Zwaagstra (1995) demonstrate the utility of multilevel modeling for personal network data using two-level models – networks nested within individuals. As they argue, the various relations identified by each individual are likely to be interdependent and therefore should not be treated as independent observations in a standard regression. This means if our interest is in network composition, we cannot treat the one choice (say, parent) as independent from the second (say, friend) for the same individual. A multilevel approach where personal networks are considered to be nested within individuals accounts for this interdependence. Hox (2002, chapter 9) makes a similar argument regarding multiple measures (say p in number) of the same construct. These interdependent p measures (which could be a personal network) can be modeled by creating a distinct lower level and defining a categorical independent variable whose categories are the p questions. In line with the work of Hox and Snijders et al, the design of the ISSP dataset calls for a three-level nested structure – network responses nested within individuals and individuals nested within countries. The dependent variables outlined above are at the lowest, network-level. The independent variables are the categorical variable indicating tie-content, individual-level, and country-level variables. I operationalize tie-content in terms of the six exchange-generator network questions. This tie-content level corresponds to tie-warranties outlined above. Specifically, the tie-content dummies answer the following question: what contents are most associated with particular role-relations? To the extent that choice of alter is systematically determined by content (e.g. parents are often chosen for financial support but not emotional support), it reflects cultural expectations of relations. The individual-level captures effects of individual-level factors affecting network composition including sibship-size. The

country-level is informative of the extent to which personal network composition varies across countries.

Analytical Strategy: One of the key uses of multilevel models is to determine how the variance of the dependent variable is distributed across levels. This will aid in deciphering how much of the variation in personal network composition comes from the two. A large proportion of individual-level variance supports research in favor of individual-level determination of personal networks; and high country-level proportional variance would indicate that there is wide variation in personal network composition across countries suggesting that cross-national comparisons are an appropriate technique of analysis. To glean these proportions, I first estimate the variance components at the individual- and country-levels using a random intercept model. Next, I add sibship-size to the equation with the aim of explaining that variance and testing its effect on network composition (for a similar analysis of longitudinal data, see Rink, Phalet, and Swyngedouw 2009). Subsequently, I include control variables at the individual and country levels. Finally, I interact tie-content with sibship-size to test the extent to which the former moderates the effect of the latter on network composition. The random-intercept model I utilize is depicted in Equation 1 where γ is the average intercept, α coefficients are for network-level, β coefficients are for individual-level, and δ coefficients are for country-level variables. U and V represent the variance of the intercept at the individual- and the country-levels respectively. The models are fit using the GLMMPQL algorithm in the R (GUI) environment (Schall 1991).

$$\log it(P_{ijk}) = \gamma_0 + \sum_{l=1}^r \alpha_l x_{ijk} + \sum_{m=1}^s \beta_m y_{jk} + \sum_{n=1}^t \delta_n z_k + U_{0j} + V_{0k} \quad (1)$$

Results

Baseline Models

[Figure 3-1 (about here)]

Baseline models show how the variance in the dependent variables is distributed across the individual- and country-levels. The results for the variances of the baseline models are shown in Figure 3-1. Following Hox (2002), rather than fitting baseline models with just the intercept, I fit one that includes the intercept and dummy variables for the lowest network-level. Unlike models where the dependent variable is normally distributed, the lowest-level variance in logistic regression models is not estimated, rather it is assumed to equal the standard logistic distribution, $\frac{\pi^2}{3} = 3.29$ (Snijders and Bosker 1999, 224). Applying this value, the fraction of total variability in the dependent variables due to the two other levels is shown in Figure 3-1. A comparison of the individual- and country-level values indicates that individual-level variability contributes substantially more to dependent variable variances than the country-level across all hypotheses, except spousal/partner responses. The latter case suggests that, having accounted for those who are married or live as if they are, there is very little variation in reporting spouse/partner at the individual level. In other cases, the individual-level variances are 12 to 28 times the size of country-level variances. These results suggest that individual-level factors play a considerably greater role in determining personal network composition (at least of the role-relations included here) than country-level factors.

Structural Effects of Sibship-Size

[Figures 3-2 and 3-3 (about here)]

Figures 3-2 and 3-3 show the results of modeling whether or not respondents with 0-2 siblings are more likely than those with more siblings to choose spouses, parents, children, extended-kin (other blood relative, other in-law relative, and god parent), close friends, neighbors, colleagues, and no one/professional services.¹⁵ The bars represent odds ratios adjusted for all the individual and country-level control variables listed previously. Given the large sample-size, only differences significant at the 0.001 and 0.0001 levels are depicted. The figures reveal that those with fewer siblings are not significantly more likely compose personal networks of spouses, children, or colleagues, after all potential confounds are controlled. Those with zero, one, or two siblings are systematically more likely to turn to parents. Those with zero or one sibling are also more prone to extended-kin and close friends. Finally, singletons are additionally more likely to turn to neighbors and report having smaller-sized or depersonalized networks. These figures partially support the availability structural hypotheses that individuals with fewer siblings are more likely to compose networks with close-kin and non-kin ties and they are more prone to having smaller-sized or depersonalized networks.

In the following sections, I elaborate only upon the role-relations whose association with sibship-size is statistically significant in Figures 3-2 and 3-3. As extended-kin is composed of a mixed-bag of relations, it is harder to make sense of the content of this ambiguously defined tie. Consequently, I do not present more in-depth

¹⁵ The results are depicted graphically for ease of presentation and interpretation. Tabular results are available from the author upon request.

results for that category. It is nevertheless significant that those with 0-1 siblings are also more prone to composing networks with extended-kin relations.

Institutionalized Relational Content

[Figure 3-4 (about here)]

Figure 3-4 depicts the typical content associated with particular role-relations in comparison to first choice in illness. The figure provides evidence in favor of the institutionalized cultural content of role-relationships. The bars depict odds ratios adjusted for all control variables as well as sibship-size. The bars for parents show that as compared to first choice in illness, parents are more likely to be named for second choice in illness and both choices in financial support but less likely to be named as sources of emotional support. Friends, in contrast, are considerably more likely to be named for both choices in emotional support but not for first choice in financial support. Neighbors are significantly more likely to be viewed as providers of alternative support during an illness and for emotional support but *not* for financial support. Lastly, reporting no one or professional services is higher for all types of support compared to first choice in illness.

Figures 3-2 and 3-3 demonstrate the structural tendency that those with fewer siblings are more likely to turn to certain role-relations. This provides evidence in favor of structural regularities associated with sibship-size as a less-institutionalized position. Figure 3-4, suggestive of institutionalized cultural content of those role-relations in terms of understandings of flows of social support, is largely consistent with previous studies. Next, I test the extent to which such institutionalized relational content spills over to moderate the effect of sibship-size on network composition.

Parents

[Figure 3-5 (about here)]

Figure 3-5 compares zero, one, and two siblings to three or more with respect to their tendency to name their parents for all six tie-contents. The bars depict odds ratios adjusted for all individual and country-level control variables. Nested models (not shown) demonstrate that the proportion of explained variance increases considerably when individual-level control variables are included but does not increase by much with the addition of country-level variables. Moreover, the proportion of the variance attributable to the country-level declines when individual-level variables are added indicating that some of the country-level variance in Figure 3-5 is attributable to different types of individuals residing in those countries or population composition effects. Lastly, none of the country-level variables are significantly related to the inclusion of parents in personal networks. These findings support the earlier variance decomposition results that individual-level variables outweigh country-level effects in structuring personal network composition.

According to Figure 3-5, those with fewer siblings are more likely to turn to parents for support and, according to Figure 3-4, parents are viewed as providers of financial and exigent support, but not emotional support. Figure 3-5 shows that the greater tendency of those with fewer siblings to draw on their parents is present *only* for exigent and financial support but not for emotional support. As compared to those with three or more siblings, those with fewer siblings are consistently and significantly more likely to say they would turn to their parents for both choices in exigent and financial

support but are no different from them for either choice in emotional support. It is thus evident that the effect of sibship-size is not the same across tie-content. Rather, those with fewer siblings are only more likely than those with more siblings to turn to their parents for the types of support typically associated with the parental tie. Culturally institutionalized understandings of the parental relationship meaningfully shape the diversion of networks towards parents implied by the structural tendency of having fewer siblings.

Close Friend

[Figure 3-6 about here]

Figure 3-3 shows that as compared to those with three or more siblings, singletons and those with one sibling are significantly more likely to turn to their close friends in need. Figure 3-4 demonstrates that, consistent with previous research, friends are most likely to be viewed as providers of emotional support. Moreover, expanding upon previous research, the figure shows that close friends are also crucial alternative sources of support. In the case of close friends, too, the addition of individual-level variables considerably improves the model fit while country-level variables produce insignificant coefficients and fail to contribute much towards explained variation (models not shown). Figure 3-6 shows the results of modeling whether the structural tendency of substituting siblings with friends for those with fewer siblings holds across all types of tie-content. The figure demonstrates that as compared to those who have more, individuals with 0-2 siblings are significantly more likely to turn to close friends for first choice in emotional support. Thus, like in the case with parents, even though the availability effect of sibship-

size suggests that individuals with zero or one sibling are more likely to divert networks towards close friends, this tendency is most pronounced for the type of support typically associated with friendship. Singletons, on the other hand, are more likely to turn to close friends for all sorts of support including first choice in financial support indicative of a more expansive view of friendship ties.

Neighbor

[Figure 3-7 about here]

Figure 3-3 shows that only single-children are significantly more likely than those with three or more siblings to compose personal networks with neighbors. According to Figure 3-4, the neighborly relation is more likely to be viewed as a source of exigent support and an alternative source of emotional support. Consistent with institutionalized content, Figure 3-7 shows that the net of control variables, those with 0-2 siblings are significantly more likely than those with three or more to view neighbors an alternative source of exigent support. In addition, those with 0-1 sibling are also more likely to seek out neighbors as a first choice of exigent support. Finally, single-children also have more expansive views of neighborly ties as evident from their greater tendency to turn to them for financial help. Country-level factors are not statistically significant and contribute little towards the explained variance.

Isolation and Depersonalization

[Figure 3-8 about here]

The results of modeling the final hypothesis – greater likelihood of isolation – are shown in Figure 3-8. Figure 3-3 demonstrates that only single-child adults are more likely to report inadequate access to social support in the form of having no one to turn to or seeking out non-personal ties. Similar to other choices, the effect of country-level variables is not significant. The figure shows that except first choices in financial and emotional support, single-children are significantly more likely to report isolation or depersonalization of personal networks for all other types of support. Neither those with one sibling, nor those with two siblings display any tendencies towards such isolation suggesting that the presence of even one sibling is enough to mitigate inadequacies in access to personal social support.

Discussion

Despite current decline in fertility rates, with the exception of single-children, surprisingly little has been said about its relational implications. Comparing small and large sibling-sizes, I investigate how the composition of personal networks varies on the basis of sibship-size and relational content. The results are indicative of several noteworthy findings.

First, the results demonstrate that individual-level social structural determinants considerably outweigh country-level factors in shaping personal network composition. Given the consistently and considerably higher individual-level variances from Figure 3-1, the results here support recent research (e.g. Bastani 2007; Grossetti 2007) favoring the

micro-level determination of personal networks. Furthermore, decreases in the country-level unexplained variance components as a result of including individual-level factors indicate that some of that country-level variability is, in fact, attributable to differences in the type of individuals residing in those countries and not a country-level contextual effect. The consistent non-significance of the coefficients of country-level variables supports this finding. Preliminary analyses of the data (not shown) using hierarchical clustering grouped countries into geographically, economically, culturally, and fertility-wise heterogeneous clusters. It is not surprising thus that country-level variables yielded insignificant coefficients. This finding that personal network composition is relatively stable across countries is an important one in light of debates surrounding cross-national variations in personal networks (e.g. Fischer and Shavit 1995; Höllinger and Haller 1990; Murphy 2008).

Second, the results show associations of tie-content with role-relations that are largely consistent with previous findings. The parental relation is viewed as composed of exigent and financial support but less of emotional support. Close friends are more likely to be viewed as providers of emotional support. Friends also fill-in as alternative sources of exigent and financial support. Neighbors likewise occupy the role of alternative sources of support, especially for exigent support. Following White (2008a, 2006), these associations between expectations of social support and relations suggest that role-relations are a form of netdoms. Recall that netdoms are a marriage of networks of relations and domains of shared meaning. Since roles imply both relational regularities (net) and behavioral expectations (dom), they can be treated as such.

Third, the results demonstrate that an important structural outcome of having fewer siblings is the diversion of networks towards other role-relations in systematic ways. An important implication of this finding is that the *availability* of kin-ties meaningfully structures the construction of support networks. We could also infer that other pools of available alters that are likewise constrained by size such as the workplace, neighborhood, and school, may shape personal networks in a similar way. Individuals working in small-sized organizations, for instance, may regularly draw on support from ties other than their colleagues. In contrast, coworkers may play a more prominent role in the social support networks of their counterparts in larger-sized organizations. To the extent networks are also shaped by other factors such as gender, skewed gender distributions in an organization may lead those in the minority to construct networks outside of the workplace. Similar outcomes may obtain in other contexts such as in schools and neighborhoods generally and/or more specifically with respect to factors structuring networks such as race and socioeconomic status. This is not to suggest that smaller-sized groups are not suitable for the creation of close, supportive ties, but that *sheer availability* also plays an important role in the construction of supportive ties.

With respect to sibship-size, the diversion is most pronounced towards parents. Individuals who have fewer siblings ‘compensate’ by being more reliant on their parents. In a sense, parents substitute for siblings by providing support that might otherwise have been drawn from brothers/sisters. To the extent lower fertility is associated with delayed childbirth, the greater reliance on parents, especially for financial support, is suggestive of grounds to rethink the current age-structure of dependency ratios. Close friends and neighbors likewise fill-in for siblings by playing a more significant role in the personal

networks of those with fewer siblings. On the one hand, this reliance on non-kin ties signals greater diversity in networks. On the other, earlier research (Degenne and Lebeaux 2005; Wellman et al. 1997) suggests that friends and neighbors that have been previously been identified as intimate tend to disappear from the personal networks of individuals over time, whereas kin-ties have a much higher chance of surviving. While a longitudinal analysis is needed to test if kin-persistence and non-kin-fragility applies equally across sibship-sizes, the greater reliance on non-kin ties of those with fewer siblings suggests that they are perhaps at a greater risk of being engaged in ties that are less stable over time.

The overall texture of this compositional adjustment suggests that both familial and extra-familial ties absorb the redirection of social support attributable to the reduced availability of siblings. The results suggest that both parents and close friends are viewed as appropriate ‘substitutes’ for siblings with respect to social support. These findings are contrary to that hierarchical compensatory model of social support that accords primacy to familial ties. That those with fewer siblings are not more likely to turn to other familial ties such as children and spouse/partner for social support is also noteworthy as it suggests that the content of those ties is perceived as meaningfully different from those of siblings.

Single-children also have a greater propensity to report having no one to turn to or seeking out the services of professionals. Network instruments such as the one used here is meant to capture the close personal ties of individuals. The tendency amongst single-child adults to ‘replace’ personal ties with professionals is suggestive of a depersonalization of personal networks and their greater tendency to report ‘no one’ is

indicative of smaller-sized networks. This finding is consistent with previous research that single-children are at a greater risk for isolation and possess a lower need for affiliation. From a policy perspective it is also important to understand what type of support is most likely to elicit professional/no one responses. Whereas individuals may readily employ professional services like bank loans for financial needs, responding no one or seeking professional services for support during an illness conveys a qualitatively different and more troubling kind of social disengagement.

Yet, the tendency to adjust for the lower availability of siblings by constructing networks with other ties or smaller-sized and depersonalized networks is shaped by the institutionalized cultural content of a variety of relationships. In building networks, individuals are not simply acting on the structural tendency implicated in the availability of siblings, they are also tacitly aware of the expectations of support laden on various relationships and acting on the basis of those norms. Fuhse (2009) argues that ‘order principles’ consisting of opportunity structures and cultural categories produce regularities in relational expectations and transactions. Opportunity structures like place of residence affect networks by enabling or restricting access and contact. Cultural categories order interactions in expected ways as individuals interact with others through the medium of roles and identities. Sibship-size, as a factor producing order in networks, operates in both domains. Having fewer siblings limits the opportunities of constructing support networks redirecting networks to other ties, but in culturally expected ways. In support of this joint effect, the results indicate that when those with fewer siblings substitute parents for the lower availability of siblings, they do so for the types of support typically associated with parents. Likewise the sibship-size-based adjustment towards

friends and neighbors is also most pronounced for the types of support characteristic of those role-relations. The data demonstrate that institutionalized tie-content limits and clarifies that scope of the structural availability effect of sibship-size. This interaction between structural tendency and cultural expectations implies a reproduction and implicit reinforcement of existing relational content with declining fertility.

At the same time, singletons are prone to more expansive understandings of non-kin relationships. In addition to the greater likelihood of drawing exigent support from neighbors as displayed by their one- and two-sibling counterparts, single-children are also more likely to turn to their neighbors for financial support. Amongst the four categories of siblings utilized here – zero, one, two, and three or more, single-children are alone in this regard. In contrast to other relations, single-children are also significantly more likely turn to close friends for exigent and financial support. In their case, the structural opportunity constraint presented by the complete absence of siblings as potential network alters as well as a lack of experiencing siblinghood overshadow some of the culturally institutionalized expectations imposed upon relationships. Single-children contribute towards the reproduction of institutionalized parental roles, but by attributing additional dimensions of supportive content to non-kin relationships, they partake in rearticulating the substance of those relations.

There are some limitations to this research. Due to data constraints, I have not been able to account for the effects of birth-order, age, and gender composition of sibships. The data do not differentiate between step, half, or full-siblings which could also be a confounding variable. Moreover, the data pertain mostly to high and middle income countries in Europe, North America, and Australia. It remains to be seen how

family-size has a bearing on personal network composition in other regions of the world. It is also possible that some other factors like race and parental age can explain the effect of sibship-size. But the unavailability of these measures in the dataset makes it impossible to test the effects of such factors.

Despite these limitations, the results from this research are suggestive of some important results that merit further investigation. The findings demonstrate that, in addition to individual-level factors such as age and gender, sibship-size, in a form richer than the singleton-sibling dichotomy, ought to be treated as an important factor affecting the composition and content of relationships. While single-children exhibit an amplified tendency towards sociational differences, those with one and two siblings also compose networks differently from those with more siblings. Given the absence of country-level effects, in a climate of declining fertility, these differences have the potential to significantly affect the current and future framing of those ties across diverse contexts. The results here suggest that continuing declines in fertility rates could bring a rising role of parents in the lives of children but in a narrowly conceived instrumental capacity; a similarly greater presence of friends especially for emotional support and neighbors for instrumental support; an increased reliance on professional services; and possibly smaller-sized and less stable personal networks. In the absence of longitudinal data, these inferences should be treated as suggestive rather than conclusive. Nevertheless, such an approach to the analysis of close personal networks can be crucial for intriguing cases like China and India where the unintended relational consequences of state-advocated population control measures, including, the single-child policy initiative, have the potential to seriously alter the social landscape in the years to come.

Lastly, the results from this study demonstrate that structural explanations do not fully account for regularities in personal network composition associated with sibship-size as a less-institutionalized position. Rather, relational understandings across a variety of ties play an important role in producing outcomes. As distinct from the case of garment workers, sibship-size does not normally create conditions for ambiguity and uncertainty in interpretation. Consequently, rather than deliberative processes, I have argued that it is tacit knowledge from other domains that spills over to moderate the effect of sibship-size on personal network composition. In the next chapter, I analyze another example of a less-institutionalized position, but this time one that imposes a intermediate levels of uncertainty for its occupants.

Table 3-1: Data Descriptives by Region

Country	Sample Size	Sibship-Size (percentage)			Mean Age	Male (%)	Married or Living as if Married (%)	University Completed (%)
		<i>0</i>	<i>1</i>	<i>2</i>				
Australia	1352	8.6	25.6	23.9	55.2	46.4	70.6	24.3
Austria	1011	20.3	26.8	21.3	52.1	40.2	56.5	7.0
Brazil	2000	8.1	11.9	13.0	38.6	49.3	45.0	--
Canada	1115	8.7	17.4	20.7	48.7	47.8	73.3	23.5
Chile	1504	9.0	13.4	16.6	43.8	59.1	53.9	8.9
Cyprus	1006	13.7	31.6	30.3	40.9	50.0	68.4	21.4
Czech Republic	1200	18.7	43.2	21.8	44.4	40.1	58.2	10.5
Denmark	1293	11.4	33.0	26.0	48.6	44.4	56.5	10.4
Finland	1439	12.6	28.6	21.2	43.8	43.5	66.1	15.9
France	1398	13.0	30.3	22.7	46.2	45.6	59.0	39
Germany	1369	15.5	36.0	21.3	46.4	49.7	57.9	10.7
Hungary	1524	20.9	39.0	20.5	51.2	43.2	51.9	4.1
Israel	1207	13.3	23.0	15.7	42.0	40.7	62.3	23.1
Italy	999	22.5	33.6	24.5	45.8	47.9	88.0	24.0
Japan	1321	11.1	29.6	22.4	48.2	46.7	68.1	14.6
Latvia	1000	29.5	39.5	16.7	43.9	42.2	53.3	17.1
New Zealand	1146	7.9	20.9	24.3	50.2	42.6	63.4	31.5
N. Ireland	1407	14.3	19.5	18.8	49.0	38.8	52.1	14.10
Norway	1560	11.1	28.7	26.7	44.7	47.6	55.8	23.3
Philippines	1200	6.8	7.7	10.5	41.7	50.0	76.8	14.8
Poland	1221	14.4	27.8	24.5	47.9	42.5	61.2	9.8
Russia	2000	24.1	36.4	18.3	44.6	45.5	57.2	14.6
Slovenia	1077	17.6	34.4	20.2	44.9	44.4	65.2	13.1
Spain	1214	14.1	24.9	22.2	45.9	48.2	59.8	6.6
USA	1149	11.2	21.9	22.5	45.5	48.3	43.6	26.0
Total/Average	32712	14.3	27.4	21	46.2	45.8	61	17

Figure 3-1: Distribution of Variance across Levels

Multilevel logistic regression baseline models showing the distribution of variance across levels.

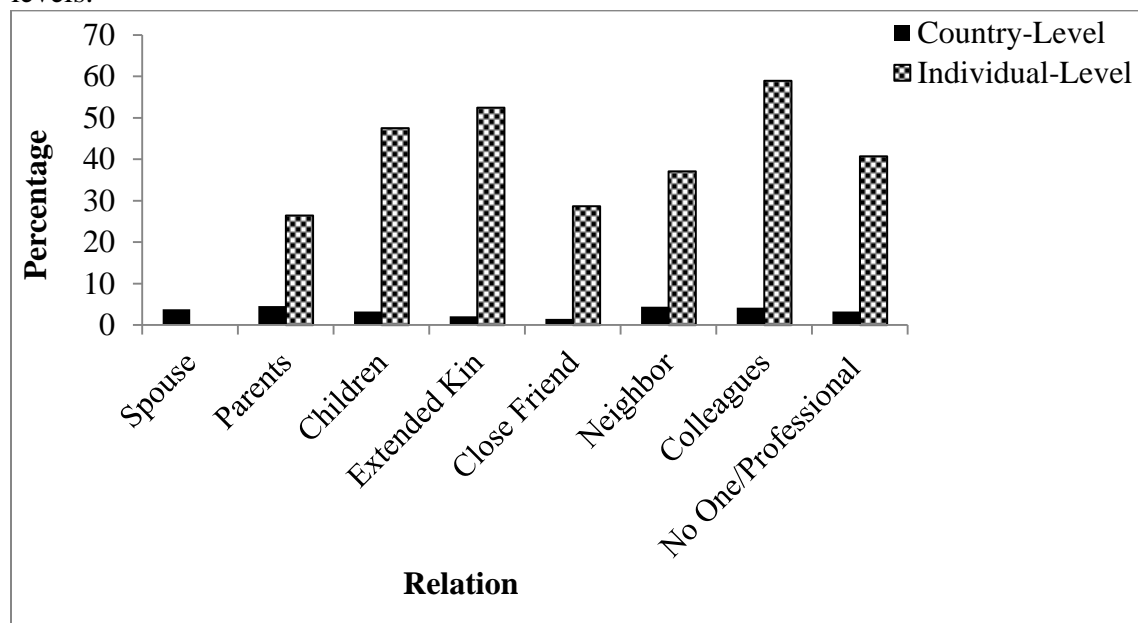


Figure 3-2: Effect of Sibship-Size on Network Composition (Kin)

Multilevel logistic regression models showing the effects sibship-size on whether or not respondents choose close-kin and extended-kin ties net of individual- and country-level control variables. Three or more siblings is the omitted category.

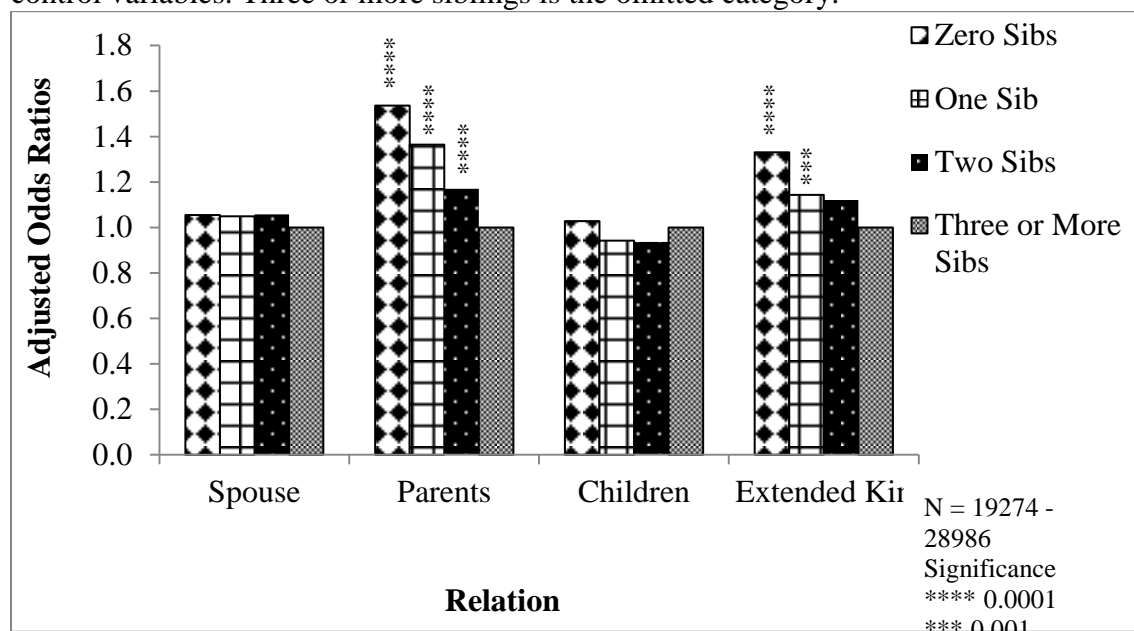


Figure 3-3: Effect of Sibship-Size on Network Composition (Non-Kin)

Multilevel logistic regression models showing the effects of sibship-size on whether or not respondents choose non-kin ties or choose no one/professional services net of individual- and country-level control variables. Three or more siblings is the omitted category.

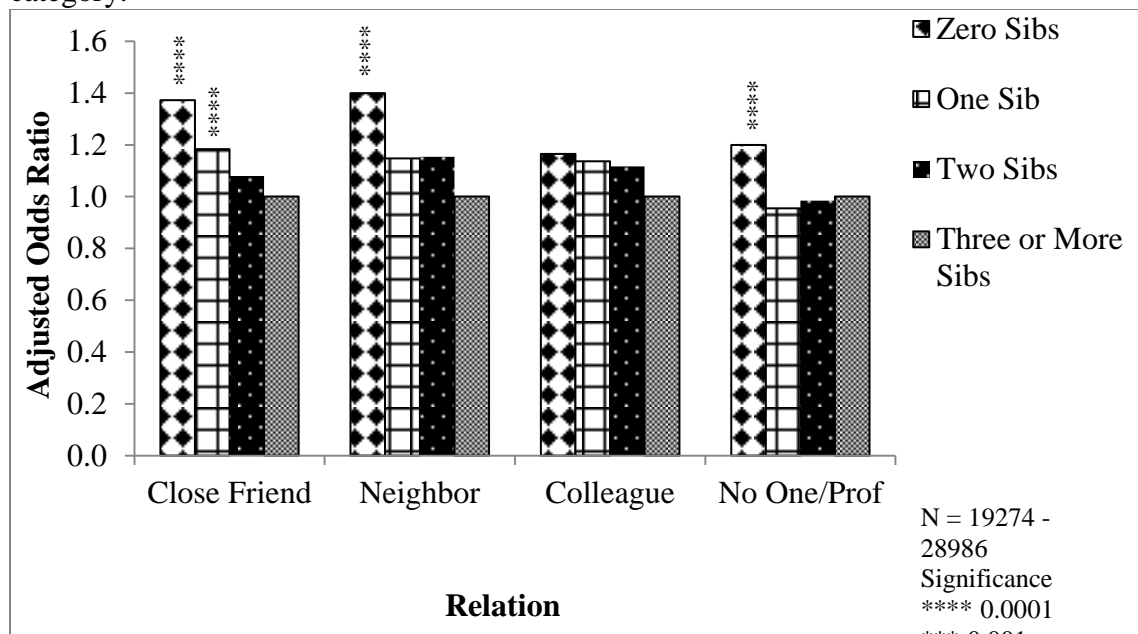


Figure 3-4: Content of Ties

Multilevel logistic regression models showing the tie-content of particular relations. First choice in illness is the omitted category.

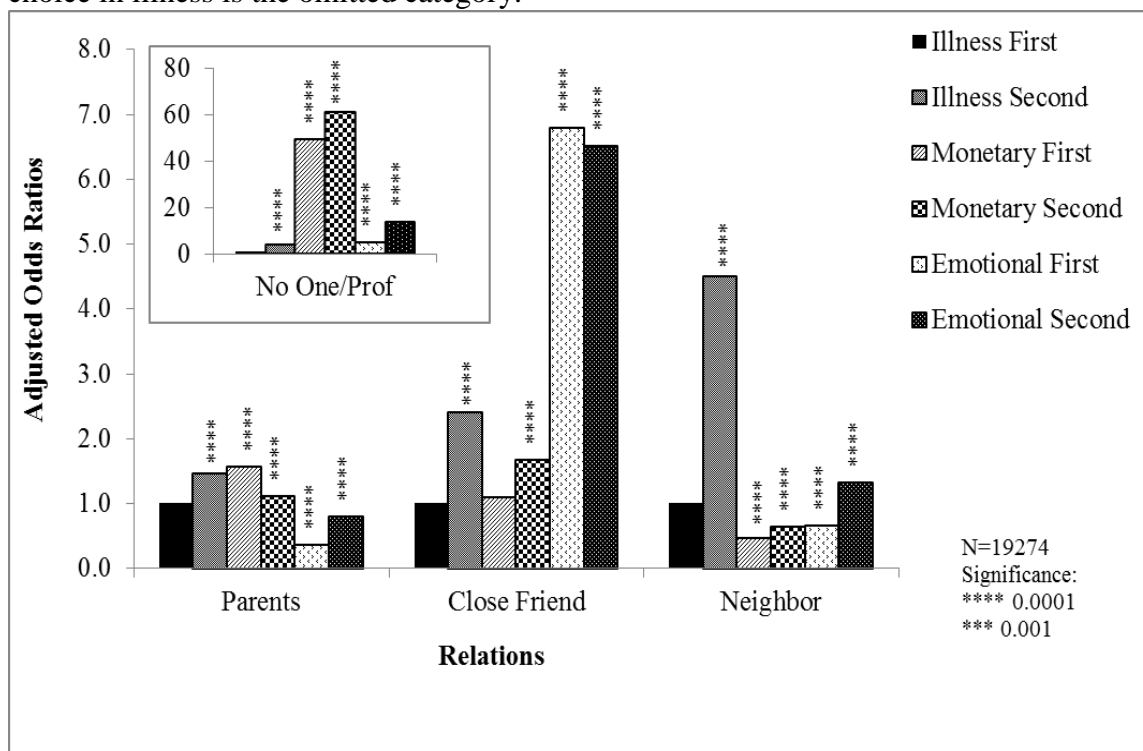


Figure 3-5: Effect of Sibship-Size and Tie-Content on Network Composition (Parents)
Multilevel logistic regression models showing the effects of sibship-size and tie-contents on whether or not respondents choose parents net of individual- and country-level control variables. Three or more siblings is the omitted category.

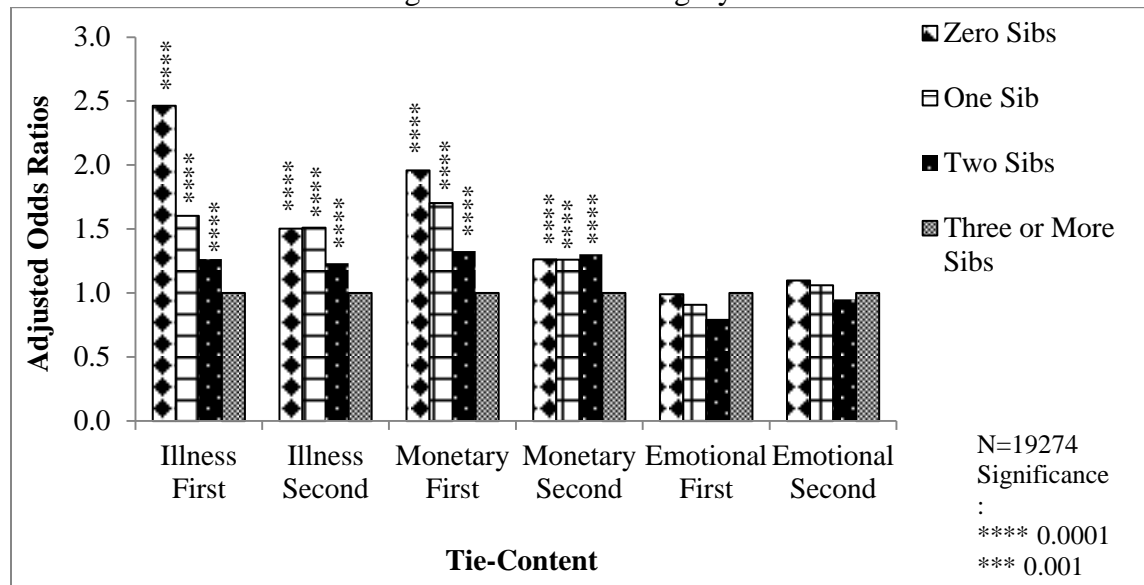


Figure 3-6: Effect of Sibship-Size and Tie-Content on Network Composition (Friends)

Multilevel logistic regression models showing the effects of sibship-size and tie-contents on whether or not respondents choose close friend net of individual- and country-level control variables. Three or more siblings is the omitted category.

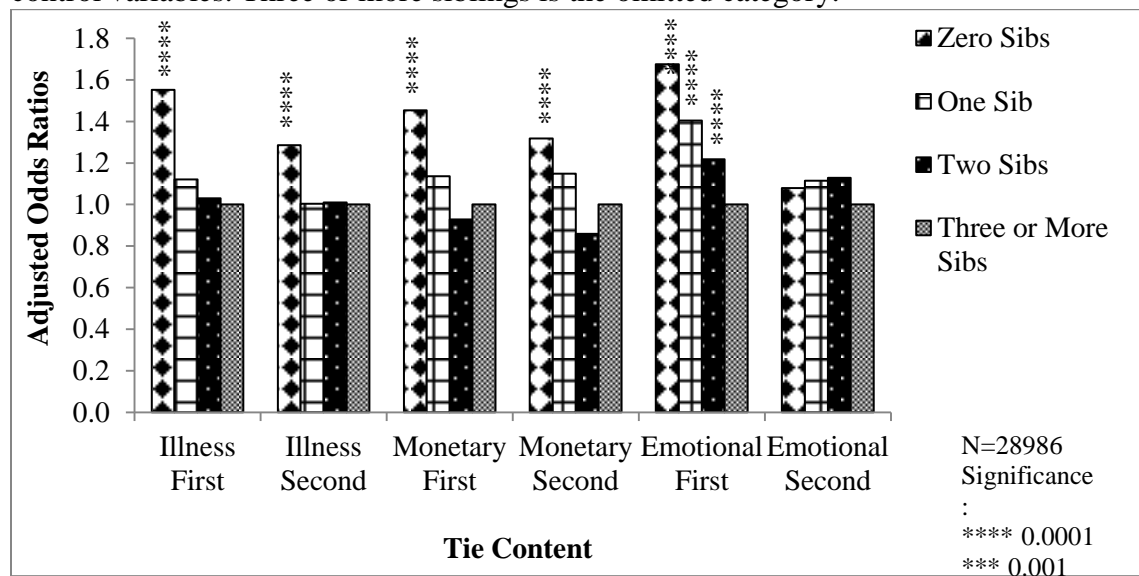


Figure 3-7: Effect of Sibship-Size and Tie-Content on Network Composition (Neighbors)
Multilevel logistic regression models showing the effects of sibship-size and tie-contents on whether or not respondents choose neighbors net of individual- and country-level control variables. Three or more siblings is the omitted category.

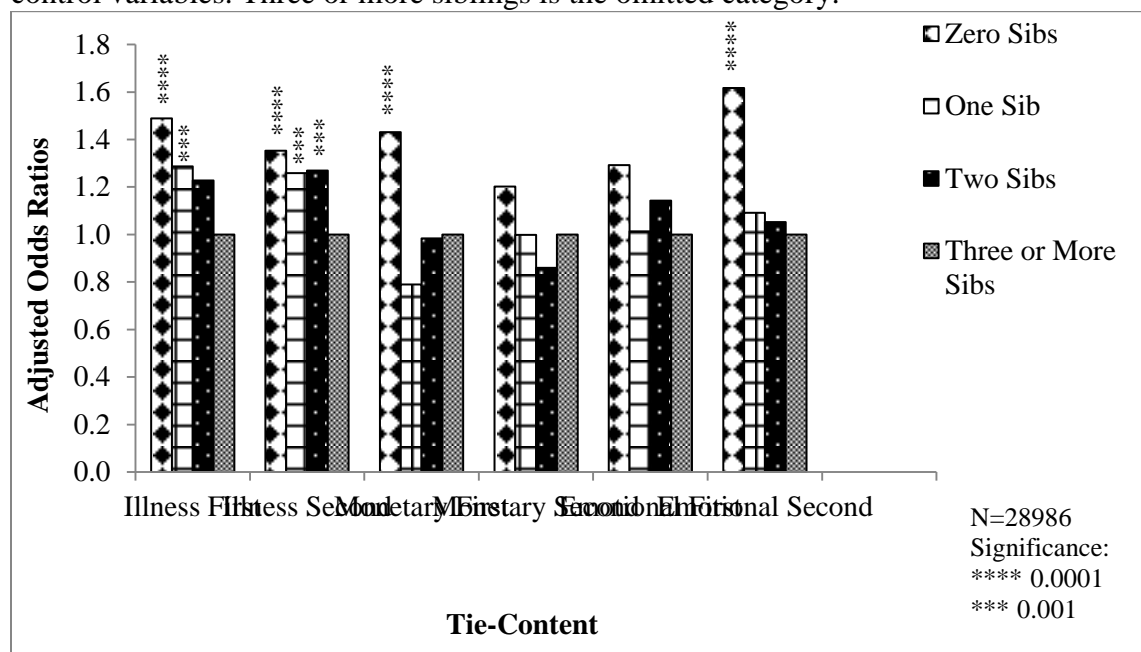
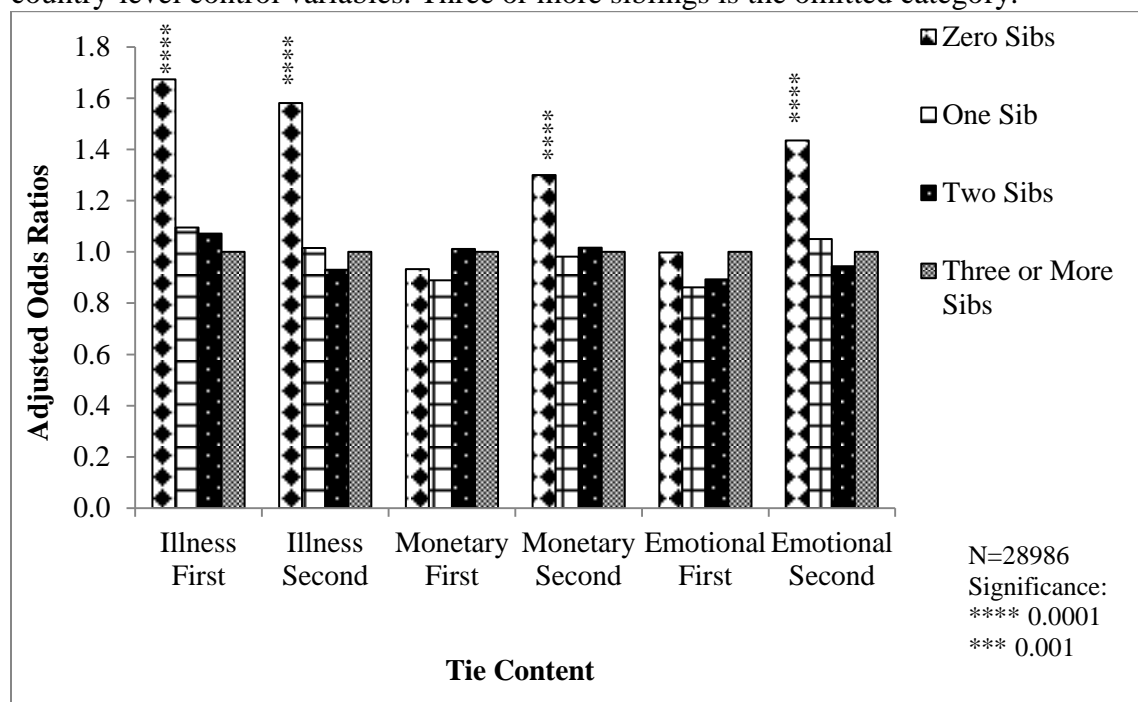


Figure 3-8: *Effect of Sibship-Size and Tie-Content on Network Composition (Isolation)*
 Multilevel logistic regression models showing the effects of sibship-size and tie-contents on whether or not respondents choose no one/professional services net of individual- and country-level control variables. Three or more siblings is the omitted category.



Chapter 4: The Local and Global Structure of Knowledge Production in an Emergent Research Field: An Exponential Random Graph Analysis

Abstract: In this chapter, I examine a third empirical example of a less-institutionalized situation posing intermediate levels of uncertainty. Previous research on established fields of knowledge production has found diffuse connectivity and/or clusters and the absence of centrality. In contrast, Exponential Random Graph models used in this article demonstrate that the uncertainty typical of an emerging area of research leads to the creation of a densely interconnecting core that coheres the network. At the same time, eclecticism and innovativeness, also characteristic of a developing area, lead to a diffusely connected structure linking together diverse regions and traditions of research. The results suggest that researchers publishing in the area respond to the uncertain environment by using tacit and discursive techniques. The data, comprising 2,200 authors and 76 papers have been manually coded from articles on the feminization of the labor force in Asia.

Introduction

Previous scholarship on knowledge networks has mostly been concerned with the discovery and interpretation of patterns at the level of the complete network in established areas of research. This approach has demonstrated that the structure of knowledge networks can be described in terms of diverse patterns, including clustering (Kaplan 1965; Small and Griffith 1974; Hill and Carley 1999; Daipha 2001), fragmentation (Carolan 2008), and structural cohesiveness (Moody 2004). Researchers have interpreted these patterns to signify the specialty, group, or organizational structure

of disciplines, changing scientific paradigms, academic stratification, and the diffusion of ideas. While systematic analyses have allowed us to ascertain macro-level properties of established research areas, there remain two gaps in the current literature: (1) inferences about the state(s) of research disciplines are mostly based upon the large-scale structural features of knowledge networks,¹⁶ and (2) much of our knowledge pertains to established areas of research.

To address this gap, in this final empirical example, I use recent advances in *Exponential Random Graph Modeling* (ERGM) to investigate the micro-processes underlying the creation of a knowledge network in an emerging research field. Researchers investigating an emerging research field face a greater degree of uncertainty attributable to the general unpredictability and lack of routinization in the field (Fuchs 1992) and low levels of consensus on what counts as scientific knowledge (Hill and Carley 1999). Evans (2005) argues that gatekeepers of knowledge production, such as editors and reviewers, are likewise unsure of standards of evaluation. At the same time, the existence of general publication standards and citable exemplars in the broader field mitigates some of the uncertainty characterizing the emerging area. This admixture of low routinization and consensus alongside canons of research suggests that emergent research fields can be treated as an example of a less-institutionalized situation imposing intermediate level of uncertainty upon researchers hoping to publish in the area.

¹⁶ The microprocesses responsible for their emergence, such as preferential attachment, closure, brokerage, and own-group preference, have largely been the subject of informed speculation (see, for example, Daipha 2001 p. 86-87; Moody and Light 2006 p. 83).

Rather than analyzing researchers' experience of uncertainty as in the garment workers' case, I operationalize the puzzle in terms of researchers cited in publications. Citations are intrinsically relational, connecting texts, authors or journals to other such units and represent an acknowledgement of the author's utilization of literature considered relevant to his or her contribution to the domain of knowledge. Given constraints on time and word limits, citations are thus equivalents of the interpretive work linking current uncertainties to stocks of personal as well as received schemas as discussed in Chapter 2.¹⁷ Moreover, such interpretive deliberation acquires greater significance in an emergent field characterized by low levels of consensus. Accordingly, the data for this study are derived from manually coding the bibliographies of seventy-six articles in a developing field of literature (published between 1997 and 2007) pertaining to the rise in the employment of women in Export Production Zones (EPZs) in South and East Asia. The data are recorded in two-mode format from citing papers to cited authors resulting in a network comprising 2,200 authors and 76 papers.¹⁸ Until recently, research based on two-mode data has relied upon analyzing their one-mode projections (see, Breiger 1974). While this technique is frequently valuable, the two- to one-mode conversion results in the loss of considerable information (Latapy, Magnien, and Vecchio 2008). Based on recent advances in the ERGM analysis of bipartite networks (Wang et al. 2009), I analyze the citation data in their original two-mode format.

¹⁷ Note, however, that unlike contrasting and analogizing, locating 'positive' and 'negative' citations links is a much more tenuous task. Consequently, I have only tabulated all citations without any reference to the analogizing or contrasting nature of that reference.

¹⁸ It is important to note that while I cannot guarantee that every paper written in this area is included in the dataset, I have made every effort to meet that target. Thus, the relative smallness of the dataset in comparison to some other studies is largely attributable to the emergent nature of the field.

Following current research, I examine three macro-level properties of the citation network. That is, I investigate the extent to which it manifests a star or core-periphery structure, structural cohesiveness, and/or the properties of a small-world. I next investigate the microprocesses that are most likely to have generated the macro structure. Briefly, at the macro level, I find that the data reveal a core of highly cited authors that contributes significantly towards the connectivity of the network. In addition, I also find evidence in support of structural cohesion and small-world patterns. ERGM reveals that microprocesses jointly interpretable as *preferential attachment*, *homophily*, and *differentiation* are responsible for generating the network. In emphasizing preferential attachment and corresponding tendencies towards centralization of the network, the findings from this study diverge from those of previous research that has found fragmentation or cohesion to exist alongside the *absence* of centrality (see, Daipha 2001; Moody 2004; Carolan 2008). I argue that the social forces structuring a less-institutionalized field of research in its early years are somewhat different from those affecting an established field. Citing a small stock of influential authors, a practice according the network with a heavy center of gravity, is more crucial for authors hoping to publish in an emergent field. Simultaneously, consistent with previous arguments (Gilbert 1977; Paisley 1990; Hill and Carley 1999), the findings on differentiation suggest that scholars publishing in an emergent area, the boundaries of which are as yet uncertain, are likely to be both innovative and influenced by eclectic sources.

Global, Dyadic, and Local Properties of Knowledge Networks

Data Construction

Research focused upon the structure of knowledge production frequently relies on network data. The nodes in the network may be researchers, documents, concepts, or organizations. The edges connecting these nodes correspondingly are collaborative authorship (Babchuk, Bruce and George 1999; Moody 2004; Goyal, van der Leij and Moraga-Gonzalez 2006), social and intellectual contacts between scientists (Lievrouw et al. 1987), co-occurrence of references in the bibliographies of other documents or co-citation (Small and Griffith 1974; Moody and Light 2006), shared citations of the same other documents or authors also known as bibliographic coupling (Kessler 1962), shared membership in organizations (Barnett and Danowski 1992; Cappell and Guterbock 1992; Daipha 2001), or conceptual similarity between documents (Small 1978; Lievrouw et al. 1987, Hill and Carley 1999). The analysis of such networks constructed from citation indices, organizational memberships, and authorships is largely conducted at two levels. At the dyadic level, researchers have been concerned with the meaning attributed to the edges interlinking the nodes. At the ‘global’ or ‘macro’ level, researchers analyze the topological properties of the network as a whole providing a bird’s-eye description of the research field. There is yet another level – the ‘local’ or ‘micro’ level – involving more than one tie but significantly less than the complete network which remains relatively underanalyzed in the literature. I briefly describe these three levels next.

Dyadic Properties

Considerable debate surrounds the meaning of the ties linking any two nodes. That is, what exactly is it that flows through the pipes linking individuals, organizations, or documents? Citations, for instance, have variously been interpreted as indicative of social influence, reputation, political motivations, self-aggrandizement, property rights, symbol-making activity, intellectual heritage, ‘window-dressing’, and intellectual debt relations between authors (Kaplan 1965; de Solla Price 1965; Small and Griffith 1974; Gilbert 1977; Small 1978; Cozzens 1989; Leydesdorff and Amsterdamska 1990; Kostoff 1998; Makino 1998; Fujigaki 1998; Kostoff 1998; Collins, 2001; Jarneving 2005). Similarly, co-specialization has been argued to be represented by organizational memberships (Cappell and Guterbock 1992; Daipha 2001) on the one hand and declared areas of interest (Ennis 1992) on the other.

Meanings of ties are highly contested areas of research because they have implications for the meanings attributed to the network under study. Assuming citations symbolize ideational connections between documents implies that the network represents the intellectual structure of a research field. On the other hand, a network made up of citations viewed as links between authors is thought to reflect the social organization of scientific communities (Leydesdorff and Amsterdamska 1990).

Global Properties

A significant proportion of the research investigating knowledge networks is dedicated to the detection and analysis of macro-level structure. Using clustering algorithms such as the level of the strength of co-citation between documents, Small and

Griffith (1974), for instance, investigate the specialty structure of scientific disciplines. Others have likewise used alternative techniques such as hierarchical clustering and multi-dimensional scaling to decipher the intellectual and social structure of a discipline (Daipha 2001), similarity indices to map the position of one discipline relative the position of others (Moody and Light 2006), and factor analysis to discover sub-specialties within a discipline (van den Besselaar 2001). Another variant of global-level analysis is concerned with analyzing the importance of particular documents, concepts, or authors on the basis of their position in the complete network (Hoffman and Holbrook 1993; Otte and Rousseau 2002; Evans 2005).

Substantively, this research delineates a number of hypotheses linking global network properties to the research structure of disciplines. Moody (2004) discusses three distinct models to describe a co-authorship network in sociology. A *star* network structure exists when a small number of authors are on the receiving end of a large number of credits. Such ‘stars’ are expected to exert disproportionate influence in the research community as their ideas diffuse more rapidly through the network. A *small-world* network structure is made up of locally dense clusters (such that one’s connections are also tied to one another) that are nevertheless linked by few interconnecting paths of relatively short length. This structure is likely to be associated with a theoretically fractured underlying knowledge space. A *structurally cohesive* network, with evenly distributed ties and numerous paths connecting any two nodes, would be characteristic of a space with cross-topic collaborations and permeable boundaries. Carolan (2008) discusses three comparable models applicable to research in the field of education: the ‘plural-world’ model made up of sub-disciplinary fragments that impede consensus

formation; Moody's structurally-cohesive model with substantial inter-connectivity between sub-disciplines; and the small-world model. Moody finds that while the network contains influential people, as connectivity is not contingent upon them, the star model is an inappropriate description of the data. Likewise, he rejects the fit of the small-world model, arguing that "high levels of intergroup contact, weak internal structure, and strong overall connectivity point towards generalized cohesion" (p. 231). Daipha (2001) similarly argues for the lack of centrality in sociology. But instead of cohesion, she argues in favor of an environment marked by pluralism and segregation. In between these two sets of findings, Carolan finds the education research field to be a mix of small-world and structural cohesion features.

These findings, however, largely pertain to mature areas of research. An investigation of emergent fields paints a rather different structural story. According to Crane (1988[1972], p. 40, 54), during the early stages of an area of research, a few productive scholars become crucial for the development and overall connectivity of different parts of the field. Substantiating this argument, Moody and Light (2006) find that the discipline of sociology to be comparatively more centralized in 1970 than in 1980. Hill and Carley (1999) similarly find that the early years of a discipline are associated with greater (conceptually measured) structural centrality. Evans (2005) argues that this higher tendency toward centralization in the early years can also be explained on the basis of a need for legitimation. In the early years, Evans argues, when gatekeepers of publication are not sure of how to evaluate a text, they rely on the prestige of a small number of key predecessors. Analogously, 'task uncertainty' or the "extent to which scientific production is (not) routinized and predictable," can be expected to be

higher when problems and concepts are not clearly defined (Fuchs 1992:82, 190) leading scholars to be reliant on exemplars. As distinct from previous arguments about the lack of centrality, these studies suggest that in the early years, an area of research characterized by low consensus, high uncertainty, and centralized influence may lead to the creation of a star-like structure of knowledge space.

The Missing Link: Local Properties

While the existing literature makes important contributions to the global structure of knowledge networks as well as to dyadic-level meanings, analyses that account for the frequency with which network structures involving more than one tie but significantly fewer ties than the complete network occur are largely missing. Such micro-structures are network configurations composed of a few ties, such as, triads or four-cycles. For example, in a network composed of authors citing documents, a four-cycle could be composed as follows: Author A cites documents T1 and T2, both of which are also cited by author B. Larger configurations of this type could involve nested four-cycles involving the same two documents being cited by multiple other authors or the same authors citing many of the same other documents.

These configurations, however, are not merely structures, but indicators of *social processes* that influence actors' involvement in knowledge networks. That is, similar to interpretations of structural properties at the global (for example, fragmentation implies sub-specialties) and dyadic (meanings of citations) levels, micro network configurations have associated (context-specific) substantive meanings. Consequently, they are also known as *localized attachment logics* (LALs) in ERGM literature. For instance, a star

structure at the micro level may plausibly be thought to reflect preferential attachment (a social process), whereby nodes entering a new field attach themselves to popular nodes either because of the latter's inescapable influence (Crane 1988) or for purposes of legitimation (Evans 2005).

The statistical modeling of networks within the ERGM framework helps to link such local configuration with global structural outcomes. This is achieved by examining the degree to which tendencies towards or against the formation of micro-configurations contribute towards the emergence of the overall network structure. A model obtained by applying ERGM may reveal, for instance, that a general propensity in a literature towards the formation of four-cycles of the type described above leads to structural cohesion with many paths linking authors at the global level. Similarly, a core-periphery structure may be obtained from the concatenation of many local star structures (Snijders et al. 2006). While several authors have speculated upon such local processes as the formation of 'exemplars' (Gilbert 1977; Evans 2005) to explain a core-periphery structure; competition, own-group preference, and ideological schisms (Small and Griffith 1974; Egghe and Rousseau 2004; Daipha 2001; Moody 2004; Moody and Light 2006) to explain structural pluralism; and cross-topic-collaboration and brokerage (Moody 2004) to explain structural cohesion at the global level, little has been done in the way of examining this micro-macro link in a statistically rigorous way. Using recent advances in ERGM, I explicitly investigate the LALs responsible for the creation of the citation network of an emergent field of literature.

Stated simply, the application of ERGM proceeds by examining the global properties of a network; speculating upon the micro-structures generative of that

structure; and finally specifying a model composed of the configurations thought to be suitable. Interpretation of the models so obtained is the final step. The following analysis is organized in accordance with this schema. First, based on current literature, I test if the global properties of the network fit a star, small-world, or structurally cohesive pattern. Next, on the basis of that evidence, I use ERGM to investigate the underlying microprocesses leading to the emergence of those global properties.

The Data: The Emergent Literature on EPZs

Data for this paper are derived from the bibliographies of seventy-six articles. The coding was done in two-mode format from text to author. This was achieved by tabulating the reference lists of the seventy-six papers in digital forms recognizable by *Pajek*, a network visualization software package and *BPNET*, a network statistical modeling software package. An edge in this network connects a paper to an author if that author's name is found in the bibliography of that paper. There is thus a duality between authors and texts. Authors are indirectly connected to each other by virtue of being cited by the same papers, while the papers are similarly interconnected by the authors they cite in common. The data in their two-mode format can be converted to unipartite form by using either one of Breiger's (1974) algorithms to derive one-mode projections from two-mode matrices. However, rather than converting the data to one-mode as has been done by others (Daipha 2001; Carolan 2008), consistent with recent advances in the analysis of bipartite network data (Latapy, Magnien, and Vecchio 2008; Wang et al. 2009), they were analyzed in their original two-mode form, preserving the duality between authors and documents.

The articles, written in the English language, pertain to the employment of women in Export Processing Zones (EPZs) in Asia. The four nations of Bangladesh, Sri Lanka, China, and India began implementing reforms aimed at the privatization and liberalization of the economy in 1975, 1977, 1978, and 1991 respectively. As a part of the liberalization process, international companies producing mostly consumer goods were given incentives by domestic governments to set up factories in demarcated regions called EPZs. It has been demonstrated that factories in EPZs frequently employ a larger proportion of women, a phenomenon termed as the ‘feminization’ of the labor market (Hale 1996; Standing 1999; Kabeer 2004; Datta 2005). Feminist literature examining the consequences of structural adjustment policies has tried to assess their gender-differentiated implications, explicitly questioning the alleged gender neutrality of market-oriented policies. This literature stands in stark contrast to traditional economic models that explain sex-based discrimination as ‘residual variance’ rather than viewing markets as structurally gendered (Elson 1999). Feminist writers have offered a number of critiques to this traditional rational choice model of agency, arguing that this type of employment is severely exploitative (Safa 1981), places an unequal burden on women (Berik, Dong, and Summerfield 2007), and does not automatically translate into empowerment in the long run (Tzannatos 1999; Ghosh 2002). Despite the criticism registered against economistic measures of empowerment, it is nevertheless argued that women in this space should be viewed as agents of change renegotiating gender and work relations in their everyday actions.

These papers, whose publication dates range from 1997 to 2007, were identified on the basis of keyword searches including, but not limited to, globalization, EPZ,

garment, Asia, feminization, India, China, Sri Lanka, and Bangladesh, on search engines including Google Scholar, EBSCO Host, University Libraries, Searchlight, and JSTOR. The search was conducted until no new papers related to the subject matter of the feminization of the labor force in Asia could be found. The papers so identified were then read to ensure that they were indeed related to the subject matter of EPZs and feminization. The papers were subsequently classified on the basis of the specific region within Asia upon which they focused. This process resulted in the delineation of six regions (number of papers): Asia (8), Bangladesh (21), China (12), India (16), South Asia (4), and Sri Lanka (15).¹⁹

The resulting dataset comprises 2,220 authors and 76 papers. As the data were coded manually, rather than from citation indices, the effect of errors from spelling or the inclusion of middle names is likely to be lower. Moreover, after the coding, the data were reorganized by cited author and checked for the occurrence of such errors. Of the total authors, 1,658 are cited only once. They fail to link any papers together and hence may be regarded as unimportant for the purposes of general pattern detection. The exclusion of all authors cited once reduces the original set of 2,220 authors to 562, resulting in the ‘multi-cited’ network.

¹⁹ To the extent possible, the papers were classified into the four nation specifications. However, some papers did not fit neatly into this classification, yet they addressed issues relevant to feminization in Asia. Those papers were classified as pertaining to Asia in general, or more specifically to South Asia.

Analysis

Global Properties of the Network

Star Structure

[Figure 4-1 (about here)]

Figure 4-1 depicts the indegree distribution of the network. As can be seen from the left panel, the distribution has a long tail, indicating that whereas most authors are cited a few times, some authors or ‘stars’ are cited repeatedly in the network. The same information is reflected on a logarithmic scale in the right panel. The negative slope of the natural \log^{20} of frequency to the natural log of indegree is a property of ‘scale-free’ or ‘power-law’ networks (Barabási and Albert 1999).²¹ This star structure of the data is also evident from the fact that the network of papers is robust to the removal of lower indegree authors from the network. To begin with, the network is a single component (Wasserman and Faust 1994), such that every paper is reachable from every other, via their mutual connections to cited authors and vice versa. Not only is the network a single component, but it continues to remain so when authors receiving fewer citations are eliminated from the network. In fact, the network remains completely connected until the sixth iteration of the sequential exclusion of the lowest indegree authors. Once all authors receiving *fewer* than seven citations are removed, two papers break-off, becoming

²⁰ An OLS regression fitting the log of frequency on the log of the outdegree results in a negative slope of -.45 with an R-square of .92.

²¹ In social network literature, distributions with long tails that do not exhibit a representative observation are called scale-free. It should be noted however, that as the data do not display a strict power law structure (the slope of the curve is quite low), this model may not be sufficient to capture the structural properties of the data.

isolates in the network. Further iterations reveal a very slow rate of paper isolation. The ninth iteration, eliminating all authors receiving fewer than ten citations, results in the loss of ten papers from the entire network leaving twenty-five authors, each on the receiving end of ten or more citations that interconnect sixty-six of the seventy-six papers. A mere 1.12 percent of the original set of 2,220 cited authors keeps 87 percent of the papers interconnected.²²

Cohesiveness

In addition to the robustness of the network to the removal of less popular authors, the multi-cited network is also a bicomponent. Moody and White (2003) argue that bicomponents (components in which there are at least two node-independent paths connecting every pair of actors) are more robust than components because the network is less sensitive to becoming disconnected even if some nodes are eliminated. Moody argues this to be a feature of the structural cohesion model. In fact, reversing the node removal procedure described above, the exclusion from the network of the set of twenty-five authors receiving ten or *more* citations, leaves the entire set of seventy-six papers interconnected by virtue of citing the less frequently cited authors. Continued iterations reveal that all seventy-six papers remain connected to the network until the final iteration of removing all authors receiving more than two citations. At this point, three papers drop out of the network, leaving seventy-three of the original seventy-six papers indirectly connected to one another. This is quite a remarkable level of connectedness. The continued removal of highly cited authors could ultimately have resulted in a

²² This star structure of the data is also confirmed by the Gini coefficient (0.408) of the continuous coreness scores of the author-by-author valued matrix (see Borgatti and Everett 1999).

fragmentation of the network into many components. That this did not occur implies that papers are not attached to the network solely by virtue of citing the more popular authors. Less prominent authors in the network also serve to interconnect the papers, lending support to the structural cohesion model. However, as the core of merely twenty-five authors in the center of the network maintains the interconnectivity of most of the papers, it correspondingly has a lower diameter and average distance than the periphery. The diameter of the connected portion of the core is 6 and the average distance is 2.71. The corresponding figures are 7 and 3.95 for the non-core (authors with an indegree of 9 or less and the papers connected to them) and rise to 14 and 5.85 for authors receiving two citations each.

Regions as Small-worlds

[Table 4-1 (about here)]

Table 4-1 shows some descriptive features of the whole network as well its constituent regional parts. In this network, the density is lowest when the entire network is considered but doubles for the multi-cited network. The density of all the regional components is considerably higher than that of the complete and the multi-cited networks. The average distance is similarly smaller for all the regional components. The higher density and shorter distances within the regional components clearly suggest internal clustering.

[Table 4-2 (about here)]

Regional patterns in citations become all the more evident on an examination of each author's citation profile cross-tabulated by region. Faulkner (1983) discusses the

‘typecasting’ of music composers by genre of Hollywood films. In a similar manner, certain authors are more likely to be cited within literature originating in a specific region. In order to test this at the global level, each author’s citations were tabulated by the region of the sending paper. The overall patterns (Table 4-2) in the author by region citations indicate significant, but low, negative correlations between the four countries (with the exception of Bangladesh and China). This pattern demonstrates that, in general, there is a tendency for low overlap between regional citation profiles, corroborating earlier evidence in support of region-based cohesion.

At a more local level, the typecasting of authors is also evident from variations in their region-based citation profiles. Authors with high variance are more likely to be cited in only one region to the exclusion of other regions whereas authors with low variance are more likely to be on the receiving end of citations from literature on all regions. Kabeer, the most cited author in this network, receives most of her citations (sixty-three percent) from Bangladeshi papers, considerably skewing her citation profile. Similarly, Zohir, Kibria, Paul-Majumdar and Jahan receive most of their citations from Bangladeshi papers, Jacka, Lee and Pun from Chinese papers, Banerjee and Jhabvala from Indian papers, and Jayaweera, De Alwis, Lynch and Hewamanne from Sri Lankan papers.

[Table 4-3 (about here)]

Despite this evidence in favor of regional concentration, the clusters do not amount exactly to small-worlds. In contrast to authors with high region-based variance, others, such as Pearson, Elson, Beneria, Ong, Wolf, and Joekes, mostly writing about feminization in other geographical contexts, have much more even citation profiles,

making them more central to the genre as a whole. These and other authors create multiple passageways deeply interlinking regional clusters, much like Crane's (1988) community of core researchers – the invisible college – that binds disparate groups within a research area. Table 4-3 shows the absolute number of linkages connecting the four country clusters at distinct levels of author indegree. For instance, accounting for authors who are cited only twice (indegree of 2), Bangladesh papers are mutually connected to China papers via two citations, to India via eighteen, and to Sri Lanka via five. It is apparent from the table that the clusters are strongly interlinked. But it is also clear that periphery authors contribute significantly less towards fusing regional clusters than do more popular ones. In the aggregate, even though there are 537 authors with an indegree of 9 or less (excluding singly cited authors), they are a source of far *fewer* interconnections between regions than the 25 authors who have an indegree of 10 or more.

[Figure 4-2 (about here)]

These properties of the network can be confirmed from Figure 4-2. Figure 4-2, drawn using the Fruchterman-Reingold²³ algorithm depicts the complete network as well as the multi-cited component. The left panel shows that the skewed degree distribution manifests in a core-periphery structure. The author nodes towards the center of the figure receive most of the citations, while the nodes towards the periphery and semi-periphery are the source of connections between fewer papers. The figure also shows that the entire network is single cohesive component. The comparatively higher region-specific

²³ The Fruchterman-Reingold algorithm is a force-directed algorithm. Essentially, it draws a layout by pulling adjacent vertices together and pushing non-adjacent ones apart until a local minimum force is reached.

interactions can be seen from the right panel of this figure. It shows the Bangladesh, China and Sri Lanka papers to be clustered together in the northwest, southeast and southwest of the figure respectively. Asia, India and South Asia, although not as tightly visually clustered as the other three, are nonetheless still found towards the middle and northeast of the picture. The spatial centrality of the Asia and South Asia components is quite remarkable because it indicates that their relationally derived position is supported by their lack of nation-specific, attribute-based categorization.

To summarize, in line with the findings on emergent areas of research, the data reveal a core of highly cited authors that contributes significantly towards overall as well as regional paper interconnectivity and considerably lowers the average distance and diameter of the network. While the stars may not hold the network together in a strictly structural sense, they are nonetheless very important for *cohering* it, and in that latter sense, emergent research on EPZs in Asia appears to be highly dependent upon them. In addition, consistent with previous research on mature areas of research, the deep interconnectivity of the overall network well into the periphery and higher intra-regional connections point towards structural cohesion and pluralistic small-worlds respectively. In the next section, I use exponential random graph modeling to investigate the micro-configurations and associated localized attachment logics that are most likely to have generated these global properties.

Exponential Random Graph Modeling

Modeling Framework

The ERGM framework assumes a stochastic environment in which ties/edges serve as random variables. Modeling begins with dependence assumptions such as Bernoulli, Markov or realization dependence (Pattison and Robins 2002; Snijders et al. 2006; Robins et al. 2007a and 2007b) based on the Hammersley-Clifford theorem (Besag 1974). Dependence assumptions are hypotheses about how ties in the network are expected to be interconnected. For example, a Bernoulli model postulates that all ties are independent of one another and the occurrence of higher order configurations in the data, such as triads, are attributable to chance. In such a case, it would be safe to assume that the aggregate pattern is simply an agglomeration of individual ties, and larger micro-configurations are unimportant. In addition to endogenous network configurations, a model may also include exogenous attribute variables to capture homophily/heterophily effects. The Hammersley-Clifford theorem helps to impose homogeneity across subsets of ties that are isomorphic to each other, making the model estimable. Until recently, most estimation was done using either Maximum Likelihood Estimation (MLE) (Holland and Leinhardt 1981) or Maximum Pseudolikelihood Estimation (MPLE) (Strauss and Ikeda 1990). More recently, Monte Carlo Markov Chain Maximum Likelihood Estimation (MCMCMLE) (Snijders 2002; Handcock 2003; Hunter 2007) has become the preferred fitting algorithm. While most literature on ERGM pertains to one-mode data (Pattison and Robins 2002; Snijders 2002; Robins et al 2009), foundational work by Skvoretz and Faust (1999), and Agneessens, Roose and Waege (2004) has recently been

extended and implemented by Wang et al. (2009) to include two-mode data. The latter modeling strategy has been applied in this article.²⁴

Model

[Table 4-4: ERGM Fit (about here)]

The global properties of the network enumerated above are modeled here using the MCMCMLE algorithm. Several models with various combinations of network configurations were tested on the data. The best results of fitting a model to the multi-cited network are shown in table 4-4, while a few other model fits and goodness of fit statistics can be found in Appendix 4-1. Ties represented in the table connect circles (authors) and squares (papers), with regions represented in distinct shapes. The model shown here fits endogenous *edge*, *alternating-paper-k-star*, *alternating-author-k-star*, *alternating-paper-k-two-path* and exogenous *country-wise homophily* locally specified parameters to the data.²⁵ This model performs much better than the Bernoulli model which assumes ties to be independent of each other, demonstrating that the other network configurations listed here are important determinants of the aggregate structure.

The first column of Table 4-4 graphically depicts the network configurations employed in the model. The first edge parameter simply accounts for the number of ties in the model. The alternating-author-k-star parameter captures the effect of multiple papers citing the same author, while the alternating-paper-k-star conversely captures the

²⁴ A comprehensive review of the literature in this area is not possible here. Interested readers are encouraged to consult Robins et al. (2007) for a good introduction to the material.

²⁵ In the model fit, Asia, South Asia and India have not been presented because they did not exhibit converging estimates of homophily.

effect of multiple citations by the same paper. Kabeer, for instance, the most frequently cited author, receives citations from twenty-nine of the seventy-six papers making her an ‘author 29-star’. On the other extreme, all authors on the receiving end of two citations are author 2-stars. The alternating-paper-k-two-path explains the tendency for two papers to cite the same multiple other authors, or the strength of bibliographic coupling (from the viewpoint of the papers). For example, the citation of five of the same authors by two papers would create a paper 5-two-path between them. In fact, the data show that ninety-five pairs of papers share exactly five author citations. Finally, the homophily parameters capture the tendency for papers within the same regions to cite the same authors. A negative parameter estimate indicates low probability, while a positive estimate indicates high probability. Parameter estimates are considered significant if the reported standard error is less than half the corresponding parameter estimate.

The interpretation of the negative edge parameter is similar to the intercept in standard regression analysis. The high positive paper k-star estimate captures the tendency of papers to cite multiple authors – hardly a surprising finding from what we know about article bibliographies. The positive author k-star parameter estimate, on the other hand, signifies a tendency for authors to be on the receiving end of citations from multiple papers. Net of other structural effects, a positive k-star parameter alongside a negative edge parameter has been interpreted to reflect *preferential attachment* at the local level leading to a *core-periphery* structure at the global level (Robins et al. 2007b and 2009).

The negative paper k-two path parameter indicates that there is not a very strong tendency towards high bibliographic coupling, so two papers do not tend to cite many of

the same authors. The positive k-star estimates and the negative k-two path estimate in conjunction imply that while papers tend to cite some of the same authors (preferential attachment towards authors in the core), this tendency is limited in its scope for closure. This implies that, despite or in addition to preferential attachment towards the core, citation profiles do not simply converge on a single set of star predecessors. They actually tend to vary from one paper to the next. This indicates some degree of *differentiation* built into individuals' selection of citations, and/or processes or norms endemic to the field that invite limitations on the convergence normally associated with preferential attachment. Finally, the positive homophily (McPherson, Smith-Lovin, and Cook 2001) estimates suggest that papers of the same region tend to cite the same authors, leading to regional grouping at the global level.²⁶

Discussion and Conclusion

It is important to emphasize that this analysis pertains to a single area of emergent literature, and consequently generalizability to other cases should be interpreted with caution. Nevertheless, if the analysis has external validity, what could we learn from it?

At the aggregate level, the descriptive network analysis demonstrates that the data exhibit features of all three paradigmatic models of knowledge production discussed in previous research. The set of twenty-five authors with high degree centrality are collectively a crucial source of interconnectivity, conforming to the star model. At the

²⁶ In addition to the multi-cited data, I also ran models on the complete dataset including single citations. It is important to bear in mind that on the basis of current technology, the time costs of fitting ERGM to very large datasets are prohibitively large. In fact, large fitting ERGM to very large datasets is often intractable. Initial runs on the complete dataset revealed that models similar to the one above (with higher star parameter values and lower two-path effects) were suitable for the complete dataset, as well.

same time, the comparatively higher internal density and external negative correlations of the regional components are indicative of small-world like properties. Lastly, the continued connectedness of the papers despite the removal of high indegree authors, as well as it being a bicomponent, accords well with a structural cohesiveness argument.

Exponential random graph modeling reveals that three sets of structural configurations – the presence of star structures and regional homophily, and the absence of paper-two-paths - are responsible for inducing the global network structure. While the first two of these local configurations seem to be consistent with the global core-periphery and small-world structures respectively, the absence of two-paths appears to be at odds with a cohesive structure. Recall that a cohesive structure requires a relatively even distribution of ties and many paths linking nodes together. The positive star parameters and regional homophily defy the first requirement, while the negative paper k-two-path parameter challenges the validity of the second. Clearly, there is a discrepancy between the structural properties of the network in its aggregate form and those operating at the micro level. In what follows, I first offer substantive interpretations of the three local configurations generally, as well as in the context of emergent literature on EPZs. Next, I link the micro- and macro-level analyses in light of those substantive interpretations.

A tendency towards the formation of author-stars can be interpreted simply: scholars are more likely to cite reputable authors that are visibly also being cited by other scholars, a process termed preferential attachment in network literature. Yet, preferential attachment need not be operative uniformly over the life-course of an area of research. In the early years, when a literature is marked by low consensus (Hill and

Carley 1999) and high task uncertainty (Fuchs 1992), authors with lower prestige have a greater motivation to cite more reputable ones in order to legitimate their own work (Evans 2005) thereby accelerating preferential attachment tendencies. This strategy serves the dual purpose of signaling as well as drawing substantive or ideational links. Furthermore, Evans (2007) argues that low consensus is associated with high rates of publication rejection, which creates yet another basis for uncertainty, further driving up the need for legitimation. Fuchs also argues that task uncertainty is expected to be higher in the event of disintegrating paradigms. Furthermore, Whitley (1984) points out that uncertainty is positively related to audience plurality. Given that literature on feminization in Asia is an emergent area of research, that it has arisen largely in response to changing state policies and in opposition to rooted economic models of labor and globalization, and that it is considerably politically charged with appeal to diverse audiences, it should be characterized by high task uncertainty and consequently greater need for legitimation.

Another possible explanation for the emergence of star structures is that certain authors have been around longer. That is, preferential attachment effects could be due to time in the discipline rather than reputation. Without explicitly controlling for tenure, it is nearly impossible to distinguish between these two effects in a static analysis. Nevertheless, the difference between ‘pure’ reputation and temporal effects is likely to be much more fluid in the case of emergent literatures. This is because, as Crane (1988) argues, early researchers are also the innovators setting the research agenda well as training and recruiting students. These early developers are highly influential, both socially and intellectually. Consequently, as the evidence suggests here, most papers

publishing in this area cite this small pool of pioneering scholars almost as a matter of necessity.

Positive propensities towards regional homophily configurations imply papers within the same regions are more likely to cite many of the same authors. On the one hand, this is indicative of differentiation away from the general subject matter and towards the specifics of the case. In this instance, authors aim to produce findings that speak not just to the subject matter of feminization of the labor force in general, but also to its regional particularities. This tendency to attend to specifics produces configurations of the regional homophily type. On the other hand, regional homophily may also obtain from the very processes that lead to preferential attachment to core authors. Successfully publishing in area-specific journals may require citing local luminaries, who may well also have considerable social and intellectual influence.

Lastly, the alternating-paper-k-two-path configuration measures the extent to which papers cite the same authors. ERGM reveals that a tendency *against* the formation of such configurations is likely to have produced the network. Substantively, this tendency against citation overlap, which I call differentiation, can be explained in multiple ways. One, given the paucity of time as a resource, and the continuously changing nature of research, one cannot possibly hope to read all pertinent material before producing new knowledge (Crane 1988). The opportunity cost of time imposes decision-making about what to incorporate into one's work and what to ignore. Camic (1992) refers to this process as 'predecessor selection.' Much like we saw in Chapter 2, this locally instantiated deliberation over relevance leads to the emergence of diversity of citations as different scholars make distinctive choices over and above the core authors.

Crane argues that this constraint is likely to be stronger during periods of rapid change (pp. 116-117), making for lower citation overlap in such situations. Paisley (1990) similarly argues that the effect of eclectic influences is likely to be amplified during the formative years of a field of literature.²⁷ Another possible explanation is that low overlap in citations signifies innovative thinking, some of which entails citing research lying outside the customary literature's realm, interpreted as novelty by Gilbert (1977), a preference for diversity by Powell et al. (2005) and competition by Hill and Carley (1999).²⁸ Finally, heterogeneity could be attributed to uncertainty regarding boundaries, which, as argued above, is to be expected of an emergent area.

Having linked local structures with social logics of attachment, we are now in a position to relate the formation of micro-configurations with the macro-level structural properties of the EPZ citation network. Local star structures and the associated preferential attachment logic suggest that at early stages when a literature is not yet established, referencing reputable others can perhaps be regarded as that much more crucial for situating one's work and convincing gatekeepers and evaluators. A corollary of this notion is that star structures indicate the considerable social and intellectual influence wielded by innovators in the field. In the aggregate, either form of 'preferential attachment'—authors' risk-avoidance strategies, or the relative concentration of

²⁷ I acknowledge that if the data are not exhaustive, the addition of papers may transform some of the single citations to multiple ones and so on. However, given the magnitude of singular citations, the marginal effect of adding more papers should not be very large. Moreover, the addition of more papers is also likely to increase the absolute number of singular citations.

²⁸ Admittedly some of these idiosyncratic citations are attributable to factors somewhat orthogonal to the idea of agency as defined here. For instance, Kaplan (1965:182) suggests that authors systematically cite the work of colleagues and superiors, indicative of professionalization/ training. One way to mitigate this issue would be to exclude all idiosyncratic citations whose authors appear in the acknowledgements, or are known to have close social ties with the citing author.

innovation in the hands of a few cited experts—should create a core of oft-cited authors according the network with a center-heavy structure..

Second, periphery-mediated structural cohesion alongside a negative k -two-path parameter presents an intriguing paradox. Careful consideration of the structural properties of the data helps to reconcile this apparent contradiction. A positive k -two-path parameter alongside positive star parameters would likely result in (and consequently be obtained from modeling) a highly center-heavy, ‘black hole’ type network structure. Recall that a positive k -two-path parameter is linked with highly overlapping citation profiles and a positive star parameter with preferential attachment to the core. In conjunction these effects would result in a network structure where papers were citing very many of the same authors making for a highly dense large core (the authors everyone cites) and comparatively small periphery (the few authors that are cited infrequently). Following the same logic, the presence of positive homophily parameters would likely also create dense regional clusters that are nonetheless interconnected via the large core. But, as the actual network has a small core and a multi-layered and large periphery, the negative k -two-path parameter estimate consequently represents a tendency towards citing non-core authors, indicative of scholars’ innovativeness and deliberation in an uncertain environment. Yet, as a considerable number of the non-core authors are cited multiply, those citation choices are not entirely idiosyncratic. Recall that the multiple citations of periphery authors lends substantial connectivity to the network despite the removal of more frequently cited authors. Those cited only twice each, for instance, interconnect seventy-three of the seventy-six papers. Thus, in addition to the propensity to cite non-core authors, the negative- k -two-path parameter simultaneously

also signifies the tendency of papers to be interconnected via ‘overlapping chains’ rather than through the formation of dense clusters (towards the core or in regions). Overlapping chains of the sort paper A cites authors T1 and T2; paper B cites authors T1, T2 and T3; paper C cites authors T1, T3, and T4; paper D cites T1, T4 and T5; and so on create a network that is densely connected via the core authors (such as T1) and diffusely connected via the periphery ones. This appearance of a diffusely connected network can be attributed to eclectic influences especially characteristics of an uncertain emergent setting.

Lastly, the hybrid goals of a researcher to produce findings of sufficient generality while also attending to case specifics and/or the effects of localized preferential attachment as measured by local homophily configurations result in clustering. Yet, in this case of an emergent literature, the effects of homophily are not so strong as to dissolve the regional components into pluralistic worlds connected only via a few links as argued by Daipha (2001). To the contrary, consistent with Carolan (2008), the core- as well as periphery-based inter-region connectivity points towards a type of *cohesive clustering* such that the network simultaneously displays characteristics of small-worlds as well as cohesiveness.

To summarize, the findings suggest that the citation network of an emergent area may be characterized by the combined structural features of a small densely connecting core and diffuse connectivity. Even though the stars do not hold the network together in a strictly structural sense (that is, their elimination does not lead to disconnection of the graph), a connecting core nevertheless serves as a ‘centralized anchor’ providing an emergent area of research with an identity. It materializes as new research within the field

cites it almost as a matter of necessity. Citing these exemplars as a matter of ‘compulsion’ can be viewed as a tacit response to occupying a less-institutionalized position. The periphery, in contrast, reflects discursive innovativeness, competition, and eclecticism in a climate of uncertainty leading to low overlap of non-core citations between any two papers but significant overlap across the space of the network. Thus, this field on intermediate uncertainty is characterized by both types of tacit and discursive responses outlined in the previous chapters.

As the field expands, however, two quite distinctive outcomes may obtain. Innovations may spread out across the breadth of the network diminishing its central coreness. As long as sufficient central citations persist, however, this distribution of innovations across the system should lead to a network that has some stars but is diffusely densely connected as Moody (2004) finds. Alternatively, if overall centrality is more or less completely replaced by localized centrality, then the network might split up into disconnected fragments as found by Daipha (2001). At its current stage, the network under study exhibits tendencies towards both these states – non-core actors are a source of connectivity, and key local figures form the basis of regional clustering. Future research may indicate where the field ends up.

Recall that previous studies emphasized diffuse connectivity and/or fragmentation in the absence of centrality. The differences between my findings and those from previous research can be explained on the basis of a number of factors. First, they could simply be an artifact of the data construction. Some previous research is based on one-mode networks or one-mode projections of two-mode data, the structural features of which are not directly comparable to those of two-mode networks. However, the

measures used in this study are based on recent advances in the descriptive and statistical analysis of two-mode data (Latapy, et al. 2008; Wang et al. 2009), which go a long way in rendering unipartite and bipartite analyses comparable. Second, it could be a matter of methodology. Recall that at the global level, my findings were approximately consistent with those of mature areas of research. It is possible that the application of ERGM to other knowledge networks may reveal a stronger role of preferential attachment and differentiation than is visible from a macro perspective. Of course, this is an empirical question that bears examination. There is yet a third possibility – as argued previously, these differences are the result of differences in the structure of emergent and mature areas of research.

Yet, we should not expect a linear structural transition between high and low levels of institutionalization. That is, if highly-institutionalized fields are characterized by high overall cohesion and low central density, and middling levels of uncertainty by lower cohesion but higher central density, we should not necessarily expect high levels of uncertainty to result in an even denser core and lower cohesion still. This is because the presence of some exemplars in the field reduces uncertainty-levels because it is indicative of at least some consensus in the field. It is precisely the presence of such canons that imposes moderate rather than high levels of uncertainty upon researchers. The absence of such a set of exemplars creates a basis for heightened levels of ambiguity as actors struggle to find other predecessors. This entails greater levels of deliberation and we may well find that higher uncertainty implies a more diffusely connected or even disconnected, fragmented network.

While this formal network methodology can be extrapolated to study other types of less-institutionalized positions, the empirical outcome depends on the particulars of the situation. Going back to the quotes from the women who are the subject matter of this emergent literature, would yield a network composed of women as the first mode and the practices and interpretive frames they invoke to construct meaning as the second mode. Conducting a more comprehensive analysis, we may find a loosely connected, fragmented network if there are few overlaps in cultural materials used to construct meaning. On the other hand, we could also find considerable overlap if many women are embedded in similar netdoms in other aspects of their lives and they bring those aspects to bear on this interpretive problem. In the next chapter, I develop a mathematical model to show how such overlaps in other salient netdom involvements may lead to the institutionalization of practices and interpretations generated in ambiguous situations. In general, this thought experiment as well as the findings from this study suggest that which of these various outcomes obtains depends both on the level of uncertainty characterizing the less-institutionalized position and the broader context within which the occupants are located.

Figure 4-1: Distribution of Indegrees

The left panel shows the distribution of indegrees and the right panel shows the logarithmic distribution of indegrees of the network (adjusted by a constant value of 1).

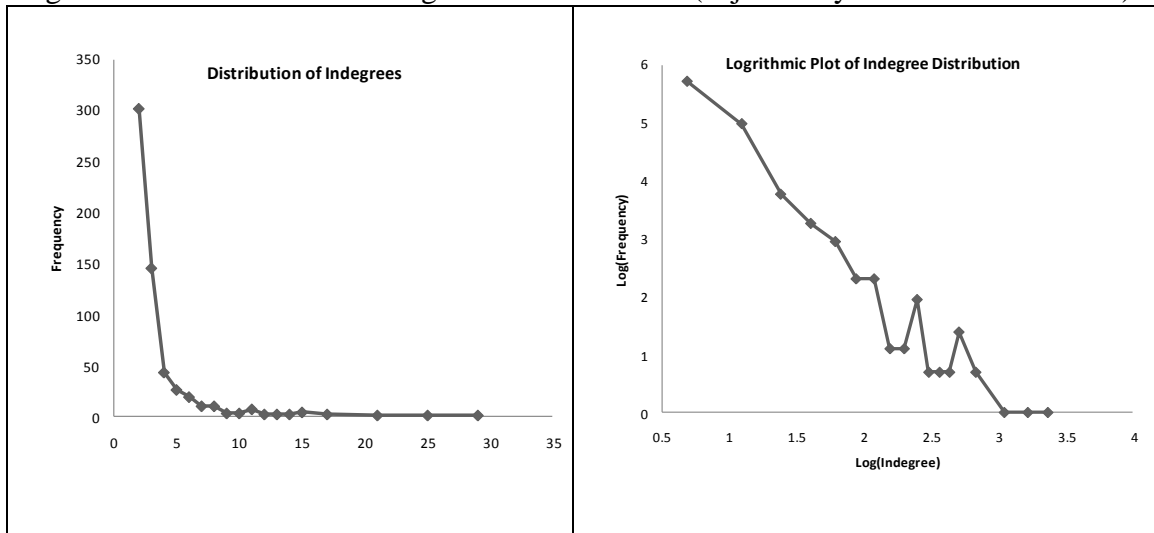


Table 4-1: Descriptive Statistics of the Network and its Regional Components

Network	Number of Citing Papers	Number of Cited Authors	Density	Average Distance
Complete Network	76	2220	2.13%	4.40
Multi-cited Network	76	562	4.54%	3.67
Asia	8	119	16.49%	3.39
Bangladesh	21	200	13.04%	3.24
China	12	178	17.79%	3.09
India	16	219	10.27%	3.60
South Asia	4	80	30.31%	3.12
Sri Lanka	15	170	15.68%	3.29

Table 4-2: Correlations between the Regional Profiles of Citations by Authors

	Bangladesh	China	India	Sri Lanka
Bangladesh	-	-.080	-.089 [*]	-.130 ^{**}
China			-.117 ^{**}	-.196 ^{**}
India				-.172 ^{**}

*Significant at the .05 level (2-tailed). **Significant at the .01 level (2-tailed), N=588

Table 4-3: Regional Group Interlinkages by Author Indegree

		China				India				Sri Lanka		
Author Indegree	2	<6	<9	>10	2	<6	<9	>10	2	<6	<9	>10
Bangladesh	3	49	89	170	18	96	128	329	5	41	89	110
China					12	57	66	96	4	11	28	65
India									7	41	55	76
Cumulative Authors	283	514	537	25	283	514	537	25	283	514	537	25

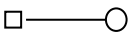
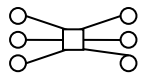
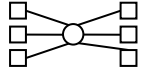
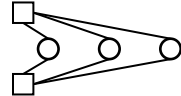
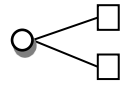
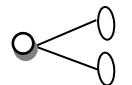
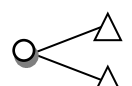
Figure 4-2: Network Visualization

The left panel with the complete network shows a core-periphery structure and complete connectedness of the network. The right panel depicts the multi-cited network. The regional grouping is apparent from the picture.



Circle: Cited Authors; Tall Rectangle: Asia; Square: Bangladesh; Ellipse: China;
Rhombus: India; Flat Rectangle: South Asia; Triangle: Sri Lanka

Table 4-4: ERGM Fit of the Multi-Cited Network

Configuration	Statistic	Estimate	Standard Error	T-Ratio
	Edge	-9.442*	0.835	-0.025
	Alternating-Paper-K-Star	3.158*	0.420	-0.030
	Alternating-Author-K-Star	0.3617*	0.122	-0.025
	Alternating-Paper-K-Two-paths	-0.375*	0.043	0.001
	Homophily Bangladesh	0.215*	0.024	-0.045
	Homophily China	0.362*	0.031	-0.018
	Homophily Sri Lanka	0.289*	0.029	0.019

* Significant Estimate.

Appendix 4-1: Exponential Random Graph Model Fits and Goodness of Fit

The model shown in the body of the article was selected after fitting numerous models with several different combinations of structural parameters. Convergence was obtained on five models:

1. A Bernoulli model (only edge parameter).
2. A model containing edge, author-k-star and paper-k-two-path parameters.
3. Model 2 supplemented by paper-k-star.
4. Model 2 supplemented by homophily parameters for Bangladesh, China, and Sri Lanka.
5. Model 3 supplemented by Bangladesh, China and Sri Lanka homophily parameters.

Among these models, the fifth was chosen on the basis of three factors: it had the smallest Mahalanobis distance (showing how far a particular network is from the center of a distribution of networks), displayed better goodness of fit (GOF) statistics (i.e. had t-ratios of less than 0.1 for the included parameters and a larger number of graph statistics that were not included in the model had t-statistics that were less than 2), and offered the most theoretically plausible interpretation of the data (Wang et al. 2009). The GOF of the models was tested using 3,000 samples from 5,000,000 iteration simulations after a burn-in of 100,000 iterations. In the GOF, some graph statistics such as lower order star parameters, four-cycles and consequently clustering coefficient and the distribution of degrees were not fit very well by the model. This can be attributed to fact that both indegree and outdegree distributions have a large range of two to twenty-nine and three to eighty-seven respectively. While the k-star parameters capture some of the effects of this

degree distribution, they fail to adequately explain the lower star parameters.

Encountering similar problems on one of their datasets, Wang et al. argue that such models can nevertheless be used for interpretation as they offer fits superior to the independent assumption of the Bernoulli model. The fitting results and GOF statistics for models 1, 3 and 5 are shown in Tables A-1 and A-2 respectively. As can be seen from the latter table, model 5 provides consistently lower statistics indicative of better fit, even for the parameters not fit in the model. The fit statistics for the lower order star parameters (particularly paper three-star) and consequently degree distributions are poorly fit in all models, yet model 5 provides the best fit amongst the models shown. The chosen model fits the k-parameters, both the set of included and excluded, particularly well.

Furthermore, the Mahalanobis distance is the smallest for Model 5.

Table 4-5: ERGM Fits to the Data

Parameters	Model 1			Model 3			Model 5		
	<i>EST</i>	<i>SE</i>	<i>T-S</i>	<i>EST</i>	<i>SE</i>	<i>T-S</i>	<i>EST</i>	<i>SE</i>	<i>T-S</i>
<i>Edge</i>	-3.05*	0.02	0.05	-12.71*	1.05	-0.05	-9.44*	0.84	-0.03
<i>Paper-K-Star</i>				4.64*	0.53	-0.05	3.16*	0.42	-0.03
<i>Author-K-Star</i>				0.77*	0.12	-0.04	0.36*	0.12	-0.02
<i>Author-K-Four-Cycle</i>				-0.48*	0.05	-0.05	-0.38*	0.04	0.00
<i>Homophily Bangladesh</i>							0.21*	0.02	-0.04
<i>Homophily China</i>							0.36*	0.03	-0.02
<i>Homophily Sri Lanka</i>							0.29*	0.03	0.02

EST: Estimate; SE: Standard Error; T-S: T-Statistic. * Significant estimate (Absolute value of t-statistic <0.1)

Table 4-6: Selected Goodness of Fit Statistics for the Models shown in Table 4-4

Parameters	Model 1	Model 3	Model 5
<i>Edge</i>	0.094	0.194	0.012
<i>Paper-Two-Star</i>	8.939	8.450	5.336
<i>Author-Two-Star</i>	6.531	3.812	2.081
<i>Paper-Three-Star</i>	38.165	42.271	24.799
<i>Author-Three-Star</i>	15.186	7.707	4.658
<i>Three-Circuit</i>	10.385	7.698	4.580
<i>Four-Cycle</i>	56.235	36.166	20.373
<i>Paper-K-Star</i>	0.109	0.172	0.020
<i>Author-K-Star</i>	-0.186	0.186	0.023
<i>Paper-K-Four-Cycle</i>	3.195	1.578	0.917
<i>Author-K-Four-Cycle</i>	-2.595	0.253	-0.046
<i>Std Dev of Degree Dist for Paper</i>	26.272	11.273	7.571
<i>Skew of Degree Dist for Paper</i>	2.988	3.957	3.068
<i>Std Dev of Degree Dist for Author</i>	18.359	24.650	16.172
<i>Skew of Degree Dist for Author</i>	30.020	47.981	38.264
<i>Global Clustering</i>	78.140	55.107	32.154
<i>Mahalanobis Distance</i>	2557.992	1497.232	776.793

Chapter 5: Cultural Institutionalization through Differential Diffusion

Abstract: In this chapter I pose the following question: how do practices and/or interpretations generated in less-institutionalized situations come to acquire cultural institutionalization? Drawing upon Blau's multiform heterogeneity and complex contagion models, I propose a mechanism and develop a mathematical model to investigate the conditions under which uncertain practices and/or interpretations generated in less-institutionalized situations diffuse at widely differing speeds across group boundaries. This can lead a behavior to become ubiquitous within some groups but not others. Once a belief/practice becomes widespread within some groups and not others, it has the potential to acquire cultural meaning from existing salient group differences. That is, it gains meaning by becoming visibly associated with existing differences, hastening its cultural institutionalization. I investigate how variations in four factors implicated in the mechanism— levels of salient group homophily, adoption-thresholds, network-size, and relative size of the two groups produce this outcome.

Introduction

In Chapters 2 and 4, I have argued that individuals in less-institutionalized positions draw on a wide variety of traditions to construct meaning in uncertain situations. This interplay of structural contingencies in less-institutionalized positions and cultural transposition can lead to the generation of a new set of practices and interpretive schemas. In the case of EPZ workers, this could include the formation of new relationships and the straining of older ones, accumulation of dowry by daughters rather than parents, and greater freedoms. In the case of scholars writing on this phenomenon, it

meant the formation of a new set of central and regional exemplars that would shape the field in future years. In addition, evidence for eclecticism and differentiation showed that these scholars were also drawing together multiple traditions of research in a novel way. Despite this emergence of novelty, these practices and interpretations can be viewed as ‘in-flux’ rather than routinized. In this chapter, I propose a mechanism through which such nascent cultural materials can come to acquire cultural institutionalization. While cultural institutionalization can occur in a top-down way such as through social closure (Weber 1978) and efforts of formal organizations (DiMaggio 1992, Schwalbe et al. 2000), I develop a ‘bottom-up’ *relational mechanism* that explains how emergent cultural differences can come to be institutionalized.

Specifically, drawing on Blau’s (1977) thesis on multiform heterogeneity, I investigate the conditions under which the structure of social networks – particularly homophily along a highly-institutionalized attribute such as race and gender – and the distribution of the population across such groups interact to produce a ‘differential diffusion’ of a belief/practice associated with a less-institutionalized (henceforth less-institutionalized belief/practice) across categories of the characteristic. Diffusion is differential if the spread of behavior across groups occurs at significantly different speeds such that contagion occurs much faster in some groups or if contagion occurs only in some groups and not others (DiMaggio and Garip 2011). Once a less-institutionalized belief/practice becomes widespread within one group, it has the potential to become associated with that group thereby acquiring meaning from it and hastening its cultural institutionalization. Uneven diffusion of behavior in this mechanism is contingent upon the belief or practice being characterized by ambiguity. Unlike diseases and information

which usually spread through contact with a single source, transmission of behavior marked by uncertainty (as is the case with less-institutionalized beliefs/practices) frequently requires social reinforcement and consequently needs multiple distinct sources of exposure. This type of diffusion has higher thresholds and is referred to as complex contagion (Centola 2010, Centola and Macy 2007, Granovetter 1978).

The mechanism operates under the following initial conditions: (1) there exists some less-institutionalized belief/practice (or set of) with few initial adherents, (2) there also exists some highly-institutionalized characteristic that divides the population into categories and forms the basis for relational homophily, (3) the latter highly-institutionalized characteristic is correlated with the former less-institutionalized belief/practice such that adherents are disproportionately present in one category of the highly-institutionalized characteristic, and (4) adoption of the less-institutionalized belief/practice is contingent upon receiving multiple affirming and reinforcing signals from others perceived to be similar to oneself on the highly-institutionalized characteristic.

EPZ workers from Chapter 2 can be used as an example that satisfies this set of conditions. We know that uncertainty leads to the recombination of multiple cultural rules and structural conditions generating new practices and interpretations that are themselves yet in flux (condition one). Since meaning-construction from recombinant analogizing and contrasting depends on one's stock of knowledge in other realms, it is likely to be organized around salient, highly institutionalized characteristics like region, religion, and socioeconomic class (condition three). Also, as EPZs attract women from diverse regions, it is also not unreasonable that such salient characteristics form a basis

for networks of friendships, advice, trust, and general interaction within the factory as well as in living quarters (condition two). In an environment marked by uncertainty, it is likely that women share experiences with and take the word of people they trust in small group or network settings (Strang and Meyer 1993). But uncertainty implies that experiences need to be common to a few people to gain affirmation and hence validity within small-group settings as suggested by research on complex diffusion (Centola 2010) (conditions four). That is, if two or three women emphasize similar experiences, they are more likely to be able to convince other common close friends than if everyone has unique experiences in an uncertain setting. In this situation, we may find that novel ideas and practices diffuse first within small groups or networks composed of individuals who share a salient attribute and have sufficient basis for uncertainty negotiation through affirmation of common experiences and then spread more widely within the salient attribute through overlapping involvements in networks across home, work, and other settings. This mechanism implies that interpretations and practices may spread within homophilous networks defined by salient characteristics (Hindu women versus Muslim women, for example) and hence come to be aligned with existing group differences that are already separated as ‘islands of meaning’ (Zerubavel 1991). The spreading within a highly-institutionalized attribute makes common behavior shared and alignment with that characteristic gives it a sense of normativity (Bourdieu 1984).

Four sets of factors have been shown to shape diffusion outcomes – the characteristic of the belief/practice, thresholds of adoption, the structure of social networks, and the broader geographical, political, cultural, and social-systemic context (e.g. Granovetter 1978, Mahajan and Peterson 1985, Rogers 1983, Strang and Meyer

1993, Strang and Soule 1998, Wejnert 2002). I focus on social-systemic determinants as their link with diffusion remains relatively underspecified (cf. Kaufman and Patterson 2005). Particularly, drawing on Blau's (1977) multiform heterogeneity and Skvoretz's (1983) formalization of Blau's work, I investigate how variations in (1) the distribution of the population across the highly-institutionalized characteristic, (2) correlation of the population distribution of highly-institutionalized characteristic and the initial distribution of less-institutionalized belief/practice, (3) the degree of homophily characterizing the highly-institutionalized characteristic, and (4) different thresholds and network sizes affect the likelihood of differential diffusion. Expanding upon previous research that emphasizes variability in social network structure and adoption thresholds across groups to effect differential diffusion, I demonstrate that such divergence in diffusion may obtain even if network structures and adoption thresholds are similar across groups given suitable social-systemic conditions.

I draw on Ridgeway's (1991) theory of status-construction, but the mechanism I propose is distinct in three ways. One, rather than analyzing status-construction, I focus on the cultural institutionalization. Two, my focus of inquiry is on an initially less-institutionalized belief/practice rather than an evaluated, socially-meaningful, exchangeable resource (Ridgeway's focus) or other attributes such as 'valued personal characteristics' like honesty and trustworthiness (cf. Webster and Hysom 1998). Blau argues that multiple salient characteristics that are correlated with one another can impede societal integration by reinforcing social boundaries.²⁹ Mark (1998) and Axelrod (1997) make similar arguments to explain the emergence of inequality on the basis of

²⁹ Salience, according to Blau, manifests in tendencies towards homophily. A characteristic is salient if it forms the basis for homophily.

informational and cultural homophily. I argue that such contra-integrative effects can obtain even if the correlated characteristic is initially less-institutionalized and hence not a basis for homophily. Three, because my puzzle concerns institutionalization rather than production, I rely on theories and findings about complex contagion as it relates to behavioral diffusion rather than expectation-states theory as Ridgeway does.

The analysis presented here also applies equally to the preservation of boundaries of groups marked by status inequality. Moreover, the analysis speaks both to large-scale heterogeneities like gender, race, and religion, as well as local group differences like in formal organizations, social movements, and schools. I begin by describing three determinants of behavioral diffusion – thresholds as they relate to cultural institutionalization, social network structure, and social-systemic structure. This is followed by a narrative account of the mechanism I propose. Subsequently, I describe a mathematical model and investigate its properties for likelihood of differential diffusion.

Determinants of Social Diffusion

Beliefs, practices, ideas, and innovations, often spread through social contact (e.g. Granovetter 1978, Rogers 1983). In a now classic study, Coleman, Katz, and Menzel (1957) explain the spread of tetracycline through social diffusion – initially doctors integrated in advice and professional discussion networks adopted the innovation. Subsequently, influence spread through friendship ties to other doctors. Others similarly explain the diffusion of valuable information (Granovetter 1973, 1983, 1995[1974]), rumors (Lai and Wong 2002), health behaviors (Centola 2010), diagnoses of autism (Liu, King, and Bearman 2010), happiness (Fowler and Christakis 2008), obesity (Christakis

and Fowler 2007), social movements (Fernandez and McAdam 1988, Mische 2007, Soule 1997), new technologies, and migration (DiMaggio and Garip 2011) via social networks. Social behavior, then, much like diseases can be ‘contagious.’ What are the determinants of such social diffusion?

Threshold Effects: A key determinant of behavioral diffusion is the frequency of exposure needed to ‘infected’ persons to facilitate adoption. A ‘simple’ contagion posits that contact with a *single* source is enough to transmit influence. Simple contagions are appropriate descriptors of the diffusion of most diseases and information. Alternatively, adoption of behavior may require contact with *multiple* sources. This is because, unlike diseases and information, behavioral adoption frequently needs reinforcement and affirmation from multiple people. Such processes of diffusion have been termed ‘complex contagions’ (Centola 2010, Centola and Macy 2007).

Complex contagion models are a local or personal network version of aggregate threshold or tipping point models where a critical mass of adoption at the population-level induces large-scale adoption (Granovetter 1978, Granovetter and Soong 1988, Schelling 1978). At the level of local networks, multiple sources of influence from personal relationships may be necessary because information is uncertain or ambiguous (DiMaggio and Garip 2011, Gibbons 2004, Liu et al. 2010, Rogers 1983, Wejnert 2002). For example, complex contagions have been argued to be an appropriate framework to explain the adoption of new technologies and behaviors that entail externalities, higher costs, contravene existing norms, involve ambiguous information, and/or are risky (e.g. Centola, Willer, and Macy 2005, Coleman et al. 1966, DiMaggio and Garip 2011, Granovetter 1978, Hedström 1994, Valente 1993). But, properties of ambiguity and

uncertainty also apply to less-institutionalized beliefs/practices. In such situations, adopters may be cautious, needing affirmation, convincing, and interpretive work from multiple members of their networks whom they trust on account of repeated interactions and/or because of mutually shared aspects of their identity. Even if influence can flow through non-personal channels such as popular media, one may still need positive signals from network members who serve as reference groups (Chaves 1995, DiMaggio and Powell 1983, Soule 1997, Strang and Meyer 1993, Strang and Soule 1998).

Social Network Structure: The structure of social networks affects how contagion – both social and biological - passes through them. Bearman, Moody, and Stovel (2005), for example, articulate three models of diffusion. According to the ‘core’ model, a group of densely interconnected actors sustain infection by circulating it amongst themselves and passing it outwards to a less densely connected population. In an ‘inverse core’ model a group of central infected persons pass infection to others but not directly amongst themselves. In the third model, densely interconnected high-risk actors (such as intravenous drug users) pass infection to low-risk groups through *bridges* connecting the two populations. A bridge is the only path connecting two otherwise disconnected parts of a network. The removal of a bridge fragments the network. A ‘local’ bridge similarly connects two otherwise disjoint ego-centered networks that, in the absence of the bridging nodes, would have no members in common (see Centola and Macy p. 710).³⁰ These ideal-typical models illustrate the key role played by the micro- and macrostructure of the networks connecting actors in processes of diffusion. Features of connectivity such

³⁰ An ego-centered network consists of a focal actor, ego, and the set of nodes – alters- connected to ego, as well as the ties connecting the alters to each other.

as a global core-periphery structure, pockets of high density, and local and long-range cyclicity have significant implications for the spread of disease and ideas.

Centola (2010, p. 1194) compares two competing hypotheses relating spread of contagions to network structure. He argues that since contact with a single infected person is enough to transmit behavior in simple contagions, network structures with pockets of high density and *single bridges* connecting those pockets are appropriate for simple contagions. The network structure most conducive to the spread of behavior needing social reinforcement, on the other hand, is locally dense ties and *multiple bridges* connecting those pockets of high density (Centola and Macy 2007). Multiple local bridges occur if several actors jointly straddle two or more local network neighborhoods. The redundancy of multiple bridges is a ‘waste’ in simple contagions because additional bridges carry no new information beyond what the first bridge does. This same redundancy, however, is necessary when behavioral transmission is dependent on multiple reinforcing signals. Imagine, for example, two garment workers who decide to start accumulating dowry to improve the prospects on the marital market. If the threshold for transmission is at least two, neither woman alone can transmit the idea singly (say, to their distinctive friendship or occupational networks). That is, neither may be able to transmit that behavior to networks in which only one of them is a member. But, they can transmit to other networks to which they jointly belong. This somewhat simplistic illustration conveys the general idea that whereas a single bridge and consequently a single bridging actor is sufficient to transmit behavior in a simple contagion (threshold of one), complex contagions with higher thresholds spread with the aid of multiple ties interconnecting two ego-networks.

Social-Systemic Structure: Blau (1977) argues that social structure at the macro level is composed of ‘multiform heterogeneity’ or the interaction of multiple attributes differentiating actors from one another. Any given attribute can become a basis for homophily - the psycho-social preference for interacting with similar others (McPherson, Smith-Lovin, and Cook 2001, Wimmer and Lewis 2010). Such tendencies toward homophily induce homogeneity in social networks. The combined effect of two or more homogeneity-inducing parameters depends upon the degree of correlation between them. When two parameters are highly correlated, or *consolidated* in Blau’s terms, socioeconomic class and race, for example, social interaction structured by these categories reinforces social boundaries. Such consolidation should results in social networks that are homogeneous along both race and class. In contrast, the absence of correlation, or *intersection* as Blau dubs it, promote intergroup relations strengthening macrosocial integration.

Thus, there are three parameters describing two-dimensional multiform heterogeneity – the distribution of the population, the level of consolidation (and inversely intersection), and the degree of homophily characterizing the two attributes.³¹ These parameters measured at the aggregate-level can be used to describe network structure at the micro-level in terms of the likelihood of interaction between people fitting different categories (Skvoretz 1983). If the two parameters are race (say, white and black) and socioeconomic class (say, high and low), for example, a high correlation between race and class combined with high degrees of homophily within each category suggests that micro-level social networks are composed of individuals who are similar on both

³¹ Additional parameters such as preferences for heterophily can supplement the system.

race and class. The proportion of high and low-status and white and black individuals in the population, moreover, determine the proportion of personal networks that are likely to be homogenous along the joint race-class category. A small high-status and black population, for example, implies fewer network neighborhoods that are composed of high-status black people.

While we know that how social network structure and threshold forms affect behavioral adoption, we know comparatively less about how social-systemic factors identified by Blau – the distribution of the population across different categories, correlations between them, and homophily – shape diffusion processes. Combining insights from Blau’s theory and expectations-states theory, Ridgeway (1991) developed a model that specifies a means by which nominal characteristics like race and gender can acquire consensual status value. Her model has been tested and successfully shown to be valid in experimental research (Ridgeway and Correll 2004 and 2006, Ridgeway and Diekema 1989, Ridgeway et al 1998) as well as useful for explaining trends in survey data (Brashears 2008). Next, I show how Blau’s thesis on two parameters of differentiation can likewise be applied to study cultural crystallization of less-institutionalized beliefs/practices.

Differential Diffusion

I begin with a set of initial conditions modeled around Blau’s framework of multiform heterogeneity. There exists a less-institutionalized belief/practice that is unevenly distributed in the population. For simplicity, I assume a dichotomous distribution although the model can be adapted to account for greater complexity.

Initially a small proportion of individuals subscribe to this belief or practice. Call the individuals who have this belief/practice, P , P^o s and those who do not, P^n s. This belief/practice is socially less-institutionalized and therefore not a basis for homophilous interaction. Whereas religious beliefs may be a basis for homophilous interaction, novel income allocation habits amongst EPZ workers or left-handedness may not be salient enough to generate preferential interaction. Likewise, citing a different stock of literature may not be salient enough to facilitate or encourage interaction at academic conferences. This implies that P^o s do not seek out other P^o s for interaction and likewise neither do P^n s.

Consider a second attribute to be an evaluated and socially salient highly-institutionalized characteristic which is a basis for homophily. For simplicity, let's assume that this highly-institutionalized characteristic S is divided into two categories S^h and S^l . For convenience, I refer to S^l s and S^h s as low and high status respectively, although we can replace these with any other categorical designations. I, therefore, refer to S as a status characteristic. Assume S and P are initially correlated or consolidated. S and P would be consolidated, for example, if P^o s are more likely to be high status than low status. If the population was evenly divided between S^l s and S^h s but seventy percent of all P^o s were of high-status while only thirty percent were of low-status, then P and S would be consolidated.

Following Skvoretz, these three conditions surrounding P and S (distribution of the population along the two characteristics and level of consolidation) can generate biased probabilities of interaction with and consequently exposure to P^o s and their beliefs/practices amongst high and low status. These different probabilities can potentially, if behavior is complexly (rather than simply) contagious, lead to discrepant

rates and equilibrium levels of diffusion of the belief/practice amongst the two categories of the highly-institutionalized characteristic.

The mechanism by which this occurs is as follows: if S and P are consolidated in such a way that believers/practitioners are initially disproportionately high-status individuals, and interactions are homophilous along that attribute, then high-status people are likely to be exposed to greater numbers of believers/practitioners, *even without actively seeking them out*. By virtue of preferential interaction with others who are similar to them in the highly-institutionalized characteristic, they happen to also interact with relatively more believers/practitioners than they would if S and P were uncorrelated or intersecting. Low-status individuals, in contrast, have relatively lower per capita availability of P^os amongst them – both in comparison to high-status and relative to the share of low-status individuals in the system. Consequently, by interacting with others who are like them in status, they end up interacting with and hence being exposed to fewer believers/practitioners, on average, than high-status individuals. Homophily along status and consolidation of status and the less-institutionalized belief/practice are enough to produce these biased probabilities of interaction. Assuming that the less-institutionalized belief/practice is likely to transmit via exposure to multiple others which produces social affirmation as argued in complex contagion models of behavioral diffusion, the comparatively greater likelihood of exposure of high-status individuals to P^os is more likely to generate a speedier and more widespread diffusion over time amongst high-status individuals than low-status individuals exacerbating the initial consolidation. How can such differentiated diffusion produce institutionalization of the belief/practice?

Symbolic differences sustain group boundaries via the creation and management of social and cultural exclusion (Lamont and Lareau 1988, Schwalbe et al. 2000, Sewell 1992). Such exclusivity can be achieved and maintained through different channels. Classically, Weber (1978) argues that interest groups manage access through social closure such as the establishment of associations and credentialing. Stressing the institutional basis of inequality-preservation, DiMaggio (1992) likewise argues that organizations such as boards of trustees in museums act as gatekeepers. Stressing both the formal organization and informal familial bases of inequality preservation, Bourdieu (1977[1971]) argues that intergenerational transmission, socialization, and training within the family and higher educational institutions and differential rewards in educational institutions act to maintain class-based inequalities. More generally, Crane (1992, see also Lamont and Molnár 2002, Zerubavel 1997) argues that *difference* (rather than intrinsic content) is a fundamental property of maintaining boundaries between groups. Such maintenance of difference can arise through various channels such as economic constraints, formal institutional gatekeeping, and credentialing thereby helping to create or maintain inequality.

Similarly, we can think of personal networks as enabling or constraining such differences. Halle (1992), for example, finds that differences in the consumption of abstract art are not necessarily traceable to differences in training and tastes, as Bourdieu would argue. Rather, it could be about influence – how many of one’s friends also display and appreciate abstract art. This suggests that, similar to dispositions, credentialing, or formal institutions, regulation of access can be traced to social networks. Insufficient exposure within one’s social network can limit one’s ability to adopt a

behavior (e.g. Gondal and McLean 2013). Conversely, high adoption rates amongst network members can positively influence ego's adoption. Imposing a class logic on this argument, Rogers (1983:275) contends that because interactions tend to be homophilous, diffusion of ideas is limited by class structure. Elites tend to interact mainly with other elites causing new ideas to spread horizontally but not vertically. The greater concentration of believers/practitioners within the high status can likewise spur diffusion leading to contagious adoption within high-status actors whose networks are predominantly composed of other high-status individuals. At the same time, the lower concentration in the low-group prevents diffusion take-off.

Sufficient discrepancy in adoption rates can create conditions suitable for the legitimization of the material by virtue of being aligned with one group rather than another. With respect to socioeconomic class, Bourdieu (1984, p. 246-250) argues that even without the conscious intention of the pursuit of distinction, cultural differences can come to be viewed as class moralities and aesthetics if they are aligned with existing relationally-defined positions in the class structure. He argues that privileged classes recognize their culture in the "latest difference which is also, very often, the latest conquest" (p. 247). These differences are powerful when they are diffused widely enough in one class to become banal in that class allowing occupants of social positions to distinguish themselves on those bases. In the most Saussurian sense, the 'value of culture' thus exists only relationally (see also Lamont and Lareau 1988, Swidler 1986, Zerubavel 1997 p. 72-80). Cultural institutionalization of the belief/practice, in such cases, draws from the group it is associated with rather than the intrinsic properties of the material itself.

The extent and degree to which diffusion occurs differentially in this model depends on the parameters of multiform heterogeneity, the structure of social networks, as well as the functional form of the threshold for adoption. While previous research (Centola 2010, Centola and Macy 2007, DiMaggio and Garip 2011, Gibons 2004) demonstrates the effect of network structure and variations in threshold forms for diffusion, they say little about how variations in Blau's social-systemic level – in the size of different groups as well as in the rates of intersection/consolidation affect diffusion outcomes. DiMaggio and Garip make valuable contributions towards this by using simulation studies on several characteristics including income, education, and race. Yet, simulations restrict their investigations to certain parts of the social-systemic state space. A mathematical approach complements this simulation research to offer a fuller investigation of the conditions surrounding differential exposure (see Kitts 2008 for a comparison of simulation and mathematical approaches to research).

I next investigate how variations at the social-systemic level affect likelihood of exposure to sources after summarizing the model conditions.

Structural Conditions

- 1) There exists a less-institutionalized belief/practice that is unevenly distributed in the population. Believers/practitioners are called P^o and non-holders are P^n . The initial size of the adopting population is small. These beliefs/practices are transmittable in interaction.

- 2) There also exists a highly-institutionalized characteristic which is a basis for homophilous interaction. This highly-institutionalized characteristic S is divided into two categories S^h (high) and S^l (low).
- 3) S and P are initially consolidated such that P^o 's are disproportionately S^h s.³²
- 4) Diffusion of the less-institutionalized belief/practice is complex rather than simple requiring multiple signals of reinforcement.

Parameterization of the Model

[Figure 5-1 (about here)]

Social-system: The four conditions delineated above are stylistically depicted in Figure 5-1. In this model, individuals are differentiated along two dimensions – an existing heterogeneity (S) and an initially non-salient characteristic (P). S is divided into two socially salient categories: that, for convenience, I refer to as high (S^h) and low (S^l). The distribution along S is such that a proportion β are high-status and $(1-\beta)$ are low-status individuals. P is divided into two less-institutionalized categories – believers/practitioners (P^o) and non-believers/practitioners (P^n). P^o s occur with probability α and P^n 's with probability $(1-\alpha)$. P s are further subdivided along S to produce the joint category SP such that x percent of P^o s are S^h s and $(1-x)$ percent P^o s are S^l s.

[Tables 5-1a-d (about here)]

If S and P were independent attributes, the probability of belonging to the joint category SP would be a multiplication of their individual probabilities S^iP^j . Table 5-1a

³² Since P is not institutionalized initially, this correlation between S and P could arise for any reason. The point is that for whatever reason it arises, it can yield differential diffusion.

depicts such a case. Twenty percent of the population is high-status and eighty percent is low-status, while thirty percent are P^o and seventy percent are P^n . Probabilities of joint occupancy are shown in the matrix. Table 5-1b shows the generic derivations of these probabilities as functions of β and α . In Blau's terms, these two characteristics would be intersecting. Intersection implies that $x = \beta$. In words, if P and S are uncorrelated, the percentage of believers/practitioners that are high-status would equal the percentage of high-status individuals in system as a whole, on average. Alternatively stated, if we picked a position-holder at random, independence implies that the individual would be high-status with probability β .

P and S are correlated if P^o s are disproportionately present amongst S^h s. In Blau's terms, P consolidates S or ($x > \beta$). Consolidation is illustrated in Table 5-1c. Even though thirty percent of the population is high-status, they occupy forty percent of the positions resulting in a joint $S^h P^o$ probability value of twelve percent in contrast to the six percent in the independent case. As opposed to eighty percent of the positions in the independent case, low-status individuals now hold only sixty percent of positions. Fixing x , allows us to derive the remaining probabilities as general functions of x , β , and α . This is depicted in Table 5-1d. Note that $S^h P^o$ in Table 5-1d is greater than the corresponding value in Table 5-1b only if $x > \beta$ as long as $\alpha > 0$.³³ I will refer to the excess of x over β as the degree of consolidation.

The final parameter characterizing the system is homophily in interaction. The rate of homophily – a measure of the strength of preferential interaction with similar others - along the highly-institutionalized characteristic is denoted by τ . τ denotes the

³³ This is simple to see: $\alpha x - \alpha \beta > 0 \Rightarrow \alpha(x - \beta) > 0$. If $\alpha > 0$, then $(x - \beta) > 0$.

percentage of time people chose to associate with someone similar to themselves on status. I assume that τ is constant for S^h and S^l . This assumption holds the structure of networks constant across group boundaries allowing us to isolate the effects of population distribution and consolidation on diffusion.

Probability of Exposure: I analyze likelihood of differential diffusion under the assumption that behavioral adoption is contingent upon receiving multiple signals from status-similar others. This assumption is consistent with adopter theorization (Strang and Meyer 1993) and mimetic adoption (DiMaggio and Powell 1983). Theorization amounts to shared understandings about similarities between members of the population. Strang and Meyer argue that high levels of adopter theorization facilitate and hasten diffusion. Mutual recognition will spur adoption because others who are perceived to be similar have adopted. Dimaggio and Powell similarly argue that when an organizational field becomes established, mimetic forces yield homogenization as organizations model themselves after others as a response to uncertainty. This is likely to occur in situations where highly-institutionalized characteristics are theorized and trust or insider knowledge is important. We are much more likely to believe in the merit of a new sociology journal if we receive signals from fellow sociologists, rather than fashion designers, for example.

This assumption implies that only ties to homogeneous others are useful for adoption. Heterogeneous ties are, for purposes of adoption, a 'waste.' According to the social-system outlined in Figure 5-1, the probability of ingroup ties along status who also happen to be P^o 's is composed of two parts: (1) the alter is selected on the basis of status homophily and happens to be a P^o and (2) the alter is not selected on the basis of status homophily but nonetheless happens to be a P^o and similar in status. In the first case,

individuals prefer ties with others like themselves, and in looking for such similar others, they chance upon P^o s with the likelihood of their occurrence in ego's salient status. In the second case, individuals are not particularly looking for like others, but there is nevertheless some chance that in looking to form ties with *anyone*, they happen to connect with someone who is like them. The probability of the first occurrence is $\tau P(P^o/S^i)$ – the propensity for status-homophily multiplied by the conditional probability of being a believer/practitioner given the probability of occupying a certain status. The probability of the second occurrence is $(1 - \tau)P(P^o \cap S^i)$ – the probability of non-homophilous ties multiplied by the probability of being a position-holder and of a given status. These probabilities are derived under the standard assumption of homogeneity of actors which implies that the probability is the same across actors within a group (see, for example, Rahmandad and Sterman 2008). Moreover, the networks are random other than the tendency towards homophily. In accordance with Table 5-1d, the two equations are:

$$P(S^h \text{ tied to } S^h \text{ and } P^o) = P_h^1(t) = \tau \frac{\alpha(t)x(t)}{\beta} + [1 - \tau]\alpha(t)x(t) \quad (1)$$

$$P(S^l \text{ tied to } S^l \text{ and } P^o) = P_l^1(t) = \tau \frac{\alpha(t)[1 - x(t)]}{(1 - \beta)} + [1 - \tau]\alpha(t)[1 - x(t)] \quad (2)$$

Equation 1 is the probability that an associate of a high-status individual is both high-status and P^o . Likewise, Equation 2 is the probability that an associate of a low-status individual is both low-status and P^o . The equations assume that homophily (τ) and size of groups (β) are constant whereas, given the dynamic nature of diffusion, the overall proportion of practitioners/believers (α) and the proportion of them who are high-status

(x) vary over time. These equations yield biased probabilities of interaction with status-similar P^o s that are variable over time. If homophily is 0.8, P^o s comprise 10 percent of the population, S^h s 30 percent of the population, and 50 percent of the P^o s are S^h s, for example, Equations 1 and 2 imply that the probability that a high-status actor's association with a status similar P^o is 14.3 percent, and the corresponding probability for a low-status actor is 6.7 percent. Thus high-status actors are more than twice as likely as low-status actors to be exposed to P^o s who are similar to them in status or to be exposed to effective signal-bearers. Higher thresholds of adoption imply that we are interested not just in the probability of a single tie being an effective signal, but multiple such ties being so. Moreover, due the dynamic nature of diffusion we need to account for how these probabilities evolve as more people successively adopt the initially less-institutionalized belief/practice.

Dynamic System of Equations

: Equations 1 and 2 can be used to derive corresponding equations for the likelihood of receiving multiple signals or the probabilities that m or more of an individual's k associations are status-homogeneous P^o s. For example, if an actor has six ties and minimally two signals are necessary for adoption (two being the threshold), then we are interested in the likelihood that at least two of her six associations are status-similar P^o s (which is the same as one minus the probability that none are or only one is). This can be written as:

$$P_h^{\frac{2}{6}}(t) = 1 - [1 - P_h^1(t)]^6 - 6[1 - P_h^1(t)]^5 [P_h^1(t)]$$

$$P_l^{\frac{2}{6}}(t) = 1 - [1 - P_l^1(t)]^6 - 6[1 - P_l^1(t)]^5 [P_l^1(t)]$$

Using the binomial theorem, this yields a set of coupled probability equations for high- and low-status actors such that m of their k ties are status-homogeneous P^0 s.

$$P_h^{\frac{m}{k}}(t) = 1 - \sum_{i=0}^{k-1} {}^m C_i [1 - P_h^1(t)]^{m-i} P_h^1(t)^i = P_h(t) \quad (3)$$

$$P_l^{\frac{m}{k}}(t) = 1 - \sum_{i=0}^{k-1} {}^m C_i [1 - P_l^1(t)]^{m-i} P_l^1(t)^i = P_l(t) \quad (4)$$

I will refer to these as $P_h(t)$ and $P_l(t)$ for short. These equations capture the dynamic diffusion process. If initial probabilities of exposure are higher in the high-status group, more high-status than low-status people are likely to adopt the behavior. With greater high-status adoption, the belief/practice becomes even more consolidated with the high-status. The probabilities consequently become more divergent in the next period. This probabilistic differential equation model assumes that transitions from non-adopter to adopter are modeled as expected values (see, for example, Rahmandad and Sterman 2008). For instance, if Equations 3-4 yield probabilities of 0.07 for high-status and 0.01 for low-status, we can expect seven percent of high-status and one percent of low-status non-adopters to become adopters in this period and become additional signals-bearers in the subsequent period, on average. Thus the expected number of adoptees is contingent both on the probabilities of adoption in Equations 3-4 and the number of available non-adopters. This is based on the standard ‘Internal-Influence Model’ in which diffusion is

solely a function of interactions between prior adopters and potential adopters in the social system (Mahajan and Peterson 1985).

If the total population is N , the number of high-status actors is N_h , and the number of low-status actors is N_l , the number of high-status and low-status adopters are respectively N_h^A and N_l^A , new adoptions are a product of the probability of adoption multiplied by the number of available adopters (those who have not yet adopted).

$$\text{New High-Status Adoptions} = n_h(t) = P_h(t)[N_h - N_h^A(t-1)] \quad (5)$$

$$\text{New Low-Status Adoptions} = n_l(t) = P_l(t)[N_l - N_l^A(t-1)] \quad (6)$$

$$N_h^A(t) = \sum_{i=0}^t n_h(i) \quad (7)$$

$$N_l^A(t) = \sum_{i=0}^t n_l(i) \quad (8)$$

where

$$\begin{aligned} N_h^A(0) &= \alpha(0)x(0)N \\ N_l^A(0) &= \alpha(0)[1-x(0)]N \\ \alpha(t+1) &= \frac{N_h^A(t) + N_l^A(t)}{N} \\ x(t+1) &= \frac{N_h^A(t)}{N_h^A(t) + N_l^A(t)} \end{aligned} \quad (9)$$

Equations 1-9 set up a system of recursive equations that can be used to study the trajectory of diffusion based on a set initial of conditions. Equations 5-6 can also be thought of as the rate of change in adoptions. But because probability and potential adopters vary over time, the rate is itself variable over time rather than constant.

Algebraic manipulation and recursive substitution in Equations 5-8 yield another set of coupled equations where total high- and low-status adoptions can be expressed as functions of the initial levels of adoption and probabilities of adoption.

$$N_h^A(t) = \alpha(0)x(0)N + [N_h - \alpha(0)x(0)N] \left[\sum_{i=0}^{t-1} P_h(i) - \sum_{i=0}^{t-1} \sum_{j=0}^{t-1} P_h(i)P_h(j) + \sum_{i=0}^{t-1} \sum_{j=0}^{t-1} \sum_{k=0}^{t-1} P_h(i)P_h(j)P_h(k) - \right. \\ \left. \sum_{i=0}^{t-1} \sum_{j=0}^{t-1} \sum_{k=0}^{t-1} \sum_{l=0}^{t-1} P_h(i)P_h(j)P_h(k)P_h(l) + \dots \right]$$

$$N_l^A(t) = \alpha(0)[1 - x(0)]N + [N_l - \alpha(0)[1 - x(0)]N \left[\sum_{i=0}^{t-1} P_l(i) - \sum_{i=0}^{t-1} \sum_{j=0}^{t-1} P_l(i)P_l(j) + \sum_{i=0}^{t-1} \sum_{j=0}^{t-1} \sum_{k=0}^{t-1} P_l(i)P_l(j)P_l(k) - \right. \\ \left. \sum_{i=0}^{t-1} \sum_{j=0}^{t-1} \sum_{k=0}^{t-1} \sum_{r=0}^{t-1} P_l(i)P_l(j)P_l(k)P_l(r) + \dots \right]$$

where $i < j < k < l$ and $i < j < k < r$

Analysis

Given an initial set of conditions, further adoptions will take place within each status-group only if Equations 5-6 equal at least 1. Initially when the gap between adopters and potential adopters is quite large, the probability of being exposed to a sufficient number of adoptees needs to be sufficiently high to induce adoption. Minimally, the probability should be high enough so that at least one person, on average, is likely to adopt. That is, if

$$P_h(t)[N_h - N_h^A(t-1)] \geq 1 \Rightarrow P_h(t) \geq \frac{1}{[N_h - N_h^A(t-1)]} \quad (5a)$$

and

$$P_l(t)[N_l - N_l^A(t-1)] \geq 1 \Rightarrow P_l(t) \geq \frac{1}{[N_l - N_l^A(t-1)]} \quad (5b)$$

Using these modified equations, we can delineate four differential diffusion scenarios on the basis of initial probabilities of adoption.

1. *No take-off*: if the initial probabilities are less than required for both groups, diffusion will fail to take-off in either group. This might occur, for example, if there are very few people who have common experiences. The less-institutionalized belief/practice will not be able to draw on existing boundaries to yield institutionalization via the mechanism outlined in this chapter.
2. *Marginally differentiated diffusion*: In this case, both initial probabilities are large enough to induce contagion in both groups. If the high-status probability is larger than low-status probability, contagion will likely occur faster in the high-status than in the low-group. At the time of complete high-status contagion, the proportion of low-status adoption will be lower but not by very much. While the belief/practice may become widely used, it might not acquire cultural institutionalization (Colyvas and Jonsson 2011).
3. *Highly differentiated diffusion*: if the initial probability of high-status adoption is considerably higher than required, while the low-status probability only marginally meets the condition, diffusion and contagion will occur much faster

within the high-status population. At the time of high-status contagion, proportion of low-status adoption will be very low leading to a considerable gap between high- and low-status adoption levels. This creates a period in which the less-institutionalized belief/practice can become the ‘latest difference’ between statuses, as Bourdieu describes it, acquire high-status legitimation.

4. *Perfectly differentiated diffusion*: if the probability of high-status adoption is greater than required, and the probability of low-status adoption is below required, diffusion and contagion will occur in the high-group, but not in the low-group. This will lead to a sustained difference between high and low-status adoption over time. Like in the previous case, the uneven adoption of the material here creates conditions suitable for cultural institutionalization of the less-institutionalized belief/practice. In this situation practices will spread within certain groups and not at all in others.

The probabilities in Equations 5a-6a are functions of the level of homophily (τ), the population distribution by status (β), the proportion of P^os (α), and consolidation - the proportion of P^os that are high-status (x). Variations in any of these parameters can affect diffusion outcomes. Following Blau’s three parameters, I test how variations in (1) size of the elite, (2) homophily, and (3) level of consolidation lead to distinct differential diffusion outcomes using the recursive system outlined in Equations 1-9. Moreover, I demonstrate how different thresholds of adoption and personal network sizes shape those outcomes. I use three thresholds – two, three, and four and four network sizes – four, six, eight, and ten. I use a population of 1,000 agents and, consistent with a small original set

of adopters, an initial adopting fraction of five percent. The analysis can be modified to fit any N and α using the equations delineated above.

Minority High-Status

[Figure 5-2 (about here)]

Figure 5-2 graphically depicts the system for a small elite comprising twenty percent of the population. Of the five percent of initial adopters of the less-institutionalized belief/practice in the whole population, fifty percent are high-status. That is, in accordance with consolidation, the elite population has more than its share of P^0 s. The x-axis shows homophily ranging from zero to one. At a value of zero, networks are not structured by homophily – individuals have no preference to associate with status-similar others. At a value of one, personal networks are completely homophilous – individuals associate only with those similar to them on status. The y-axis shows the ratio of the proportion of high-status to low-status adoption at the point when contagion occurs in at least one of the two groups. I take contagion to mean ninety-nine percent or more adoption. A ratio below one denotes speedier contagion in the low-status, while ratios higher than one indicate faster-paced high-status contagion. Each curve depicts the ratio for a different threshold to network size (m/k) of adoption. The diamond connector curve in Figure 5-2, for example, shows the ratio of the proportion of high-status to low-status adoption when contagion occurs in at least one of the two groups at different levels of homophily if individuals have personal networks of size ten and the adoption threshold is at least three. The curve shows that at a homophily level of forty percent, with twenty percent elite population that initially has fifty percent of the initial adopters,

approximately five percent of the low-status population has adopted by the time one hundred percent of the elite have adopted producing a ratio close to twenty. This large gap is consistent with a case of ‘highly differentiated diffusion,’ a strong basis generating institutionalization for the belief/practice.

Figure 5-2 shows that for a minimally complex threshold that requires at least two network members to be status-similar P^0 s, contagion spreads faster amongst the low-status than high-status at low levels of homophily for all network sizes. The ratio is less than one in this range but not by much, indicative of marginally differentiated diffusion. At homophily levels between 0.3 and 0.4, contagion occurs synchronously in the two groups leading to a balanced ratio. Given the initial conditions in favor of elite adoption, their probability of exposure is usually at least as large as initial low-status probability. Yet, if networks are not highly structured by status-homophily, given the smaller number of elites in the population, networks of the elite are more likely to be composed of non-elites than vice versa. That is, as they comprise a smaller proportion of the population, elites-networks are more likely to be composed of ties that are not useful for transmitting behavior as compared to networks of non-elites. At higher homophily levels, however, the ratio shifts to faster-paced high-status contagion. Higher homophily turns ties inwards on the basis of status-similarity. Consequently, networks are more likely to be composed of ties that are useful signal-bearers for adoption. This increases the probability of adoption for both high- and low-status. But given consolidation, high-status individuals are exposed to a larger number of high-status P^0 s. The curves demonstrate that at higher levels of homophily, consolidation overtakes population distribution effects such that

high-status probability increases more than low-status probability leading to quicker high-status contagion.

Nevertheless, the ratio of high to low adoption remains quite low at all levels of homophily. This is especially true for the 2/10 and 2/8 curves. This is because the probability of at least two of your acquaintances being status-similar P^o s is not insignificant with large personal networks. These probabilities fall progressively as network size decreases – given a pool of P^o s, it is much less likely that at least two of your four associates happen to be status-similar P^o s than two of ten. At the same time, the curves demonstrate that as network size decreases, low-status probability falls faster than high-status leading to increasingly higher ratios at given levels of homophily. Minimally complex thresholds of two in large-sized personal networks are most likely to produce marginally differentiated diffusion in an elite minority irrespective of the level of homophily – not conducive to producing institutionalization of the belief/practice.

Higher adoption thresholds of three and four produce a qualitatively different set of outcomes. The form of the largest network-size of ten with a threshold of three is similar to those obtained at the lower threshold of two. The ratio of high-status to low-status adoption remains below one when homophily is less than ten percent. But the curve splits off from the others and produces a much steeper rise in the ratio at comparatively lower levels of homophily. At forty percent homophily, the curves with thresholds of two produce comparatively balanced diffusion with ratios hovering around one. The 3/10 curve, by comparison, has a ratio of fifteen indicative of a much larger divergence in high- and low-status adoption. The rise in ratio continues as homophily rises but levels off at about twenty-two. At eighty percent homophily and high-status

contagion, low-status adoption is less than five percent. This large difference can produce a protracted period of highly differentiated diffusion creating room for the cognitive association of the belief/practice with elite status eventuating in cultural institutionalization.

The curves change form at smaller-sized networks. Each curve depicts a failure to induce any adoptions in either status below certain levels of homophily - a range of *no take-off*. The homophily level below which this occurs increases with a simultaneous decrease in the network-size and an increase in the threshold value. The level is highest for 3/4, followed by 4/8, 4/10, 3/8, and 3/10. When homophily is below the cut-off levels, the probability that the required number of associations are status-similar P^0 s is too low for both groups. Higher levels of homophily raise the probability for high-status sufficiently to induce further elite adoptions but not enough for additional low-status adoptions. These conditions create a space for *perfectly differentiated diffusion* in equilibrium with contagion in the high-status and no additional adoptions in the low-status. With the exceptions of the 3/8 curve, where still higher homophily induces highly differentiated diffusion, perfectly differentiated diffusion is consistently produced even as homophily increases in all other curves. To the extent that the adoption is contingent upon reinforced influence from multiple network alters, social networks act as an enduring barrier for low-status adoption creating an ideal-typical situation for the alignment of the practice/belief with the high-status group.

At a lower level of consolidation such that forty rather than fifty percent of the initial adopters are elite, the low threshold curves shift downwards towards lower ratios. Moreover, the homophily range of faster-paced low-status contagion is also prolonged

along the homophily axis. Higher threshold values continue to produce perfectly differentiated diffusion at high levels of homophily and no take-off at lower levels, but the minimum homophily levels at which high-status contagion begins to occur, rises.

Thus, in cases of a minority elite such as in socioeconomic class, upper management in an organization, and male supervisors in EPZ garment factories, strong preference for building relations with similar others coupled with higher thresholds of behavioral adoption can aid in institutionalization of the belief/practice.

Majority Elite

[Figure 5-3 (about here)]

Figure 5-3 shows the results of modeling diffusion in a majority elite comprising seventy-five percent of the population with consolidation held constant at 0.85. In contrast to the previous case, the curves depict lower ratios of high-status to low-status diffusion at higher homophily levels. Also unlike the previous case, the ratio is always greater than one indicating that contagion occurs faster within the high-status population at all levels of homophily. When elites make up a large proportion of the population, without searching for similar others, any actor in the population is probabilistically more likely to be tied to a high-status person. Consequently, if homophily is low – hence low-status individuals are not preferentially attached to others with lower status - their networks are more likely to be composed of high-status individuals. Consequently, at low levels of homophily, low-status individuals are at a considerable disadvantage with respect to receiving effective signals from other low-status persons. High-status individuals, on the other hand, are much more likely to receive such signals both due to

consolidation and due to relative size. This explains why, at low levels of homophily, all thresholds and network sizes produce perfectly differentiated diffusion.

If networks are more homophilous, the likelihood of adoption is higher for actors in both groups as ties turn inwards towards signals that are effective for behavioral transmission. Despite consolidation, low-status likelihood rises faster than high-status likelihood as homophily increases because of the group's smaller size. Amongst the minimally complex threshold curves (requiring the presence of two or more P^o s in networks), this shift in probabilities produces rapid drops in the ratios. These turning-points occur at higher levels of homophily and settle at higher levels of the ratio with smaller-sized networks. Thus, combinations of low homophily and small-sized networks with minimally complex thresholds of adoption yield perfectly or highly differentiated diffusion creating conditions suitable for institutionalization.

Higher adoption thresholds yield conditions suitable for inducing perfectly differentiated diffusion. Curves for higher-valued thresholds depicted as $3/10$, $3/8$, and $3/6$ in the figure demonstrate this outcome. The shift in probability observed in the lower threshold value of two does not occur in this case – it appears that consolidation overwhelms the effect of population distribution when adoption thresholds are higher. Even though ties turn inwards towards actors similar in status and hence effective signal-bearers, consolidation implies that there are too few of the latter in the low-status to effect contagion at higher thresholds of adoption.

Higher levels of consolidation with the high-status shift the minimally complex threshold curves to the right so that turning points at which ratios fall below perfectly differentiated diffusion levels occur later and culminate in higher values.

Thus, in the case of a high-status majority, as long as behavioral adoption is contingent upon receiving multiple, reaffirming signals from networks members perceived to be similar to oneself, institutionalization of the belief/practice can occur even at low levels of observed homophily in social networks.

Evenly Divided Population

[Figure 5-4 (about here)]

Figure 5-4 presents the curves for an equally divided high- and low-status population with consolidation held constant at 0.7. At the lower adoption threshold of two, the ratio zigzags around a constant value across homophily-levels. This constant value is higher at smaller-sized networks. As the population is equally divided between the two groups, consolidation is more important than homophily in producing variations in the low- and high-status probabilities of adoption. Homophily is not irrelevant because higher levels produce more homogeneous networks that are effective for adoption. But, in the absence of a skewed population distribution analyzed in previous cases, the increase in probability of adoption attributable to higher homophily is equal across the two groups. This is because, in the absence of preferential attachment to similar others, networks are likely to be composed equally of high- and low-status individuals. Consequently, the only behavioral adoption advantage accruing to high-status actors is consolidation. The size effects according additional probability of adoption to the larger-sized group at low levels

of homophily is missing in the case of even-sized groups. The discrepancy in adoption rates evident in the ratios thus isolates the persistent effect of consolidation.

Much like the majority elite case, smaller network-sizes and higher thresholds comprising three or four ties produce a mixture of no take-off, perfectly differentiated diffusion, and highly differentiated diffusion. Curves labeled 2/4 and 3/10 depict a similar case of perfectly differentiated diffusion with a turning point after which ratios drop considerably but stabilize at levels consistent with highly differentiated diffusion. All other higher thresholds and smaller-sized networks depict regions of no take-off at lower levels of homophily and perfectly differentiated diffusion at higher levels. An increase in the consolidation shifts curves to the right and upwards towards higher ratios. Gender, the classically demographically evenly divided yet ordered attribute, is an appropriate example here. Networks, however, are often not highly homophilous along gender (McPherson et al. 2001). The analysis suggests that, even in the absence of homophily, given sufficient initial consolidation and crucially, greater value placed on information received from gender-similar alters, institutionalization of an initially less-institutionalized belief/practice can result via the proposed mechanism.

Conclusion

In this chapter, I propose a mechanism to show how an initially less-institutionalized belief/practice can acquire cultural value as a result of being strongly and visibly associated with some groups and not others. Disjointed social networks and initial uncertainty of practices/beliefs are the two key determinants in this mechanism. In particular, I find that the likelihood of the belief/practice diffusing highly differentially

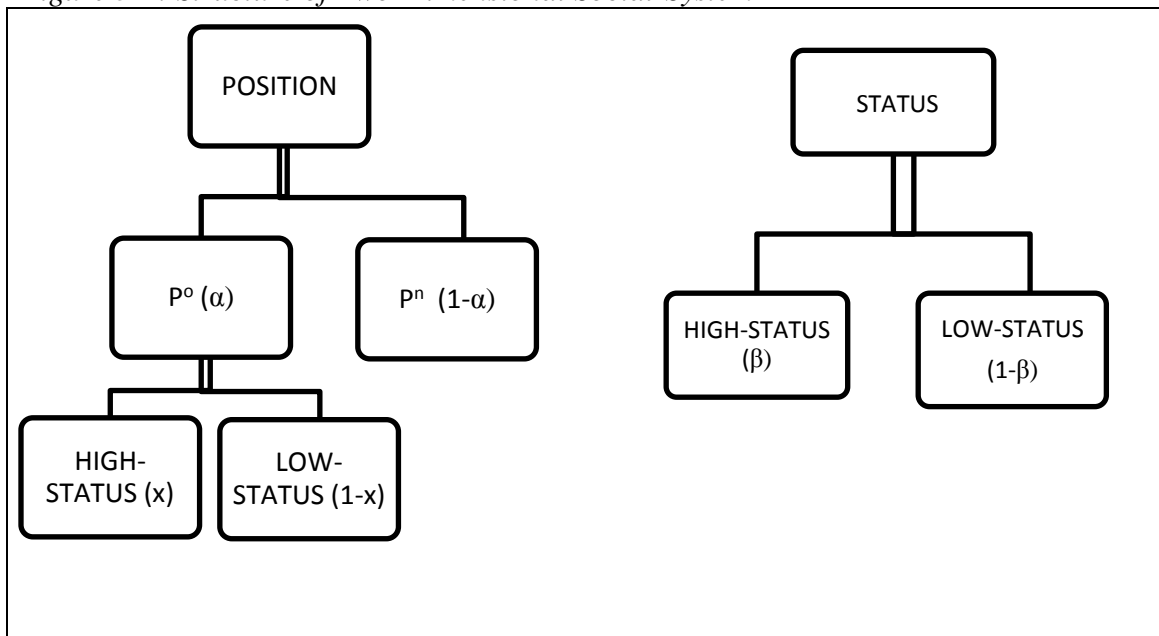
across groups is uniformly higher with smaller-sized networks or higher thresholds of adoption. Given Blau's emphasis on consolidation and population distribution effects, I find the effects of initial consolidation in producing institutionalization are moderated by the level of homophily. Initial consolidation is less effective in aligning the belief/practice with group differences at low levels of homophily. Population distribution is more crucial at this stage. Higher levels of homophily, in contrast, simultaneously activate consolidation effects and mitigate population distribution effects. This produces different outcomes depending on the size of the elite. A minority elite needs high levels of homophily to effect institutionalization. In a majority elite, on the other hand, cultural institutionalization on the mechanism outlined here is most likely when homophily is lower. Homophily is least important in a population that is divided into two equal-sized groups like gender.

The analysis above also indicates that in addition to thresholds and social network structure, as argued in previous research, social-systemic factors are important determinants of differential diffusion outcomes. Network and threshold analyses suggest that differential diffusion across groups will occur either if network structures differ across groups (say, the presence of dense networks and wide bridges amongst high-status and sparse networks and narrow bridges amongst low-status), or with disparate thresholds of adoption (high-status have lower thresholds than low-status). The analyses presented here indicate that differential diffusion may occur even if network structures and adoption thresholds are similar across groups given suitable social-systemic conditions. The interaction of social-systemic structure, social network structure, and threshold forms to produce differential diffusion across groups therefore suggests that empirical and

experimental analyses of diffusion also need to be sensitive to factors such as degree of homophily, distribution of population groups, and levels of consolidation between groups. It is important to note, however, that even when the conditions are suitable, this mechanism is not a set of sufficient conditions resulting in institutionalization. Social reality may diverge from these findings based on a mathematical model due to random chance events, the interleaving and messiness of cultural symbols across groups, faddish rejection, network structural effects, or long time spans. Despite the simplicity of the model, however, it delineates an intriguing social mechanism that can be modified to account for additional parameters and complexities and tested using empirical data.

In summary, I have used this chapter to develop a schematic model to show how practices and cognition that arise in less-institutionalized situations may diffuse at different rates across relatively disjointed networks. Such uneven spread can produce cultural institutionalization of the behavior by aligning it with existing group differences. This model can be used to show, for example, how different sets of practices and interpretive schemas may come to characterize distinct groups of women garment workers on the basis of class or religious affiliations. Likewise, greater interaction with scholars working within one's own geographical region and greater exposure to that literature within regions, as demonstrated in Chapter 4, may lead to the reliance on distinct sets of exemplars and divergent research focuses.

Figure 5-1: Structure of Two-Dimensional Social-System



(proportions in parentheses)

Tables 5-1(a-d): Illustration of Blau's Consolidation and Intersection of Attributes

Table 5-1a: S and P are intersecting attributes

	$S^h(\beta)$	$S^l(1-\beta)$	
$P^o(\alpha)$	0.06	0.24	0.30
$P^n(1-\alpha)$	0.14	0.56	0.70
	0.20	0.80	1.0

Table 5-1b: Probabilities of intersecting S and P

	$S^h(\beta)$	$S^l(1-\beta)$	
$P^o(\alpha)$	$\alpha\beta$	$\alpha(1-\beta)$	α
$P^n(1-\alpha)$	$\beta(1-\alpha)$	$(1-\beta)(1-\alpha)$	$(1-\alpha)$
	β	$(1-\beta)$	1.0

Table 5-1c: S and P are consolidated attributes.

	$S^h(\beta)$	$S^l(1-\beta)$	
$P^o(\alpha)$	0.12	0.18	0.30
$P^n(1-\alpha)$	0.08	0.62	0.70
	0.20	0.80	1.0

Table 5-1d: Generic probabilities of consolidated S and P

	$S^h(\beta)$	$S^l(1-\beta)$	
$P^o(\alpha)$	$x\alpha$	$\alpha(1-x)$	α
$P^n(1-\alpha)$	$(\beta-x\alpha)$	$(1-\beta)-\alpha(1-x)$	$(1-\alpha)$
	β	$(1-\beta)$	1.0

Figure 5-2: Minority Elite Differential Diffusion

Curves depicting the relationship between homophily and ratio of high-status to low-status proportion of diffusion when at least one group achieves contagion (> 99 percent diffusion) for a minority elite (twenty percent) and different thresholds and personal network sizes.

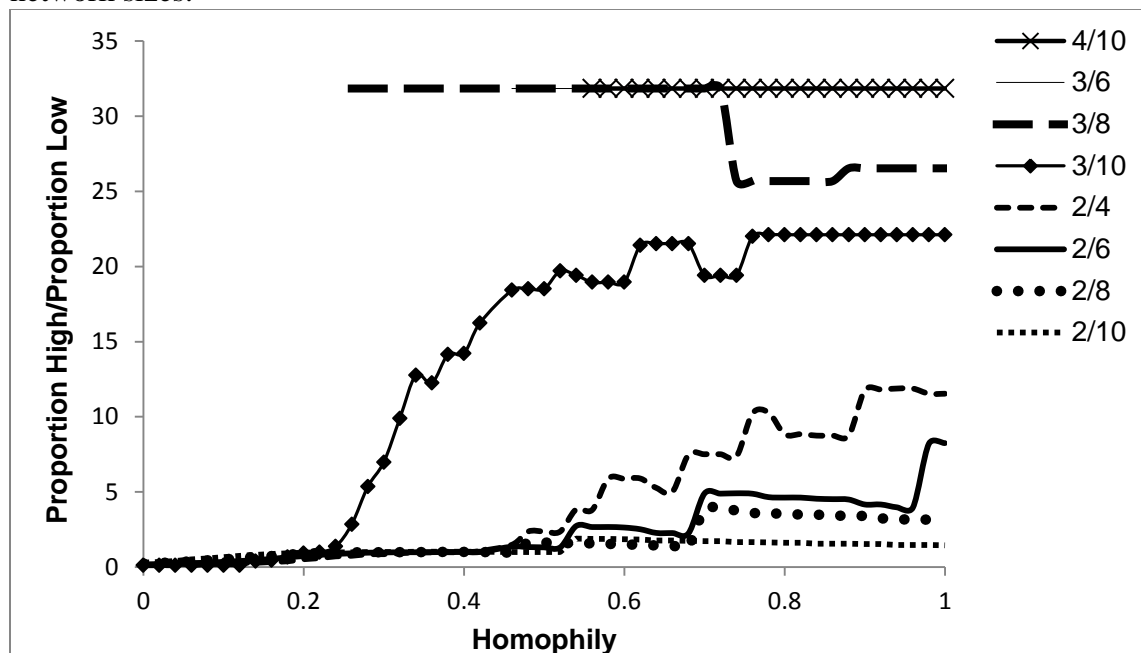


Figure 5-3: Majority Elite Differential Diffusion

Curves depicting the relationship between homophily and ratio of high-status to low-status proportion of diffusion when at least one group achieves contagion (> 99 percent diffusion) for a majority elite (seventy-five percent) and different thresholds and personal network sizes.

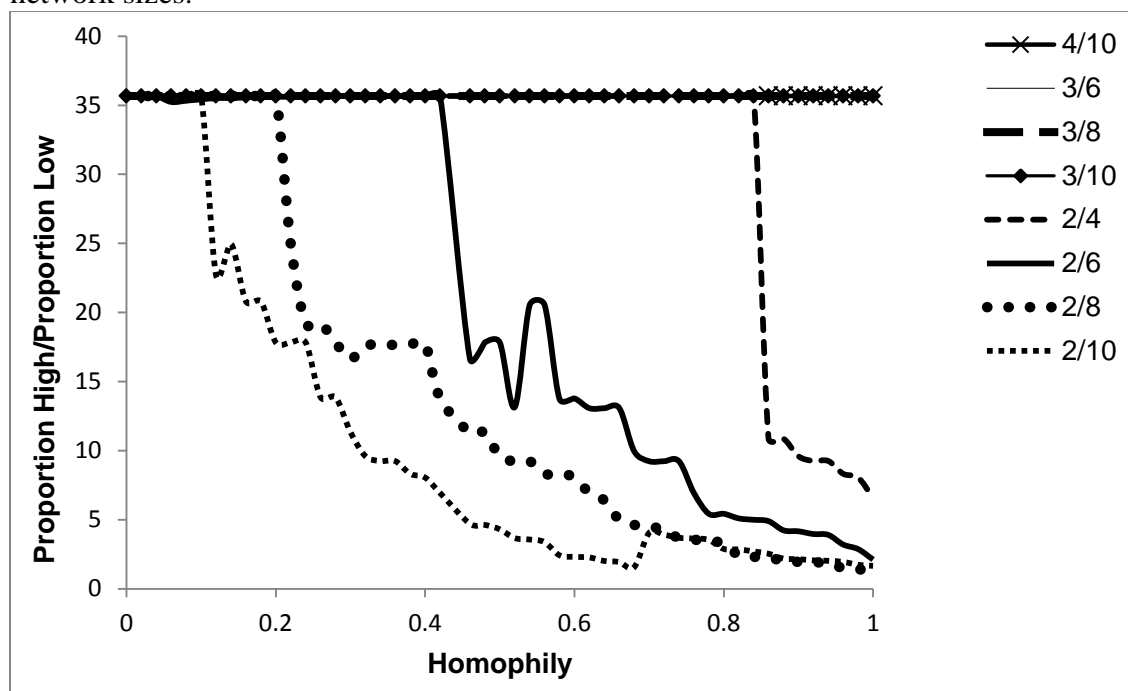
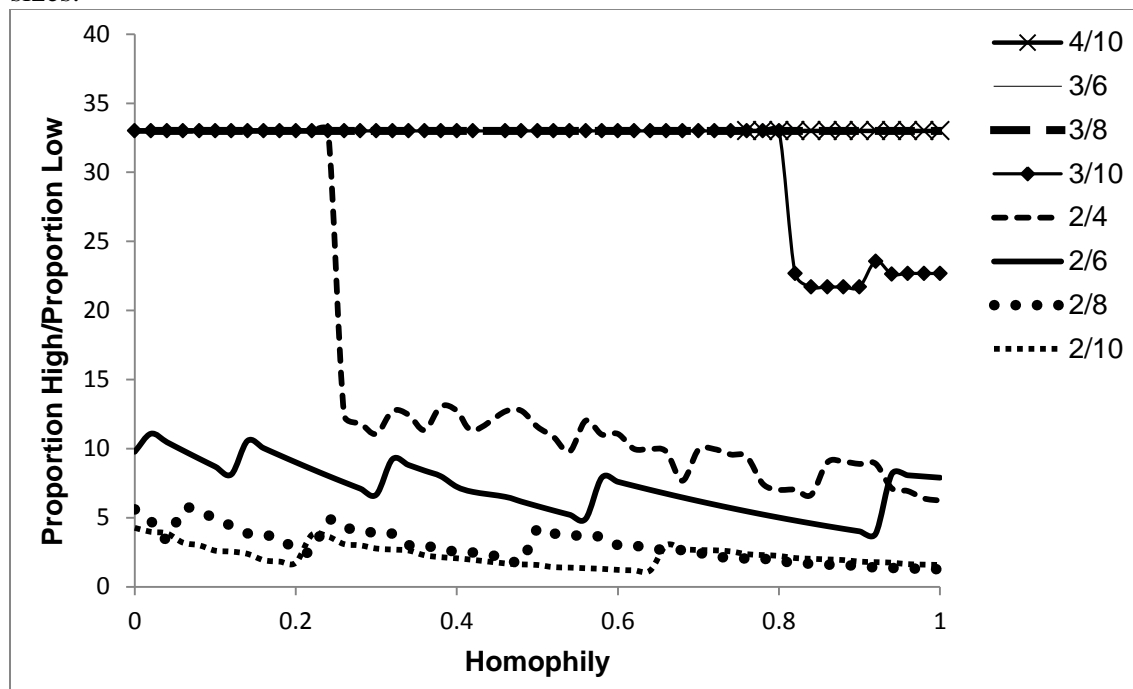


Figure 5-4: Equal-Sized status-groups Differential Diffusion

Curves depicting the relationship between homophily and ratio of high-status to low-status proportion of diffusion when at least one group achieves contagion (> 99 percent diffusion) for fifty percent elite group and different thresholds and personal network sizes.



Chapter 6: Conclusion: The Co-Constitution of Individual and Positional Repertoires

Summary of Findings

My primary aim in this dissertation has been to shift the focus of attention to culturally emergent and/or non-meaningful situations in order to study *how* culture is, nevertheless, implicated in the production of regularities in such social structures. Towards this goal, I have theorized and developed ‘less-institutionalized positions’ as a form of social organization that is characterized by situationally-cued relational regularities but *not* by situationally-cued cultural ones. Moreover, I argue that less-institutionalized positions are associated with variable levels of uncertainty ranging from high to low. In the absence of situational cultural cues, it is tempting to conclude that forms of situational relational ones including structurally deterministic tendencies that preclude subjective engagement and cultural context (cf. Emirbayer and Goodwin 1994) and/or structural heuristics that entail subjective engagement but exclude shared understandings (Martin 2009) alone are the dominant driving forces of social order. While acknowledging the importance of such structural factors, my general claim is that in less-institutionalized positions, order can also be traced to individuals’ tacit and discursive use of their cultural repertoires that they have acquired over a life-course through involvements in multiple networks of interaction and domains of shared meanings or ‘netdoms’ (White 2008a).

I have used three examples from diverse spheres of social life and three distinct methodological techniques to demonstrate my arguments. The example first pertains to

the large-scale employment of women in garment manufacturing units located in export processing zones in South Asia facilitating the “almost overnight creation of a first generation of female factory workers” (Kabeer 2004: 14). This historically and culturally unprecedented mass movement of women from the invisible private to the public domain and concomitant generation of new sets of employment and urban relations as well as income imposed high levels of uncertainty in interpretation and action for all those involved. In this environment of heightened ambiguity, I use interpretive techniques to briefly analyze how South Asian garment manufacturing workers respond to such uncertainty. The analysis illustrates the use of analogizing and contrasting techniques as implicated actors discursively draw upon fragments of cultural knowledge acquired in diverse realms including kinship, gender, and domestic employment to interpret their novel experiences. For my second example, I switch to the other end of the uncertainty spectrum to analyze sibship-size as a type of less-institutionalized social structural position that does not typically generate ambiguity for its occupants. I analyze the effect of sibship-size on support network composition in an environment of worldwide fertility decline, implying that the world over, people have fewer siblings, on average. A fundamental structural effect of having fewer siblings is that people have a smaller pool of familial ties with whom to construct support networks. Unlike siblinghood, however, the number of siblings an individual has is not culturally connotative. Consequently, after controlling for individual and group-level effects, one should expect sibship-size to generate structural but not cultural regularities. Using multilevel statistical models on a cross-national dataset, however, I find that the structural effects of sibship-size on network composition are moderated by individuals’ implicit understanding of the

institutionalized cultural content of a variety of role-relationships. Thus, rather than discursively, as in the previous case, culture is implicated in individuals' choices of network alters tacitly through spillovers.

My third example from the field of knowledge production lies somewhere in the middle-range of the uncertainty axis. As compared to mature areas of research, an emerging area is characterized by ambiguity attributable to unpredictability and lack of routinization in the field. Using Exponential Random Graph Models, a novel network statistical tool, I show that in a bid to cope with such uncertainty, authors publishing in the field cite eclectically by drawing on diverse research areas and regions of specialization in which they individually have familiarity and expertise. In the aggregate, this yields a diffusely connected research field that welds together disparate traditions and geographical regions of knowledge production. At the same time, I find that uncertainty also creates a small but dense region of centralization as authors cite a core set of exemplars almost as a matter of necessity. This type of 'compulsory' citing does not take much deliberation and can be treated as tacit knowledge. To summarize, my three examples show that variations in uncertainty associated with the absence of situational cultural cues in less-institutionalized positions lead occupants to invoke their toolkits in distinct ways: heightened uncertainty leads to discursive employment of cultural repertoires, low levels of uncertainty to tacit usage, and middling levels to a combination of tacit and deliberative utilization.

This recombination of diverse cultural repertoires and structural tendencies of the less-institutionalized position also has the potential to generate social change. The provision of dowry in South Asia, for example, is traditionally the responsibility of

parents; not of daughters. Yet, unmarried women from lower-income households allocate income earned from garment work towards dowry. Greater agency accorded by an independently earned income alongside traditional expectations of dowry produces a novel outcome that has the potential to improve the status of women as well as their prospects on the marital market. In the case of Chapter 4's research field in its nascent stages, authors draw upon a core set of ideas mostly developed by scholars studying a similar case in a temporally preceding and geographically distinct area. Yet, authors also invoke more diverse bodies of literatures that have a bearing on the local conditions they study. In this process of innovation, they manage to create a new field of research that, in its current developing stage is simultaneously eclectic and centralized. Towards the end of Chapter 4, I described two different trajectories the field could take as the research area becomes more mature involving either continued reliance on a smaller-sized core or pluralistic splitting into more specialized domains. Lastly, in Chapter 3, on the basis of my findings, I argue that continued declines in fertility could bring about changes in the roles played by key relations including parents and friends. Less-institutionalized positions, thus, are also analytically useful for investigating the emergence of novelty and new social orders.

Cultural Institutionalization: The Duality of Individual and Positional Toolkits

Towards the end of Chapter 2, I argued that much like the case of individuals, it is useful to think of positions as 'having' cultural repertoires. Individuals acquire cultural toolkits – skills, habits, perceptions, and styles - by virtue of memberships in collectivities. Highly-institutionalized positions like roles, likewise, have associated with them a core set of rights, duties, or ways of acting that are part of shared knowledge.

They also have a broader set of action and cognition sequences that may not be modal but are nevertheless part of the distribution of behaviors associated with the role. We can think of this set of action and cognition ‘units’ as part of the role’s repertoire that are available for occupants’ use. Contemporary sociological theory’s emphasis on the situatedness of culture implies that when individuals enter a role, their behavior is considerably channeled by role-definition but they nevertheless have some options as to what aspect of the role they draw upon and perform. To the extent actors are skilled users of their own cultural repertoires, they are also skilled users of the repertoire of available choices within a role-definition. The existence of choice implies that positional toolkits are also constituted by the individuals who occupy them. This argument suggests a co-constitutive relationship between positional and individual toolkits – individuals acquire repertoires by virtue of their positions in diverse collectivities and positional repertoires are developed, sustained, and refined by virtue of their occupants’ cultural toolkits.

By its very definition a less-institutionalized position, by contrast, lacks such a well-formed cultural toolkit. There were no set, known ways of being a factory employee as a woman in Bangladesh in the nineties; barring few canons of the literature, scholars studying these women have to draw on a diverse body of eclectic sources to successfully publish in the field; and while those of us who have siblings are generally aware of the rights and responsibilities that accompany that role, we generally don’t carry around notions of being a two or three sibling in our heads. Despite the absence of a toolkit associated with the specific less-institutionalized position, their *occupants* do have cultural repertoires that they, in turn, have acquired by occupying roles in various collectivities or netdoms. And, it is fragments of these very repertoires that such

individuals bring to bear, tacitly or discursively, to construct order in less-institutionalized positions. Thus, if a less-institutionalized position is to become culturally institutionalized over time, it is likely that its repertoire would be constituted through those very same fragments. In the case of emergent research characterized by intermediate uncertainty, such a repertoire might consist of a broader set of consensually held concepts and exemplars that anchor the field and give it a more pronounced identity. New entrants that are subsequently socialized into this field will come to attribute legitimacy to those concepts and canons. In the case of women workers, the position may transform into a role with a stable set of practices and vocabulary based on the multiple class, gender, and kinship-based perspectives that occupants use to construct frames of interpretation and strategies of action.

Yet, the emergence of positional repertoires from the congealment of individual toolkits or, equivalently, cultural institutionalization in the case of less-institutionalized positions may not be a straightforward process. Institutionalization occurs when the *common but not as yet shared* understandings of occupants become shared, exterior, and objective (Berger and Luckmann 1967, Jepperson 1991). The process by which some practices and understandings become constituent elements of the toolkit while others are discarded has been the subject of considerable research. Literature in symbolic interactionism and social networks, for example, suggests that meanings are constructed in interaction within groups and networks of ties (e.g. Fine and Kleinman 1983, White 2008a). Even though actors may draw on somewhat distinct fragments to deal with the uncertainty generated by the less-institutionalized position, some features may gain credibility in conversation with others experiencing the same or similar situation.

Conversation and interactions and the ensuing “reflection, reporting, and updating” (Mische 2011:82) leads to convergence on some features and not others. More generally, Godart and White (2010) contend that subjective experiences coalesce into scripts via the suppression of idiosyncrasies and the expression of commonalities. The creation of such scripts, however, needs some shared platform where individuals can give voice to their common experiences. ‘Publics’ are interstitial social spaces where people come together for short periods of time (Mische and White 1998). Publics function by limiting the complex of other roles, identities, and memberships that each actor brings to the space. This ‘stripping’ down implies that participants can more easily find common ground through interaction and conversation.

The model I developed in Chapter 5 is consistent with the notion of publics. Reduction of the complex of identities implies that some specific ones, such as class-based affinities, may acquire greater salience. This affinity can become a basis for trust and, consequently, sharing of uncertain information in small-group settings can lead to the creation of consensus on some practice or belief within the group. This is because uncertainty implies that thresholds for attributing validity to someone else’s experiences and suggestion will be higher. At the same time, uncertainty also implies that information from others perceived similar to oneself is likely to be viewed as more credible. To the extent a few people who are similar on a salient attribute share resonant experiences, they might be able to convince others in the group that their perceptions and practices are valid. This initial ‘seed’ of consensus may diffuse more widely through other overlapping publics or networks of interaction. In the example of feminization of the labor force used above, examples of publics are lunch hours and shared housing facilities where women

can share their common experiences. Even if the women individually draw on diverse roles (domestic servant, agriculture, gendered identities, etc.) to make sense of being garment workers, the sharing of stories within homogeneous networks or publics can lead to the cultural institutionalization of the position. The mechanism outlined in Chapter 5, however, applies largely to circumstances where, while less-institutionalized, the position is, part of the vocabulary and people are sensitive to its existence. This mixture of lack of institutionalization and awareness is what creates ambiguity but also facilitates discussion and sharing of those uncertain experiences as they relate to the position. The existence of some element of uncertainty, therefore, implies that a path towards cultural institutionalization ‘from below’ through sensitivity to ambiguity and entailed subjective engagement is possible.

The absence of awareness and conscious engagement, in contrast, implies that other types of less institutionalized positions, such as sibship-size, have the potential to remain *durably* less-institutionalized. While the question of what kinds of positions eventually acquire cultural toolkits and which ones have the potential to remain less-institutionalized merits fuller analysis in the future, my arguments above suggest that cultural crystallization from below (rather than through top-down) requires four conditions. One, at the most basic level, the position must occur with sufficient regularity. That is, the circumstances (political, demographic, cultural, and/or social) responsible for creating the less-institutionalized position must ensure the production of the position. Two, behavior in less-institutionalized positions must come to be organized in some way. I have highlighted the role played by culture acquired in other netdoms in producing those regularities. But, other sources of organization including structural

tendencies, and instrumentally and/or ecologically rational behavior amongst others may also contribute towards producing order. Three, actors must be aware of being occupants of a less-institutionalized position so that discursive engagement is possible. While EPZ workers and researchers fit that requirement, sibship-size does not. In the case of positions that fail to fit this criterion, institutionalization entails an additional condition: processes of knowledge-production that generate greater awareness leading positions to shift rightwards along the scale in Figure 1-1 towards higher degrees of uncertainty.

Navon (2011), for example, argues that identification of genetic markers or mutations can create new socially salient categories of people setting in motion networks of scientific and social action; the genetic designation gradually acquiring cultural meaning through knowledge production. Four, as I elaborated above, institutionalization requires platforms and other conditions suitable for common experiences to become shared, objective, and exterior.

Closing Statement

Historically, structural explanations that either bracket cultural context and subjective engagement or treat it as irrelevant have dominated the discourse in social network analysis. Although others (for example, Emirbayer and Goodwin 1994, Mische 2011, Pachucki and Breiger 2010) have written more comprehensively on the need to account for cultural forces in social network analysis, the concept of less-institutionalized positions raises several new and interesting questions: how do occupants respond to being in culturally ambiguous yet relationally structured locations; despite the absence of coupled cultural logics, how does culture matter for producing regularities in less-institutionalized positions; what novel cultural outcomes are produced in such situations;

and, under what circumstances do such locations remain durably less-institutionalized and when do they evolve into culturally meaningful categories; and what processes are entailed in the production of such institutionalization? In raising and responding to these questions, my dissertation contributes to that literature in both general and specific ways. Generally, I have developed an umbrella concept bringing together tacit spillover interaction effects between structural contingencies and cultural rules from other spheres as well as uncertainty-inducing social locations that are resolved through deliberative processes. In fact, the concept can also be utilized to think about the practical and discursive bases of other types of statistical interaction effects within the field of sociology. Moreover, the approach I have outlined can be utilized to study a variety of social units including positions, ambiguous social contexts, as well as relations whose content is uncertain (e.g., Gondal and McLean 2013). That said, not all network structural locations are culturally less-institutionalized and, consequently, the concept resonates more with specific types of social network studies. The notion of less-institutionalized positions is particularly useful when dealing with issues of emergence and novelty not only for showing *that* culture matters for organizing action and perception but also *how* it does.

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