Implications for a Public Participation Geographic Information Science: Analyzing Trends in Research and Practice

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Abstract

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Exploration of the implications for a public participation geographic information science (PPGISc) should constitute PPGISc in ways that allow the discipline to continue to interrogate the underlying theoretical assumptions of both research and practice. Here, I offer two approaches to this sort of interrogation: a discourse analysis of a recent, edited collection cited by those engaging in PPGISc research, and a critically engaged comparison of methods of structured participation to inform system development. The edited collection, *Community Participation and GIS* (CPGIS) by Craig, Harris, and Weiner (2002), represents a snapshot of research trends in PPGISc and continues to be cited within PPGISc research to legitimate the practice of community involvement in GIS-supported, group decision-making. The numerous case studies within CPGIS are offered largely lacking explicit theoretical framing, which potentially exposes a simplistic notion of 'community' as the core of a theory of participation. This paper argues that this edited collection represents a paradigm situated in particular theoretical assumptions about democracy, community, and the citizen-individual-participant. An attempt is made here to unpack the assumptions

made by the authors in this edited collection, by examining the way each portrays the activities of a participant in a GIS-supported, decision-making context. Additionally, the practice of a PPGISc is enabled through a notion of participation that is supported through particular procedures and thereby 'structured' in certain ways. Within planning and management circles participation has been structured by using many mainstream methods, as well as hybrid versions (specialized to be relevant for particular situations). The extent to which these methods of participation might support the practice of PPGISc is largely unknown. As such, five methods of participation are examined in this paper, each exhibiting different procedures for structuring participation: nominal group technique, Delphi process, technology of participation, open space technology, and citizen panel/jury. The way in which these sets of procedures (methods) provide an organized structure for a decision-making public brings about complexity in realizing normative assumptions about the role of 'power' in a political process. The use of such methods to structure the collection of public concerns in a public participation geographic information system (PPGIS) could enhance the public's experience in decision-making processes; however, unpacking the limitations for systematizing participation within particular notions of political power is necessary for system design. These potential limitations are explored through a comparison of these five methods for structuring participation, while confronting a notion of multiple dimensions of 'power'.

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I am indebted to my fellow PGIST project team members, who have provided such intellectual excitement for this thesis. Special thanks to Jeffrey Masse, Annie Bartos, Kevin Ramsey, and Erica Sieben who provided comments on drafts of these papers, and whose support and enthusiasm I continue to enjoy. I must also thank Lynn Staeheli, Sarah Elwood, and Meghan Cope for their advice during this project. I would be remiss to not acknowledge the support by National Science Foundation Grant No. EIA 0325916, funded through the Information Technology Research Program, and managed in the Digital Government Program.

Dedication

To my parents and grandparents,
especially “Charlie”
whose love of the argument around the dinner table
warmly lingers in memory.

Introduction

> The GIS in which technical rationality dominates so thoroughly now must give way to a science of GIS: the scholarly investigation of its origins, logics, systems, new capacities, and new uses. (Pickles 1997: 369)

Interestingly, ten years after John Pickles (1995) offered a collection of articles in *Ground Truth: The social implications of geographic information systems* which has shaped the debate of a growing discipline, the argument reiterated above remains as pertinent to current trends in so-called "critical GIS" as the original context in which the edited collection emerged. Just as those engaged in geographic information science continue to worry their assumptions in research and practice, a public participation geographic information science (PPGISc) should continue to question what work is being performed by adding "public participation" to the identifier for all sorts of questions of participation and representation[1]. What is meant by 'public'? How are we inscribing particular norms of 'participation' within the practice of PPGISc? By placing these kinds of questions in theoretical footing such as political theory and feminist theory, significant opportunity exists for heeding the original call made by *Ground Truth*, in continued (re)articulation of our various projects' theoretical underpinnings. The consequences for ignoring this kind of interrogation is paramount, and would certainly result in a weakening of the discipline, or at least

[1] As Aitken and Michel (1995) suggest, the definition of 'public participation' is implicated in social and political contexts, and that traditional definitions of GIS have often emphasized an "artificial separation of people, society, and technology" (18). Therefore, the exercise to continually define and redefine what is meant by 'public participation' is worthwhile, as it provides the appropriate context for better understanding the implications of its use.

theoretical fragmentation. As Pickles states in the introductory quote, the notion of GIS as a purely technical pursuit must be continually called into question, begging us to be mindful of the argument that *Ground Truth* represents.

GIS, through this burgeoning and somewhat indiscriminate interrogation, has many identities, as Nadine Schuurman (2004) writes in her introductory text about GIS. She outlines three areas of research and practice for GIS positioned in relationship with human geography, including critical GIS, feminism and GIS, and public participation geographic information systems (PPGIS). While the interest of this thesis is that of the PPGIS identity of GIS studies, I am an advocate for a PPGISc which draws on political and feminist theory, largely confronting issues in critical GIS and feminism and GIS. Here, I interrogate notions of 'community' in a recent, edited collection representing current trends in the research and practice of PPGISc, through discourse analysis. In a second section, I compare methods of structured participation to demonstrate the way a simplistic notion of political power is implicit within popular methods of participation for decision-making situations. I attempt to call attention to a particular identity of GIS through interrogation informed by a political rationality. In particular, political rationality is envisioned through a feminist political geography agenda focusing on the situatedness of all knowledges, critiquing ways the political is normalized by emphasizing the distribution (largely uneven) of political power, the antagonism of the political, and the constitutive quality of the political (cf. Brown and Staeheli 2003; Staeheli and Kofman 2004). Each of these realms could be used to destabilize a technically rationalized identity of GIS; however, I focus on the

constitutive quality of the political as a perspective for unpacking theoretical underpinnings in each section of this study.

Constitutive, here, refers to inquiry situated in a political rationality, offered by Elkin (1985), where political processes are seen as continuing activities where citizens relate to one another, and political institutions are ends, not seen as efficiently attending to an outcome yet unrealized. Therefore, in a constitutive sense, PPGISc should be concerned with these activities of citizens relating to one another. Brown and Staeheli (2003: 252-253) describe how this constitutive approach informs a feminist political geography, emphasizing "the contingencies of political struggle, its outcomes, and its implications." In this thesis, I look for instances in which a simplistic notion of 'community' implicitly assumes a quantitative notion of 'power', culled through discourse analysis, emerging from a comparison of methods of structured participation, as a strategy to begin to question the implications, outcomes, and contingencies of a theoretical project framed in this way.

Following a rigorous research design, I argue for a PPGISc which articulates a balance between the theoretical, methodological, and the substantive domains of research to assist in unpacking this particular identity of GIS. The discipline of PPGISc and its distinction from PPGIS can be described using these three domains or research perspectives which comprise a validity network schema, articulated by Brinberg and McGrath (1985). The validity network schema is used to articulate a research process and the relationships that form a logical construction of validity that is "relative to purposes and circumstances." (Brinberg and McGrath 1985: 13)

Therefore, validity in this research is entirely dependent upon the focus of the research. Often information technology studies focus on developing new technological methods with which to study the occurrence of phenomena. Alternately, society and technology studies focus on the societal implications of not only the development, but most importantly the usage of those technologies, by using methods of social science, implicated in particular social theories. The distinction in research perspective allows for a more thorough and well-rounded topic exploration, especially as applied to the growing discipline of PPGISc. Therefore the exchange of ideas among society and technology studies and information technology studies culminates in sub-fields such as PPGISc.

Before PPGISc research can really begin to approach questions of what is meant by 'public' and 'participation', we must first come to grips with our own assumptions about the 'political' and 'power' certainly implicated in our semantic variations of 'public participation GIS' or 'participatory GIS' or even 'community GIS'. By examining the discourse we (re)produce within the discipline, we stand a better chance of attending to the political struggles of everyday life. I intend to engage or reengage with that discussion now.

Designing PPGIS with 'community' in mind: an analysis of trends in PPGISc

> It is clear from the volume that PPGIS is inductive and narrowly focused – the theoretical framing and wider context is missing in many of the papers. … Hasn't the time come when PPGIS researchers will start to conduct their projects within wider frameworks… (Haklay 2003: 320)

A public participation geographic information science (PPGISc) should be concerned with the notion of 'public participation' as much as concern exists for the development of alternative GIS technologies. The Participatory Geographic Information System for Transportation (PGIST) project at the University of Washington represents one such research endeavor that attempts to find a balance for using alternative GIS technologies to support "meaningful participation" in transportation decision-making in the Puget Sound region. This dilemma of providing "meaningful participation" in transportation decision-making for large groups of people is well situated within the research domain of PPGISc: developing new systems where participants are empowered to contribute to a decision-making process while analyzing the social implications of such a development. However, Webler (1999) proposes that the lack of a comprehensive academic perspective in PPGISc, whereby practice informs theory and theory informs practice, limits the development of the discipline and adds to theoretical fragmentation.

This theoretical fragmentation is exhibited in an edited collection, *Community Participation and Geographic Information Systems* (referred to herein as CPGIS), by Craig, Harris, and Weiner (2002). By analyzing the way in which a recent, popularly

cited text formulates a discourse about 'public participation', this paper attempts to posit that a conceptual notion of 'public participation' is rather underdeveloped within much of PPGISc research. A need exists to further investigate 'public participation', as realized by a number of researchers in PPGISc, and realize the potential of a broader contribution that PPGISc may have to offer political geography and vice versa. The time has certainly come, as Haklay writes in the introductory quote, for researchers dedicated to PPGISc to begin to position their work within a broader theoretical context.

However, this move should not be seen as a hindrance to the development of a PPGIS. Following the research strategy of a validity network schema, discussed in the previous chapter, the research and development by the PGIST project of an Internet portal to support public participation in transportation decision-making, incorporates a balance of system research and development with theoretical inquiry, rendering explicit the assumptions implicated in a participatory and democratic process. The examination of this key PPGISc text forms a process of theoretical inquiry which shall be discussed in this chapter in two sections: 1.) the analysis of a discourse formulation through a recent and well cited PPGISc text, and 2.) the introduction of potential research agendas in PPGISc which explore particular understandings of participation.

The importance of a discourse analysis of CPGIS, lies in the intertextuality of the edited collection. The substantial text contains 28 chapters by 46 contributors, representing disciplines in urban studies and planning, geography, forestry, and anthropology as well as practitioners in the broader GIS community. Intertextuality

refers to the meaning making which occurs between and through texts (Rose 2001: 136). Intertextuality articulates the process of producing discourse, here defined as a system or possibility of meaning. Rose depicts this process of reading a text for intertextuality, as composed of an analysis of the "structure of the discursive statements", the consideration of the "social context of those statements", and the importance of audiencing, or the (re)negotiation of meaning by those who read and respond to a particular text (Rose 2001: 25, 136). Therefore, the methods taken to perform this discourse analysis of CPGIS includes a critical reading of the text and the examination of academic texts that cite CPGIS, with the acknowledgment of the gaze of the analyst that looks to describe emerging themes in this particular discursive formulation.

The text

> But there is a negative work to be carried out first: we must rid ourselves of a whole mass of notions, each of which, in its own way, diversifies the theme of continuity. (Foucault 1972: 21)

To cast this research in a negative light as a pursuit of academic deconstruction, as Foucault describes in the above quote from *The Archaeology of Knowledge*, would be only partially appropriate. This paper attempts to unpack the production of discourse within CPGIS, through a positioning of meaning-making as the object of study. The way in which the contributors in CPGIS describe a participant within GIS-supported, collaborative decision-making prescribes meaning to particular assumptions about

democracy, community, and the citizen-individual-participant[2]. These assumptions should be brought into the realm of study, likened to a process Foucault describes where we "rid ourselves" of notions, the result being that we are made more aware of the work that these assumptions perform in (re)negotiating meaning. Additionally, the positioning of myself as the analyst in this study is equally important to the practice of discourse analysis and the particular themes that emerge. Just as the assumptions embedded in a text are culled through discourse analysis, my own notions of democracy, community, and the citizen-individual-participant are situated in my own positionality as a graduate student working on the PGIST project development team. The importance of recognizing positionality in academic research lies in the way meaning is negotiated through complex structures that, as social constructions themselves, shade the ability of the researcher to objectively pursue a commonly held understanding of the world (Ramsey 2004: 14) As these assumptions become more apparent, through careful unpacking, the potential for reconstructing these notions is entirely promising for the practice of PPGISc, especially pertinent to projects like PGIST, which intend to implement a form of electronic-democracy, hopefully situating intellectual inquiry within political geography, among other academic arenas. The process of becoming more aware of those notions embedded within CPGIS is begun through an introduction to the edited collection and the social-institutional context within which it was situated, an intertextual navigation of the academic texts

[2] The notion of the citizen-individual-participant, as used here, generalizes and encapsulates broad debate about the processes which define a participant in a democratic situation, as being negotiated between self-interest and group-interest.

which have cited CPGIS, and a reading of the way 'community' is calculated within CPGIS juxtaposed with the theoretical debate around the notion of 'community' in larger academic circles.

2.1 Text of texts

CPGIS is an edited collection of articles that emerged from a workshop held at the University of California, Santa Barbara in October of 1998, sponsored under Project Varenius, an initiative of the National Center for Geographic Information and Analysis (NCGIA). Obermeyer (1998) describes the push in the GIS community to articulate a 'public participation GIS', as a mixing of special meetings and workshops designed with the intent to carve out an agenda for a new sub-discipline. Here, Obermeyer touches on the topical areas of a public participation GIS, growing out of the system vs. science debates (e.g. Pickles 1997; Schuurman 2004): improving access, development as a societal process, empowerment, marginalization, and community interests. Following the Project Varenius workshop, Craig, Harris, and Weiner (1999: 18) describe similar themes in an unpublished report:

1) PPGIS can empower the community and its members.
2) Equal access to data and information is a key component of PPGIS.
3) Scale of data should match the needs of the community.
4) PPGIS use (and research about this use) should be appropriate to the needs of the community.
5) Establishing and maintaining community trust is key for people working with PPGIS.
6) PPGIS is purposefully value laden.
7) Consequences of PPGIS, both intended and unintended, should be monitored.
8) More than most other technology implementations, PPGIS involves ethical issues.

This report informs the later collection of articles in CPGIS. Clearly CPGIS represents these themes and the focus on the practice of PPGIS based on these themes comes at no surprise. The weight placed on notions of 'community' is important to note here, as later discussion of the meaning-making of the text, relies on the way this notion implicates the text in particular normative ideas about participation.

The text is broken into three sections: 1.) an introduction, which defines PPGIS and the use of 'community'; 2.) a set of case studies with subcategories of the inner city, planning situations, environmental management, and development; and 3.) articles describing future research in PPGIS. The intended audience of the book seems varied, certainly to include academics involved in the PPGIS tradition, as well as planners, and practitioners. This multiple sense of audience adds to the eclecticism of the edited collection; at times, it is difficult to see how certain articles fit between the hardback covers (see Aitken (2002) and Dangermond (2002) for an example of wide-ranging content). Even still, the text is touted by Goodchild to be "from pioneers who are developing the guidebooks, and creating the roadmaps." (Goodchild 2002: xxii) This statement might adequately describe the adventurism of the text; however, this claim of creating "guidebooks" certainly invites critique. Despite the wide-ranging content and the varied audience, the text represents a research trend in PPGISc and continues to be cited within PPGISc research to legitimate the practice of community involvement in GIS-supported, group decision-making.

2.2 Themes of practicing PPGIS

CPGIS is cited within recent academic works (since 2002) as a source for giving legitimacy to the practice of PPGISc, and is largely perceived to be 'pioneering', as Goodchild writes in the foreword of the book. By examining the way CPGIS is used in recent academic works, a better notion of the effects of the text for PPGISc can be used to unpack the intertextual relations between the text and other academic texts. Twenty-three texts were identified that cite CPGIS; four of which were book reviews that provide immediate access to a situated critique of the text. The way in which the text is used can be grouped into eight themes, where PPGIS:

1) accommodates community,
2) is situated *within* a community/home,
3) (dis)empowers users,
4) negotiates democracy, difference and access,
5) addresses conflict,
6) is used as a tool of activism,
7) is used as a tool of public record, and
8) is validated as a discipline.

These themes shall be discussed in this section as a way to position the text within a larger academic community. Certainly, these themes nearly match the themes drawn out of the Varenius project report, in the previous section.

Several texts point to the use of PPGIS to ***accommodate community***, through a notion that "public GIS is maintained to build community feeling" (McCall 2003:

553). Here CPGIS seems to illustrate the ability for 'community' to be facilitated through the implementation of the technology (Feick and Hall 2004; Goodchild 2003; Kyem 2004; Duke-Williams 2003; McCall 2003; Elwood and Leitner 2003; Harrison and Haklay 2002). CPGIS, for these authors, represents the possibility for building a community through trust, place, and confronting of pluralism as a site for debate and production of local knowledge. The citing of CPGIS to situate PPGIS as occurring ***within a community or home***, is a slightly different theme where the notion of community or the home is assumed fixed prior to influence of a PPGIS (Haklay and Tobón 2003; Kwan 2002a; Kyem 2004; McCall 2003; Elwood and Leitner 2003; Malczewski 2004). The privileging of a notion of 'community' for these authors is reinforced by CPGIS, a topic to be discussed in a later section.

The use of PPGIS to ***(dis)empower users*** is a theme that many authors cited CPGIS as a source, where participants in using the PPGIS are empowered or disempowered, whether through greater involvement or through the altering of power relations (Haklay and Tobón 2003; Sieber 2003; Nellis 2005; Kyem 2004; Goodchild and Haining 2004; McCall 2003; Elwood and Leitner 2003; Nyerges 2004; Kwan 2002a). This theme represents a core interest within CPGIS, drawing out the possibility for a public to become (dis)empowered through phases of informing, involvement, elicitation of local knowledges, community mapping activities, and alteration of power relations. The theme of PPGIS negotiating ***democracy, difference, and access*** is drawn out of particular research citing CPGIS, where the possibility of (dis)empowerment is realized through these articulations of democracy, difference

among participants, and access to the technology (Jankowski and Nyerges 2003; Kwan 2002a; Harrison and Haklay 2002; Kyem 2004; McCall 2003). McCall (2003) expresses a particularly interesting depiction of difference, one that begs attention for the broad interpretations with the PPGIS literature:

> Because they [an information underclass] are without the appropriate technical training or 'skills', the off-line goats are separated from the on-line wired sheep. … Technocratic planning models replaced 'neighbourhood discourse' … and introduced alien terminology, concepts and decision approaches which excluded the marginalised and less articulate—the elderly, blacks, and renters… (McCall 2003: 563)

McCall cites Elwood and Aitken from the CPGIS text, representing a new interpretation of difference, and probably one that Elwood and Aitken might take issue with. Marginalization and empowerment is typically viewed as a process and not generalized to segments of population. However, it is in these intertextual relationships between an academic text and the way it becomes cited in an intellectual argument that a discourse emerges.

Authors additionally cited CPGIS as demonstrating the ability for PPGIS to ***address conflict*** through the integration of multiple perspectives (Kyem 2004; McCall 2003; Parker et al. 2003), including the facilitation of ***activism*** (Kyem 2004; Elwood and Leitner 2003) and ***public record*** keeping (McCall 2003). Speaking to the legitimating power of CPGIS, several authors cite this text as a source for ***validating PPGIS*** as a discipline of study (Sui 2004; Duke-Williams 2003; Sliuzas 2003; Haklay 2003; Crampton 2002, 2003; Balram 2002; Harrison and Haklay 2002). These eight themes emerge from these recent articles, which cite CPGIS in ways that reveal the use of this text as a vehicle to formulate a discourse positioning particular notions of

democracy, community, and the citizen-individual-participant. The potential exists within this study, therefore, to unpack these themes in terms of the actual representation offered through the text, while realizing the wider potential for a PPGISc within a political geography.

2.3 Ambiguity of 'community'

The title of this edited collection, *Community Participation and GIS*, is certainly not beyond this analysis. The use of this particular book title may be more about the audience the publishers were intending to draw, as opposed to finding a more suitable name for a diverse collection (such as using 'PPGIS', which might more directly implicate this text within academic discussions); however, the editors of the collection chose to emphasize the notion of 'community' which explicitly drives their research interests, whereby 'community' is:

> defined by physical proximity to others and the sharing of common experiences and perspectives. The word [community] has become synonymous with neighbourhood, village or town, although communities can also exist in other forms – e.g. through professional, social, or spiritual relationships. (Craig, Harris, and Weiner 2002: 5)

There are much broader implications for this handling of 'community', and by exploring some theoretical debates within political geography, a better notion can be forwarded to describe just how broad a theory of participation might be.

Certainly, the notion of 'community' has become simplified, constrained by location and an assumed sense of belonging. Some literature within political geography question how 'community' is produced, rather than assumed, through negotiation and marginalization of certain subjectivities. Staeheli (2003) explores the

role of women in building community, attempting to understand the multiple meanings of 'community'. She argues that this multiplicity of meaning should not render the discourse useless, but rather should be further explored through new empirical techniques (in this case, the experiences of women). Likewise, Kwan (2002b) writes on the use of GIS by feminist geographers as being aware of these multiple notions of 'community' and their impacts for traditionally marginalized groups. Silk (1999) discusses four theoretical developments in 'community': 1) the debate between liberals and communitarians as to the role of the individual in community (for communitarians, the belief that people cannot choose the relationships that form communities, and for liberals that people ultimately choose to maintain community), 2) ideas about globalization and the "relations between place and space influenced by poststructuralism", 3) explorations of community as "collective identity" and "collective action", and 4) "constructed and contested nature of community in the context of power relations" (Silk 1999: 5). Silk conflates these tracks of thought into a discourse of community, "[suggesting] any or all of the following: common needs and goals, a sense of the common good, shared lives, culture and views of the world, and collective action." (1999: 8) Dwyer (1999) also writes that the collective nature of 'community' acts as a fluid organization in continuous conflict, through processes of identification and empowerment. Likewise, the possibility for virtual community can be extended from Radcliffe (1999), who identifies "imagined community" as existing "around domestic spaces" like a village or a church (1999: 51). These communities, Radcliffe writes, are in constant change

and at their intersection with the "nation-state… exists the possibility of glimpsing a more democratic and inclusive 'imagined community'." (1999: 51) This recognition of the ambiguity of community is largely muted within CPGIS, as evident in the definition of 'community' by the editors.

However, some researchers within GIS and geography have problematized 'community', and the implications for using this notion within system development. Pickles (1995) writes, "[t]he 'information highway' penetrates the terrain of contemporary life, links formerly separate locations, gives rise to new imagined communities, and fosters new 'spaces' for individual and collective identity." (Pickles 1995: viii) Clearly there is an understanding of community as influenced and produced through the use of GIS (Pickles 1995; Jankowski and Nyerges 2001; Harris et al. 1995; Elwood 2002a; Elwood and Leitner 1998; Harris and Weiner 1998; Aitken and Michel 1995). With increasing availability of information and increasing opportunity of access to GIS (Barndt 1998), the risk becomes treating people, and therefore communities, as the "other" (Curry 1995: 78). These authors problematize community largely through a lens of (dis)empowerment and marginalization, offering these distractions as a critique for a public participatory GIS. Instead, might it be more useful to confront 'power', addressing the necessarily unrealistic plurality of political power and embracing a notion of power that is more about (re)negotiation, instead of one of simple domination? Crampton calls for a critically political understanding of GIS and society for which he uses Foucault to introduce a new notion of power where the relationship between technologies and society "may be constraining or

emancipatory, but are not *necessarily* either" (Crampton 2003: 33, original emphasis). He continues, "power does not exist without its own resistance, … [but] is a negotiation between itself and a resistance" (33). Therefore, the potential exists for PPGIS development to benefit from a broader framework of participation based on a new conception of power which destabilizes a persistent discourse of public participation focused on (dis)empowerment and simple domination. To make this clearer, an analysis of CPGIS draws out the formulation of a particular discourse of democracy, community, and the citizen-individual-participant.

An emerging discourse of 'community'

> Indeed, we are concerned that the rapid growth of PPGIS might have the opposite effect of submerging a critical theory of GIS. PPGIS is not a panacea, and must not undermine the robust debate on the political economy of GIS, its epistemology, and the philosophy and practice of GIScience. (Weiner, Harris, and Craig 2002: 5)

As with any critical reading, a certain degree of explanation is required to absolve any covert objectivity on the part of the reader/researcher. The strength in research which uses discourse analysis lies in the overt positionality of the reader as brought out in their interpretation of a text. The production of knowledge occurs through relations that emerge between the text and the reader's positionality (which encompasses a whole host of cultural contexts: gender, race, class, ability, etc.). Therefore, the themes that emerge from my discourse analysis of CPGIS are of my own situated interpretation. My curiosity of the assumptions of democracy, community, and the citizen-individual-participant embedded within CPGIS lead me to believe that PPGISc

would benefit from an analysis of this text, leading PPGISc researchers to worry about their own assumptions involving these notions in their research, as the editors of CPGIS hint in the above quote. The "rapid growth" of new applications of PPGIS, while lacking any critical engagement with political theory (a tradition rich in debate around 'participation'), still represents a trend in PPGIS that needs to be critically investigated. As PPGISc research begins to consider a more balanced schema for academic inquiry, including a perspective of conceptual, methodological, and substantive domains, PPGISc shall benefit from positioning within broader academic circles, like political geography.

Here, I offer an attempt to position the argument that one might be able to make academically through the citation of this text: CPGIS loosely represents a weaving narrative about society and technology, where GIS is thought to be a tool of reason and communication, realized as supporting 'community' while facilitating resistance. The book posits a stable notion of 'community' and 'public participation', and describes how GIS supports consensus and the collection of local knowledge, and simultaneously (dis)empowering a public. These themes reveal a paradigm in thought about participation, and further explanation follows to help position these themes as they emerge out of the text.

An immediate limitation to this research should be made explicit at this juncture, before getting into the details of analysis. The role of the institutional structures of academic publishing in guiding both the kinds of scholarship offered in CPGIS and the power exercised in the editing of individual articles to meet certain

specifications are indeed in play here; however, taking this question up would require an entirely different chapter. Furthermore, taking the text on its own terms and drawing out the ways in which meaning is made through the text's relationship with researchers in PPGISc is the core of this research. The object of study, in this case, is the discourse that emerges; therefore, one might argue that recognizing the structures of academic publishing at work (while a certainly interesting question) is somewhat irrelevant here. As such, I shall begin at the very beginning – the foreword by Michael Goodchild – and attempt to tell the story of CPGIS through an analysis of particular segments within the text:

> When such descriptions are sufficiently precise, it should be possible to *reason and analyze them automatically* by selecting from a battery of standard techniques; but precision should not be a requirement for entry into the GIS world. (Goodchild 2002: xxii, emphasis mine)

In this excerpt from the foreword, the power of a public participating using GIS to reason and communicate information emerges as one theme in the CPGIS narrative. The role of the Habermasian public sphere (1989) presumes this ability to communicate and reason, although this edited collection does not draw this connection, as such. Goodchild confronts a notion very much driving the entirety of this book; the notion of GIS as prescribing a certain rationality to its use. Additionally, Jack Dangermond of ESRI writes in his chapter of the text,

> … GIS provides a *common language* for discussion and acts as a means to bring people together in the decision-making process. (Dangermond 2002: 308, emphasis mine)

Here, the use of GIS is connected directly to communication in a "common language" of maps to structure a sense of 'community'. Again, the potential for a

communicative GIS optimistically presumes common ontological and epistemological grounding for all participants, something Nancy Fraser (1992) problematizes as multiple public spheres. The notion of accommodating or producing 'community' also seems informed by communitarian notions of a citizen, although these links are never made explicit. Here, the use of GIS helps to

> *educate* a community and help it to *develop* a voice that can challenge powerful market-driven interests. (Parker and Pascual 2002: 64, emphasis mine)

The role of GIS in producing community permeates throughout the text, operationalized as education or local development, presuming an economic rationality where political institutions are analyzed as a means and an ends, focusing on institutional arrangements (Elkin 1985). The 'community' is (re)produced through the use of PPGIS. The use of the technology in this context, presumes a notion of group interest, or a sense of unity in the individual participants. The implications for this assumption are substantial given the discussion of the theoretical debates around 'community' in the previous section. Community mobilizes a political 'we', and is argued to gloss over a liberal notion of an individual situated in diverse cultural context. The text also touches on the capability of PPGIS as a tool of resistance, where a community uses GIS

> to *oppose* and *disarm* the agencies that adopted GIS much earlier, under the older paradigm. (Goodchild 2002: xxii, emphasis mine)

Again, the use of GIS presumes a 'community' of common interest to resist. The importance of realizing the way 'community' is mobilized throughout CPGIS reveals

the participation imagination[3] captured within this text. This paradigm of thought is realized through the explicit defining of 'community' and 'public participation'. Community is largely referred to as physical space, although the theoretical interpretations of the use of 'community' within this text is telling of a particular notion of democracy, where 'public participation' is considered "community-based action" and "grassroots community engagement" (Weiner, Harris, and Craig 2002: 5). The importance of situating participation within a model of democracy is rather apparent, as particular models (whether liberal, deliberative, or radical) inform the ways in which participation is supported (Held 1996; Cunningham 2002). However, CPGIS makes no explicit claims to any model of democracy, assuming certain normative ideas about consensus, interest, and representation are inherent in their notion of 'community'.

There is a realization within the text that much of the ineffectiveness of the practice of PPGISc resides in the way these terms (community and participation) are defined, where there is a

> failure to take into account and directly confront the diversity, contending perspectives, and unequal power relations among community members. (Stonich 2002: 266)

Here, Stonich realizes that the notion of community is not so uncontested. The notion that 'power' is not equal for all members in the deliberation, begins to pull at the

[3] Here, imagination is used as a method of deconstructive analysis, where the particular metaphors used in literature about participation (and methods of supporting participation) are telling of certain presuppositions by the author(s) – in a way, providing the grounds for describing certain epistemological and ontological limitations for such an account.

somewhat stalwart notion of 'community'. Additionally, the notion of consensus and collection of local knowledge presumes a notion of a political 'we' in this text, and the way 'community' is defined informs consensus reached through a negotiation of local knowledges:

> A consensus should be encouraged toward a community mission to support the information infrastructure. No national or state initiatives can replace the local effort… (Barndt 2002: 353)

Here, Barndt posits the importance of consensus for 'community' goals; however, a notion of consensus is only possible through the bartering of situated and local knowledges, where individuals will be asked to minimize a particular value (or interest) in return for community gain (or common good). The challenge of 'community' as a core theoretical patterning for PPGIS occurs at the notion of consensus – some participants will be empowered, while others (by definition) will be disempowered:

> GIS and digital databases have the potential to be used in ways that enhance as well as limit the participation and power of some residents. (Elwood 2002b: 86)

As discussed in the previous section, the notion of (dis)empowerment in PPGISc may need to be rethought not as *how much* power one has or is able to gain over another individual, but as a question of *in what ways* the political power of participants are the outcomes of situated conflict. By reducing our focus on questions of "how much", as represented in the common ladder and spectrum imagery of Arnstein (1969), IAP2 (2005), and CPGIS, we might potentially gain a more nuanced understanding of the politics of participation for well-informed PPGIS development.

As this section has hopefully shown, CPGIS represents a diverse narrative about the struggles for practicing PPGISc, emphasizing the notion of 'community' as the driving normative ideal for informing how the text grapples with consensus, empowerment, self versus group interest, and the privileging of local knowledges, among others. The previous section described the ways in which the text has been cited in academic literatures (since 2002), and has additionally shown that this text's academic "shelf life" will continue as evidence to reinforce these particular normative ideals. It is our responsibility, as PPGISc academicians, to continue to (re)investigate these claims with the intent to develop a technology capable of reflection and, as necessary, change.

Futures for theorizing PPGISc

> The implication of what I am saying here is that the maps and discourses that surround PPGIS, planning and environmental management may be the primary means through which boundaries are established and spatial differentiation takes place. (Aitken 2002: 362)

Illustrated by the narrative that emerges from CPGIS, implicated in implicit notions of democracy, community, and the citizen-individual-participant, what seems to be lacking are explicit theories of participation to inform a PPGISc. In the closing section of the text, some reflection by Aitken (cited above) hints at this need for a wider realization of political theory within the discipline. The practice of PPGISc, as contained within CPGIS, has much to offer political geography and vice versa. Haklay writes, in his review of the book, that the discipline of PPGISc seems "narrowly focused", and that a new research agenda exists for positioning PPGISc

alongside academic debate within planning, GIScience, and collaborative decision-support systems, citing Jankowski and Nyerges (2001) as an example of such an effort (Haklay 2003: 320). Here, I discuss a potential future for theorizing participation in PPGISc, using Jankowksi and Nyerges as Haklay has encouraged.

Jankowski and Nyerges (2001), in their PPGISc studies of participatory decision-making processes supported by GIS, outline a theory of participation they call Enhanced Adaptive Structuration Theory 2 (EAST2). EAST2 is a theory of GIS-supported collaborative decision-making which describe three components of a decision situation, including the convening of a participatory situation, the social interaction in a participatory situation, and the outcomes of a participatory situation (Jankowski and Nyerges 2001). EAST2 appreciates the complexity of public participation, and offers methods for unpacking these complexities, especially as related to the notion of 'participation'. The theoretical rigor of EAST2 lies in the seven premises for GIS-supported collaborative decision-making and validates the need for structured participation methods (Jankowski and Nyerges 2001: 46-47):

1) Social-institutional influences affect the appropriation of group participant influences and/or social-technical influences;
2) Group participant influences affect the appropriation of social-institutional influences and/or social-technical influences;
3) Participatory GIS influences affect the appropriation of social-institutional influences and/or group participant influences;
4) Appropriation of influences affect the dynamics of social interaction described in terms of group processes;
5) Group processes have an affect on the types of influences that emerge during those processes, and emergent influences affect the appropriation of influences;
6) Given particular influences being appropriated, if successful appropriation occurs and group processes fit the task, then desired outcomes result; and

7) Given particular influences being appropriated, if successful appropriation occurs and group processes fit the task, the reproduction of social-institutional influences result.

Each premise offered takes a particular stance on the possibility for uncovering various dimensions of a decision-making situation. Foundational here, is an assumption about the calculability of the process (attending a sort of economic rationality), where as each premise or dimension is evaluated, the value of each forms the total sum of the decision-making process. EAST2 realizes the complexity of the political analysis of participatory situations through the attention given to the degree to which society, individuals, participation structures, and technology have an affected outcome.

However, a broader explication of 'participation' should include feminist and political geography, where realizing the potential investigative benefits of a political rationality, institutions are studied as necessarily constitutive, in continuous acts of (re)shaping these institutions (whether societal or political). Brown and Staeheli (2003), in reviewing the current trends in feminist political geography, offer three themes of research: the distributive, the antagonistic, and the constitutive. The first theme, the *distributional*, focuses on the distribution of 'power' in society. The *antagonistic* refers to studies of conflict. The final theme, the *constitutive*, highlights the notion of the political as a process. Each theme, as a method of inquiry, potentially forms a direction of studies for a PPGISc. In doing so, PPGISc would confront notions of 'power' and the political which would certainly assist in unpacking the complexities of participation.

Returning to Haklay's critique of a lack of theoretical framing of PPGISc as positioned by CPGIS, we can realize the great potential for continuing to interrogate our assumptions and understandings of participation. Likewise, the theorizing of participation should not serve to over complicate the development of PPGIS, but should broadly bring the research and development of PPGISc to visible debates and discussions within political geography, addressing a need drawn out by a discourse analysis of CPGIS. By continuing to position PPGISc within this political discussion, a viable and legitimate discourse emerges and the possibility for synergistic scholarship informs new research strategies.

Conclusions

> Community is not a static notion, but is defined in the achieving of it. (Delanty 2003: 124)

Delanty, in his book aptly titled *Community*, traces the theorizing of 'community' through different academic paradigms never resting on a stable or fixed definition of the term. Likewise, he cites not one PPGISc researcher. There is a considerable opportunity that exists for incorporating a theoretical framework of participation at the object of study for PPGISc. The themes of democracy, community, and the citizen-individual-participant as they are (re)negotiated within CPGIS are cogent reminders of this opportunity. The citing of CPGIS in current PPGISc research demonstrates the impact that this text has (and may continue to have) for future research in PPGISc. I have argued that this text represents a discourse legitimizing a rather simplistic notion of community as the principle theory for participation. This study has drawn out the

intertextual relationships between the CPGIS narrative and recent works of PPGISc researchers using discourse analysis to reveal a need to visit and revisit how these assumptions about 'participation' inform future system development situated in new theories of PPGISc. Furthermore, a look into the potential beginnings for theoretical framings of participation was explored by interrogating EAST2 (a theory of participation for PPGISc) through a juxtaposing of themes of feminist political geography.

As mentioned in the previous section, Brown and Staeheli (2003) offer three approaches to problematize the political: the distributional, antagonistic, and the constitutive. I have drawn attention to a lack of the constitutive approach to the political within PPGISc, as supported by a discourse analysis of *Community Participation and GIS*, questioning its role in (re)producing simplistic notions of 'community'. A broadening of PPGISc research and practice necessarily must also consider the distributional and antagonistic approaches. A distributional approach refers to the distribution of 'power' (a notion I argue PPGISc research handles rather unidimensionally) in decision-making situations, where an acknowledgment of unequal access to political resources and potential advantages to control people and processes should be a core concern in the research and practice of attending to political struggle. An antagonistic approach to understanding the political in PPGISc would additionally recognize the necessarily conflictual circumstances of decision-making situations, and that any consensus-driven approach negotiates this conflict in ways that may ultimately undermine the potential for realizing the distributional

approach to any democratic situation. Finally, a constitutive approach, consistent with the questions I have posed in this chapter, interrogates the formation of a 'we' as a necessary theoretical component for decision-making situations in PPGISc practice. Realizing the constitutive quality of politics encourages PPGISc research to further investigate any assumptions about the spaces of decision-making. Feminist political geographers have emphasized the "spaces of home, neighborhood, work, religious observance, and community" as spaces where the political is constitutively formed (Brown and Staeheli 2003: 252). Likewise, this chapter has worried the assumptions of the latter in a discourse analysis, questioning the (re)production of 'community' as being the political motivation which informs the practice of PPGISc. Many more questions have not been addressed; I have only explored a small portion of a much larger project to uncover and resituate the research and practice of PPGISc in a way which more adequately grapples with leading theoretical directions in feminist political geography. Further examination of the intricacies of a notion of 'participation' in PPGISc is needed. In the following chapter, I intend to explore this area of research and development by confronting a notion of 'power' implicit in efforts to design methods of participations to support democratic decision-making.

Realizing multiple dimensions of 'power' in PPGISc: a comparison of methods to support structured participation

> …to have equality, in a constitutive view, is to have institutions that create a certain set of activities, not produce a certain outcome. (Elkin 1985: 263)

This chapter addresses the need for a theoretical framing of a public participation geographic information science (PPGISc) by inviting attention from political theory around the notion of 'power'. The object of study within a PPGISc (more broadly, a 'critical' GIS) is situated within the societal implications of a public participation geographic information system (PPGIS), as an alternative to tool-based understandings of GIS. In particular, PPGIS as a *process* within society presumes normative understandings of topics like democracy, community, and the individual – topics which academic fields like political theory continue to explore. The need to support participation within a web-based PPGIS requires a consideration of the role 'power' plays in an explication of traditional methods for supporting same time, same place (synchronous) decision-making as they might be applied to a different time, different place (asynchronous) setting. This consideration assumes the constitutive quality of political inquiry, where (extending Elkin 1985) the *process* of PPGIS lies in the ways meaning is produced through its use in society.

Therefore, the study of synchronous participation methods hopes to offer alternative ways of approaching and understanding the development of asynchronous methods for engaging groups of people in participatory, GIS-supported decision-making. Through a comparison of participation methods, general limitations for synchronous participation methods are revisited, and the particular ways in which a

normative ideal of participant 'power' is implicated within these methods of participation emerges from this comparison. This research discusses how power is considered in public participatory geographic information science (PPGISc) where structured methods of participation become the panacea for supporting deliberative processes. As desktop GIS continues to evolve, PPGISc research moves forward new ways to involve people, particularly in university-community partnerships (Leitner et al. 2002). The PGIST project represents one such partnership and is studying the way in which participation can be systematized while exploring the implications, as such, for Internet applications which implement a notion of electronic-democracy in transportation improvement program decision-making[4].

The qualifier *structured* as often loaded with meaning in academic literature is used here to denote participation methods that have a sequencing of specific group activities as a set of procedures, chosen for their suitability to address a particular goal or objective. However, other meanings of 'structure' should certainly be discussed, as the necessary relationship exists between procedures or activities which offer structure to group processes is always implicated in (re)negotiations of political structure (whether through race, class, gender, sexuality or other forms of the constitutive arrangement of the political). The PGIST project is interested in exploring structured participation methods as a way to systematize participation for an analytic-deliberative

[4] Transportation improvement program decision-making refers to the substantive issue of decision-making about the collection of improvement project scenarios that have approved funding.

process[5] and therefore takes a stance toward providing organized activities to support group processes in decision-making. The emergence of web services and distributed Internet GIS make possible the opportunity to involve a large group of people in a decision-making situation (Peng 2001, 1999; Dragicevic 2004; Dragicevic and Balram 2004). Questions remain: how can participation be structured in large group decision-making? How do these methods of participation confront 'power' and shade the resulting model of democratic participation that emerges?

These questions are analyzed, in two sections, where the notion of an asynchronous public participation GIS is informed by: 1.) exploring the opportunities and limitations of synchronous structured participation methods, by developing comparison criteria and implementing a comparison of five participation methods; and 2.) discussing the handling of 'power' within these methods in relation to the potential for multiple dimensions of 'power', by exploring the normative assumptions of 'power' constituted through these procedures. However, the situating of this study within a validity network accommodating the interests of a PPGISc is first offered. Secondly, the positioning of the original need for structured participation as central to a system supporting deliberation is reviewed. Here, the importance of the limited conceptual understanding of 'power' within these methods of structured participation is drawn out as emerging from the Habermasian perspective of a pre-existing speech-

[5] Analytic-deliberative describes a process where methods of data analysis (calculation, assessment, structuring of data or information) are incorporated within deliberation (structured or organized dialog) to assist in decision-making situations where a group of people are needed to discuss and analyze data (e.g. a discussion and ranking of alternative sites for environmental cleanup) (National Research Council 1996).

act situation. The five methods of structured participation are then introduced as the supposed ends of a political process – a notion which is later problematized in the two-part analysis section of the paper.

Confronting a lack of theoretical framing for PPGISc

Structured participation methods were realized as organized activities for participants to generate and refine ideas, especially those designed to problem solve and provide for "meaningful participation", a notion discussed further in this section. The PGIST project is faced with the dilemma of providing "meaningful participation" in transportation decision-making to large groups, a study situated within the research domain of PPGISc: developing new systems where participants are empowered to contribute to a decision-making process while analyzing the social implications of such a development. The difficulty then is in determining how empowerment is to be measured, relating directly to the explication of 'power' and the adoption of a particular model of democracy at the center of this system development. One might turn to PPGISc for assistance in unpacking the notion of participation; however, as Webler (1999) proposes, the lack of a comprehensive academic perspective in PPGISc research, whereby practice informs theory and theory informs practice, limits the development of the discipline and adds to theoretical fragmentation. Therefore, research in PPGISc should continue to articulate a balance between the theoretical, methodological, and the substantive domains of research.

2.1 Validity networks, or a research perspective

The distinction in research focus as a validity network schema[6] allows for a more thorough topic exploration, especially as applied to the expanding discipline of PPGISc (cf. Nyerges, Jankowski, and Drew 2002; Elwood 2002a; Haklay and Tobón 2003). Within PPGISc research the trajectory of information offered through participant interactions might be systematized. The systematization of participation is a key component of a PPGIS design; likewise, the ability to systematize the transformation of data within a participant group. Drawing on theories of cognition, Nyerges (1993; 1995) traces data through transformations of information, knowledge, and wisdom (organizational memory). Additionally, through these data transformations, evidence as corroborated information is eventually realized, and corroborated information (either for or against) leads to knowledge building in social science research (Brinberg and McGrath 1985). Specific to the particular research question in this study, evidence lies in the comparison of five structured participation methods, and the discussion that emerges out of the framing of this comparison confronting notions of 'power'. This chapter discusses participation envisioned

[6] As discussed in the introduction, these three domains (concepts, methods, substance) comprise a validity network schema, articulated by Brinberg and McGrath (1985), which can be used to demonstrate the multiple perspectives within PPGISc. The validity network schema is used to articulate a research process and the relationships that form a logical construction of validity that is "relative to purposes and circumstances." (Brinberg and McGrath 1985: 13) Therefore, validity in PPGISc research is entirely dependent upon the focus of the research. Often information technology studies focus on developing new technological methods with which to study the occurrence of phenomena. Alternately, society and technology studies focus on the societal implications of not only the development, but most importantly the usage of those technologies to constitute the political, by using methods of social science, implicated in particular social theories.

through particular methods of structured activities. These processes, when compared, illustrate a rather simplistic notion of 'power', highlighting general assumptions about group decision-making realized through binaries of empowerment/marginalization, consensus/dissensus, and individual/group interest. This research employs a validity network schema comprised of *theories* of 'power' and participation, using a comparison *method*, and the *substantive* study of particular procedures of group activity.

2.2 Five methods to support group processes

Five methods have thus been identified within planning and management literature as potential alternatives to conventional, unstructured group processes[7]. These include *nominal group technique*, *Delphi process*, *technology of participation*, *open space technology*, and *citizen panel/jury* (Delbecq, Van de Ven, and Gustafson 1975; Spencer 1989; Axelrod 2000; Brahm and Kleiner 1996; Dowling and St Louis 2000; Roth, Schleifer, and Switzer 1995; Turoff and Hiltz 1996; Andersen and Jaeger 1999). Each method was chosen for this comparison study as each offers a set of quite different procedures to address similar consensus-driven outcomes. Each of these methods, additionally are conceived prototypically as supporting group process which is synchronous or near-synchronous (same time, same place). The practice of PPGISc

[7] The PGIST project has identified over thirty methods of participation (cf. "Citizen Science Toolbox," an Internet repository (Coastal Zone Australia Ltd. 2004)), and selected five methods which might best articulate the various approaches to structured group process. As this particular study focuses on particular notions of 'power' which emerge from a comparison of methods of participation, a minimal set of methods is needed to convey ontological and epistemological overlap. Even still, an attempt has been made to choose methods that have been popularly deployed in management and planning situations.

in large group processes makes any face-to-face solution unwieldy; therefore, asynchronous methods seem a likely solution to support large group processes and the comparison of procedures support this kind of development. Challenges for modifying synchronous methods of participation to support online, asynchronous participation shall now be further discussed.

2.3 Deliberative group process: from synchronous to asynchronous

The PGIST project is concerned with engaging a large group of people in an Internet-based decision-making situation using tools which facilitate the analytic-deliberative process. In much of previous PPGISc research, the analytic-deliberative process has been implemented using face-to-face deliberative techniques (Leitner et al. 2000; Elwood 2002a; Leitner et al. 2002; Elwood and Leitner 1998; Ghose 2001; Jankowski and Nyerges 2001; Craig, Harris, and Weiner 2002). As GIS-based services are developed for access through the Internet, the possibility exists for designing asynchronous techniques for deliberation, supported by GIS-enhanced analytics. Jankowski and Nyerges (2001) envision online participation as a type of meeting, among: 1.) conventional meetings (same time, same place), 2.) storyboard meetings (different time, same place), 3.) conference call meetings (same time, different place), and 4.) distributed meetings (different time, different place). Assuming the complexities of decision-making situations, the possibility of using only one type of arrangement to facilitate group decision-making is unrealistic.

Due to the focus of this study on asynchronous methods of structured participation, a reading of Jankowski and Nyerges's typology of meetings might

extend ‘place’ to mean virtual place in the PPGIS. This new typology would focus on Internet-based tools employed across a spectrum of asynchronous settings (see table 2.31). Thus, the use of ‘meeting’ as a broad characterization of deliberation is replaced with ‘session’, describing the virtual place of participation in an Internet-based, participatory, GIS-supported, decision-making situation. Four types of session arrangements emerge: 1.) *grounded sessions*, 2.) *bulletin-board sessions*, 3.) *conference sessions*, and 4.) *distributed sessions*. Each depict a potential virtual landscape for participants in the PPGIS. ‘Grounded’ refers to a session where all participants deliberate at the same time on the same topic or analytic task. Bulletin-board sessions allow participants to engage in a particular topic or task, at all times. A conference session is a type of interaction that occurs where participants work on many different tasks or discuss many different topics, but because they are using the system at the same time, they are able to converse with other participants instantly. A distributed session is one where participants explore many different topics and tasks at any possible time. These four session arrangements depict a PPGIS where participation occurs across combinations of time and virtual place. Place, as a virtual creation necessary for online structured participation, informs the constitutive construction of the political, as shall be discussed in the comparison section. Certainly, the imagining of a ‘power’-free landscape of political opportunity which drives the foundational understanding of deliberation should be seen as problematic. For while the undertones of participants communicating within a leveled-playing field

void of political power dynamics is normative, we cannot assume that such a situation actually would in fact exist.

Table 1. Sessions arrangements across time and 'place'. Session arrangements focusing on use of Internet-based, decision-making tools. Here, 'place' refers to virtual place in the PPGIS. *(extended from Jankowski and Nyerges 2001: 71)*

	Same time	***Different time***
Same 'place'	**'Grounded' session** -- provides participants with an opportunity to gain an understanding of various concerns about the system or the situation -- useful for interactions needing more directed attention to details -- system must provide high frequency and concurrent requests for analytical tools to support session	**Bulletin-board session** -- like a BBS, participants can use tools and save their work in a place which can be accessed by the entire group -- participants are released from scheduling time for group work -- system must provide secure, version-controlled session
Different 'place'	**Conference session** -- participants engage with many sections of the system, while instantly communicating with other participants -- system must provide high frequency and distributed requests for analytical tools	**Distributed session** -- participants engage with many sections of the system, while posting messages to other online/offline participants -- system must provide secure, version-controlled session, where communication is facilitated across a spectrum of instant response to delayed response

2.4 Structuring participation: from meaningful to empowered

The possibility for enhancing public participation in transportation decision-making is hinged on the potential for broad participation from the 'community'. This possibility for participation has been described in many ways, pulling on particular understandings of what is considered "meaningful" or "empowered". US federal law mandates "meaningful participation" in transportation decision making (NEPA 1970; U.S. Department of Transportation 1998); therefore, a great deal of research has posited solutions to the dilemma of providing efficient, effective, and equitable public participation (Nyerges et al. 2003). One interpretation of "meaningful", might be where participants are granted some degree of empowerment. However, the definition

of empowerment seems to remain the responsibility of system designers; many articulations of empowerment convey some sort of ladder-like imagery, premising certain activities of informing as the foundation for any decision process (Arnstein 1969).

Arnstein (1969) puts forward the notion that citizen participation is an expression of citizen power. Presupposing the process of informing a public, Arnstein's ladder of participation depicts a foundation of nonparticipation, which must be overcome to reach the upper rungs of the ladder. Nonparticipation, here, encompasses two rungs: 1.) manipulation, and 2.) therapy. Citizens are in effect patronized, while those in power "'educate' or 'cure' the participants." (Arnstein 1969: 217) Manipulation refers to the process whereby officials launch a public relations effort to persuade a citizenry toward reaching an agreement. Therapy is the insidious activity of engaging a citizenry in an activity, with the intent to disassociate participant groups from their particular decision-making values. These two rungs of the citizen participation ladder represent the lowest power holding for citizens. An ethical structuring of citizen participation is meant to avoid the pitfalls of manipulation and therapy and make the possibility of empowerment systematic and essentially guaranteed.

The leap from 'meaningful' to 'empowered' seems substantial, and requires a somewhat simplistic understanding of 'power' as something participants need to obtain, requested, ironically, from those making the decision about *how* participants should participate. What seems to be articulated is a form of deliberative democracy

(people are encouraged to discuss and debate issues of common interest), pulling on a notion of classic pluralist 'power', defined as the amount of direct control one participant has over another (Dahl 1961). This pluralist notion of 'power' must contend with a notion of nonparticipation. Bachrach and Baratz (1962) critique Dahl's (1961) account of pluralism in describing two faces of power: one which is the apparent decision-making process articulated by pluralists, and the second, the insidious potential for nondecision-making. Nondecision-making, similar to Arnstein's nonparticipation, describes subversive acts of power, which disassociate and coerce citizens in the decision-making process. However, this topic shall be taken up in a later section.

2.5 Participation as a conversation

Participation methods must address several challenges, some of which might be centered around group process as enabling: 1.) communication, 2.) cooperation, 3.) coordination, and 4.) collaboration (Jankowski and Nyerges 2001: 50). Each level begins another layer of complexity of group process, and therefore, each as procedures are implicated in notions of 'power' pertaining to the activities of a participant. This particular framework for unpacking the nature of 'participation' could be critiqued as being implicated in an economic rationality for participant involvement, whereby the focus is on analyzing the particular costs and benefits realized by the participants to exhibit an underlying efficiency. Additionally, the normative ideal of communicative rationality seems extended, where, as Habermas (1979) writes, the challenge is placed on supporting the process of reaching an understanding. Habermas (1979) writes that

ideal conversation presumes certain claims of validity, focusing on communication. What Habermas offers is a foundational norm for supporting group process, although he and his supporters would argue that this theory of communicative rationality merely describes an articulation of an ideal situation (and not foundational) (White 1988). For Habermas, 'understanding' in deliberative process is composed of four claims of validty: 1.) comprehensibility, 2.) truth, 3.) truthfulness, and 4.) rightness (Habermas 1979: 3). These procedures for supporting group process are supported by deliberative and participatory democrats (Gutmann 1993; Gutmann and Thompson 2004; cf. Cunningham 2002), although critics argue that the application of such an ideal speech situation naively assumes too much about the ways participants are given voice (Young 1996, 1997).

The notion of a conversation brings scores of debate around what is assumed epistemologically and ontologically when supporting a process of conversation through a Habermasian tradition (cf. Calhoun 1992). As previously discussed, the assumption of 'understanding' presupposes certain economic and communicative rationalities within a public sphere. Fraser (1992) argues that Habermas (1989), in his articulation of a public sphere based on a study of bourgeois society, inadequately addresses contradictory public spheres where political power is not so easily "bracketed and neutralized" (Fraser 1992: 115). Instead, Fraser warrants a new vision of public sphere, and thus the possibility for deliberation (re)contested by multiple publics. Deliberation, as Fraser writes, is composed of individual expression and construction of cultural identity and requires an articulation that is constitutive.

Realizing participation as a conversation, or a set of conversations, necessitates an engagement with various discussions about the act of communication. However, the practice of PPGISc should engage with this complexity in defining participation, worrying the assumptions made in adopting particular methods of structured participation. As academicians and practitioners bring various methods of participation under comparison (as this research intends), participation is shown to be constitutive through the very procedures to which each adheres (whether communicative or deliberative, or otherwise). Likewise a notion of 'power' in the classic pluralist sense becomes quite unstable as the sense of the prepolitical rationality of participants breaks down leaving an artifact of behavioral inquiry.

2.6 Participation imaginations

Tools built for the practice of PPGISc define participation as something created, encouraged, and maintained (cf. Craig, Harris, and Weiner 2002). This notion is exemplified in particular attempts to measure or provide a rationale for participation processes, using metaphors like ladders and spectrums (Arnstein 1969; International Association for Public Participation 2005). It is important to understand how these five participation methods employ particular imaginations[8] of participation as something (from nothing), which is teased out of group processes and disciplined

[8] Here, imagination is used as a method of deconstructive analysis, where the particular metaphors used in literature about participation (and methods of supporting participation) are telling of certain presuppositions by the author(s) – in a way, providing the grounds for describing certain epistemological and ontological limitations for such an account. This strategy is not new to political geography; Gregory (2004) uses the notion of a geographical imagination to describe how the political is constitutive through interactions (individual to global) addressing the constructions of safety and threat.

through structure in the form of specified procedures. The strategy of this thesis is to describe this participation imaginary embedded within structured participation methods as they are compared. Through the development of criteria for comparison and the actual process of comparison, this imaginary is realized in terms of an emerging notion of 'power'.

Comparing five methods of supporting structured participation

Five participation methods have been selected by the PGIST project in a comparison to inform development of a structured, asynchronous decision-making support system. Each method can be clustered into two categorical models, which best describe the context for their development and implementation within planning and management literatures: 1.) judgmental participation, which describes a situation where a problem seeks resolution through the use of deliberating 'experts', and 2.) organizational change participation, which comes out of the context where an organization wishes to make a change which best reflects the reservations and recommendations of all members affected by a proposed change. These two models embody different theories of democracy: the former more of a deliberative or participatory democracy, the latter a communicative democracy, a theme that shall be discussed in greater detail later in this section. Three methods shall be placed in the category of judgmental participation: 1.) nominal group technique, 2.) Delphi process, and 3.) citizen panel/jury. Two methods compared comprise the category of organizational change

participation: 1.) technology of participation, and 2.) open space technology. A brief introduction to each method is offered here, with analysis in the following sections.

3.1 Scoping a decision situation: judgmental participation

Judgmental participation can be described as a situation where participant "experts" are needed to address a lack of local (in this case, expert) knowledge or a lack of consensus (Delbecq, Van de Ven, and Gustafson 1975: 5). Delbecq et al. evaluate participatory methods using specific dimensions of judgmental decision-making, to include: 1.) search behavior, 2.) normative behavior, 3.) equality of participation, 4.) method of conflict resolution, 5.) and closure to decision process, among others. (1975: 20) These dimensions reflect the judgmental participation imagination, where emphasis is placed on the resolution of conflict as participants drive toward consensus and a resulting judgment. The creators of nominal group technique (NGT), Delbecq and Van de Ven, evaluated NGT in relation to the Delphi process using this set of criteria, guided by this imaginary.

3.1.1 Nominal group technique

Nominal group technique (NGT) is a structured form of brainstorming or brain-writing followed by a vote or prioritization in a synchronous setting, with up to 10 participants and an experienced facilitator (or 3 to 4 groups of up to 10 participants, with a spokesperson for each group and a single facilitator overall). (Mycoted 2003) Developed in 1968, Delbecq and Van de Ven write that NGT addresses equal participation, creative expression of ideas, and aggregation techniques for judgment (Delbecq, Van de Ven, and Gustafson 1975: 9) By giving each participant a chance

to submit an idea, creators of NGT believe they are ensuring equal participation. NGT is considered a 'creative' process due to the nature of idea collection, clarification, and evaluation. Participants are allowed to put forward ideas and clarify these ideas, evaluated by other participants. Final judgment is computed using particular prioritization aggregation techniques.

3.1.2 Delphi process

Delphi process, developed in 1950 by the Rand Corporation, is a series of questionnaires, each building on the responses of previous questionnaires, which require a panel of participants to synthesize and determine the nature of follow-up questionnaires. Delphi's strengths are believed to lie in the ability to collect information from multiple participant 'experts' using iterative questionnaires and to assist decision makers to produce an informed judgment. (Delbecq, Van de Ven, and Gustafson 1975)

3.1.3 Citizen panel/jury

Citizen panel/jury, also known as a consensus conference, is a situation where citizens are informed of an issue and encouraged to deliberate (through formal presentation of evidence, argument, and rebuttal) to offer a solution to a governing body. (Jefferson Center 2004; Sclove 2000) Consensus conferences, Sclove (2000) writes, were developed to ensure democratic involvement of all affected citizens in policy decisions (Sclove 2000: 33). Similar to Delphi process, an 'expert' panel is formed to prepare position statements to address a particular problem. Citizens form a lay panel and are encouraged to ask questions which will assist in their development

of a report of recommendations. The sense of democratic engagement rests on the possibility that every participant (in this case, an 'affected citizen') is able to contribute to the panel, whether in the form of a question or point of clarification. Final judgment rests in the hands of the board of decision makers, who take the considerations of the 'expert' position papers and the lay panel recommendations report.

3.2 Deliberating toward a shared understanding: organizational change participation

Organizational change participation is distinct from judgmental participation due to the deployment context for each, as well as what seems to be different democratic models. As organizations grow, involving members in a discussion of a proposed change is a strategy for balanced growth and is supported through methods of organization change (Spencer 1989; Axelrod 2000). Members are encouraged to deliberate over their reservations and recommendations for the organization. By promoting a shared understanding among members, as it is assumed, organizational elites can better make decisions regarding necessary changes. Technology of participation and open space technology demonstrate two such methods of organizational change participation.

3.2.1 Technology of participation

Technology of participation (ToP) is a participatory process of defining a context for discussion through brainstorming, ordering, labeling, and evaluating of individual ideas. People are selected based upon a stake in the development and/or implementation of a strategic plan. (Spencer 1989) As an organizational change

method of participation, ToP demonstrates an ability to allow members an opportunity to suggest items for deliberation through structured discussion activities.

3.2.2 Open space technology

As a different approach from ToP, open space technology (OST), developed in the mid-1980s by Harrison Owen, allows participants to formulate a structure for discussion by using the imaginary that order is formed somewhat organically, in what seems to be a largely unstructured deliberation. In this particular organizational change participation method, participants enter a room where multiple discussions are taking place. As a participant decides to formally announce the topic of interest, a gesture is made to inform the entire group of a particular discussion. Any participant can announce discussions at any time. Clustering occurs where interested participants can mingle from discussion group to discussion group. When discussion ends, the participation method terminates (Axelrod 2000).

3.3 Criteria of participation method comparison

The comparison of these five structured participation methods comprise the basic argument that each method, while differing in procedure, assumes a particular understanding of deliberation – a participation imagination, wherein citizens become participants through particular activities and rationalized assumptions in a democratic process. In this section, comparison criteria are offered as a vehicle for laying claim to procedural differences (specialization for a particular task) amid assumptive similarity. As in any comparative study, the choice of criteria for evaluation immediately implicates the researcher in particular normalized notions of participation. However,

the usefulness of such a set of criteria for evaluation allows a somewhat systematic portrayal of similarity and difference in the way in which each sequence the procedures of deliberation. As such, these criteria of comparison are limited due to their situatedness within the participation imaginary of certain assumptions about 'power' and democracy. Therefore an understanding of procedural differences is really the extent to which such criteria are useful; to additionally unpack the assumptive similarities of the methods, a critical reading of these methods is needed (a topic which is visited in the following section). With this disclaimer worrying the work that this comparison performs, an introduction to the dimensions of comparison is appropriate:

- *Purpose* is a rationale for the participation process. This paper has explored participation methods as categorized by two particular purposes (as models): judgmental participation and organizational change participation.
- *Procedure* describes the known techniques required in implementation of a method. Techniques within participation methods can be further analyzed as participation primitives, i.e. basic steps in the process.
- *Expected outcome* is the intended product or milestone from the effective interaction within the participation method.
- *Iterative requirement* is the number of required interactions to accomplish the expected outcome of the participation method.
- *Size of group* is the number of participants that can participate effectively within the constraints of a setting.

- *Timing* is the expected length of the effective interaction session.
- *Facilitator presence/role* is the responsibility of the facilitator (if any) in the participation method.
- *Synthesis process* is the way in which synergies among participants' ideas are identified and moved forward during the participation process. Potential for greater participant empowerment resides in the details of this process.

These criteria help to distinguish these five participation methods as different procedural-based participation structures (as is shown in table 3.31, for review of the details of each method). Each participation method demonstrates a different sequencing of activities, as brought out in the comparison along the criteria of procedures. However, each broadly represents a similar imagination of participation steeped in economic and communicative rationality where participants evaluate costs and benefits to determine appropriate decisions and are assumed to have the ability to come to an understanding with other participants. As was hinted to earlier, within a constitutive rationality of the political we cannot assume that such a situation actually would in fact exist.

Table 2. Comparison of five structured participation methods.

	Nominal group technique	Delphi process	Citizen panel / citizen jury	Technology of participation	Open space technology
Summary	NGT is a structured form of brainstorming or brain-writing, with up to 10 participants and an experienced facilitator (or up to 3-4 groups of up to 10 participants, with a spokesperson for each group and a single facilitator overall) (Mycoted 2003)	Delphi is a series of questionnaires, each building on the responses of previous questionnaires, which requires a panel of participants to synthesize and determine the nature of follow-up questionnaires. (Delbecq, Van de Ven, and Gustafson 1975)	Citizen panel / jury provides an opportunity for citizens to learn about an issue and deliberate together to find a common ground solution and is also described as a consensus conference. (Jefferson Center 2004; Sclove 2000)	Technology of participation is a multi-method, participatory process of defining a context, brainstorming, ordering, naming, and evaluating. People are selected based upon a stake in the development and/or implementation of a strategic plan. (Spencer 1989)	OST allows participants to formulate a structure for discussion by extending the notion that out of chaos comes order.
Purpose	To create a document of ideas negotiated by the decision-making group.	To create a consensus document with ideas synthesized by panel of experts.	To reach consensus through jury members' negotiation of positions around evidence.	To create a consensus document expressed through idea negotiation of a participant group.	To reach a shared understanding through several deliberations led by individual participants.
Procedure	Goal statement Brainstorm ideas Clarify/negotiate ideas Vote on idea priority	Goal statement Generate ideas Collect ideas Synthesize ideas Playback ideas Request for further change	Listen to evidence Discuss evidence Negotiate positions Vote Repeat until reach consensus	Goal statement Generate ideas Collect ideas Cluster ideas Synthesize ideas Label ideas Negotiate idea priority	Goal statement Claiming a topic Choose a topic Discuss Iterate topic groups Exhaust topics
Expected outcome	Plurality document (majority agree)	Consensus document (100% agree)	Consensus document (100% agree)	Consensus document (100% agree)	Plurality document (majority agree)
Iterative requirement	One session	Multiple sessions	Multiple sessions	One sessions	One session
Size of group	5-20	10-100	20-50	20-50	20-50
Event duration	1-2 hours	1-2 days	2 days to 1 week	4 hours	1-2 hours
Facilitator presence and role	Facilitator records ideas for entire group to view. When using multiple groups, a facilitator is needed for each group, as well as an overall facilitator.	Panel of experts synthesizes ideas (based on participant ranking) for presentation to participants.	There may be an individual who provides organizations and structure for the meeting, but actual assistance in the idea generation/negotiation is minute.	Facilitator displays ideas for entire group to view, and assists the group in determining how to cluster and synthesize and label. (Spencer 1989)	No presence of facilitator
Synthesis process	The entire group performs synthesis.	Synthesis occurs with the panel of experts.	No formal clustering or synthesis of ideas occurs; group may discuss/debate until consensus is reached.	The entire group performs synthesis.	Synthesis occurs in near real time at the discretion of the discussion group leader and participants.

3.4 Specialization and similarity

In implementing the criteria described in the previous section to compare five structured participation methods, two themes seem to emerge: specialization and assumptive similarity. 'Specialization' refers to the procedural differences of the five methods, due simply to the fact that each was developed to support group processes in a particular substantive situation (e.g. generating an 'expert' opinion for locating an alternative energy factory; or gathering a response for a proposed merger). Each method offers a particular ordering of a specific set of the following procedures (see table 3.31):

1. *Goal stating/context setting*: This activity allows participants the opportunity to provide context for the events to follow, including deliberation on a proposed agenda.
2. *Brainstorming/generating ideas*: Participants are encouraged to submit multiple ideas over a period of time to contribute to the decision situation.
3. *Negotiating/clarifying ideas*: Participants discuss generated ideas, and in the process clarifying the idea for the entire group.
4. *Clustering/synthesizing/labeling ideas*: As participants negotiate and clarify ideas, some ideas may be clustered and merged with other ideas in a synthesis process. Clustered ideas may be given a new name or label.

5. *Voting/prioritizing*: Voting and prioritizing can be used to gauge participants' objectified priorities during a decision situation, especially in the case of very large groups.
6. *Surveying*: A survey may be used to gather a more subjective response (in relation to voting/prioritizing) from participants during a decision situation, especially for very large groups.
7. *Reviewing/evaluating*: Participants review and evaluate a decision-making process as a way of providing feedback or becoming more informed about the process.

The realignment of these procedures would inform the specialized practice of PPGISc as a schema for structured participation. The usefulness of the comparison criteria allows a view of these separated activities, while forming the backdrop for a critical reading of the possibilities for structured participation.

This thesis argues that the positioning of 'power' within structured participation is of crucial importance to the practice of PPGISc, more specifically that the notion of 'power' within methods of participation is largely that of simple capacity; therefore, discussion cannot end at the simple procedural comparison of structured participation methods. The way in which this comparison draws out the assumptive similarity of all five methods compared here is important to the unpacking the particular positioning of 'power'. All methods employ an idea-generation process, whether through brainstorming, arguing evidence, or staking a claim to particular topics for discussion. Each activity assumes a participant is motivated to present ideas

in deliberation toward a shared understanding (consensus). The methods assume a certain Habermasian perspective of underlying validity and understanding, where 'power' is checked at the door and participants assume a leveled, depoliticized playing field. The methods seem to exhibit procedural characteristics of three models of democracy: participatory, deliberative, and communicative (as articulated by Young (1996; 1997) to be distinct from the deliberative model). However, the entire project of structuring participation (as captured by this comparison of five methods) enforces a particular notion of 'power' informed by classic pluralism. Therefore, particular democratic models chosen by PPGISc researchers inform the strategy of participation, as well as determines the way the political is (re)constituted. What is needed is a discussion of these democratic models which confronts 'power', in order to fully situate a comparison of structured participation methods.

Confronting 'power' within methods of structured participation

Several questions should be posed for a theory of participation within PPGISc, including implications of a constitutive politics and a destabilized and multiple conception of 'power'. The comparison of different methods of structured participation has demonstrated the procedural differences of each method; however, the limitations for implementing these methods of participation in the practice of PPGISc was unclear, due in part to the foundational rationality (discussed as assumptive similarity) inherent to each method and the criteria that were formed to articulate their systemic differences. In this section, two approaches are taken to

worry these foundations: 1.) the relationship between the five methods of structured participation and models of participatory, deliberative, and communicative democracy is discussed; 2.) the classic pluralist notion of 'power' is discussed as implicit within these five methods of structured participation.

The importance of this comparison is to realize the connections these methods make to models of democracy, to include participatory, deliberative, and communicative democracy. Participatory democracy, Cunningham (2002) writes, represents a turn toward consensus through decision-making and "democratic training" for a directly participating public. Participatory democrats saw institutions like voting as encouraging apathy, and offered the solution of consensus as an instrument to inspire political engagement. Deliberative democracy, like participatory democracy, is motivated toward consensus-building; however, deliberative democrats (e.g. Gutmann 1993; Gutmann and Thompson 2004) place an emphasis on deliberation informed by a Habermasian ideal speech situation, thus privileging formal argument as the mode of participation. Young (1996; 1997), in responding to the lack of a perspective of difference in deliberative democracy, describes communicative democracy as opening the form of dialog for participants, challenging a cultural bias toward formal argument.

The methods of structured participation could be said to exhibit characteristics of each of these models of democracy. By aligning these models with the intent to provide structured participation in the practice of PPGISc, the possibility for a greater understanding of the process emerges from inquiry within political theory; bridging

these disciplines necessarily brings about new perspectives for system development. All presuppose the ideal situation where participants are 'directly' involved in decision-making; albeit that Delphi process and citizen panel/jury privilege an 'expert' panel as part of the group process. Each method has consensus (or likewise, consensus-building) as a desired outcome of the process, an ideal very much aligned with these models of democracy (especially deliberative and communicative). Likewise, each method assumes a Habermasian (1979) notion of universal understanding through that of a communicative rationality (comprehensibility, truth, truthfulness, and rightness), a notion true of each model of democracy analyzed here. It is important to note Young's (1996) critique of deliberative democracy which worried the notion of a prepolitical individual participating in consensus building to contribute to a common good. The notion of consensus, throughout these methods of participation and models of democracy inform an analysis of their theorizing of 'power' – one which I argue is actually rooted in classic pluralism.

Cunningham's (2002) reading of classic pluralism (cf. Dahl 1961) positions this normative theory (or utopia) as guided by empirical studies of *group interest* and an understanding of 'power' as an endless political resource used to persuade a governing body. Here, the notion of *group interest*, as a form of collective allows classic pluralists a way to describe political situations where individuals are empowered by becoming involved in as many organizations of *interest* as desired. The way collective *interest* is negotiated is bracketed off by classic pluralists (telling of their particular notion of 'power' in a depoliticized decision-making situation).

These methods of participation and models of democracy rely on this pluralist notion of 'power', where participants are expected to involve themselves based on their interest or perspective which is aligned with group interest. The drive toward consensus (although realized by these models of participation as being improbable) mobilizes a political 'we' and, therefore, a 'they', where individual differences (or goods) are put aside in return for a 'common' good. That which is common, or the group interest, is nondecided in this handling of power. Bachrach and Baratz (1962) level their critique at this problematic of who decides what *interests* are 'important' or 'unimportant'. They argue that a second face of power – non-decisionmaking – exists where the process itself disempowers the participant.

Barry Hindess, in *Discourses of Power*, traces the multiple dimensions of power, the first two described previously (that of simple capacity, or the power exercised over another, and legitimate capacity, or the power of the consent to be governed through non-decisionmaking), and articulates a third dimension of power (extending Lukes 1974):

> [T]here may also be instances of the exercise of power in which its victims fail even to recognize that their real interests are at risk, and consequently make no attempt to defend those interests. On this view, there is a third, particularly insidious, form of power which is able to influence the thoughts and desires of its victims without their being aware of its effects. (Hindess 1996: 5)

Certainly these methods of structured participation and models of democracy confront 'power' as a simple capacity, bracketing off the potential for multiple dimensions of 'power'. The problem with this notion, Hindess continues, is that of the indeterminacy of conflict. The simple (or quantitative) capacity of 'power' assumes

conflict to be calculable, a "simple product of initial conditions" for a prepolitical group of individuals. This is the largest limitation for methods of structured participation which handle conflict in this way. By broadening the way 'power' is confronted, the potential for a practice of PPGISc seems very promising.

Futures for structured participation in a PPGISc

Asynchronous, online versions of the five structured participation methods compared here might look very similar due to the participation imagination that I argue each employ, based on a notion of 'power' as simple capacity in a depoliticized decision-making situation. PPGISc must come to grips with the way procedures imply a depoliticized political in ways that potentially undermine democracy (electronic or otherwise). Frissen (1997) recognizes the depoliticizing effect of increased procedure and structure of the political:

> The traditional centralist model of steering, based upon the idea of a rational actor, planning and deciding from one point, is substituted by a model that honours differentiation, variety and pluralism, while not considering these as limitations to be overcome. (Frissen 1997: 118)

Frissen's frustration is certainly pertinent here, having reviewed methods of structured participation; the advent of participatory decision-making using methods of structured participation to support a differentiated public invokes a notion of the political where 'power' is often removed from the equation, or as mentioned in the previous section, where any conflict is pre-calculable. By leaning on consensus as a motivation for participation, the practice of PPGISc may be open to critique, following Weber

(1946), that the increased organization and bureaucracy of society's institutions undermine the democratic project (cf. Ferguson 1984).

Critics of PPGISc might argue the necessary 'oppression' inherent to democratic projects using instruments of consensus as the operation of participation, for reasons articulated in the previous section (having to do with the way 'power' is handled). Oppression, detailed by Cunningham, occurs through mechanisms like voting, whereby participants are involved passively, due to a lack of "knowledge, … skills, … [and] expectations for taking charge of their lives" (2002: 133). Participatory democracy arrives as a supposed way to quell this problem, through the use of direct (problematically assumed to be 'active') participation. Through direct participation, individuals are supposedly transformed out of irrationality towards a "civic-minded citizen" capable of the knowledge, skills, and expectations needed to break free of oppression (2002). The response then, offered by theorists of participatory democracy (and assumably deliberative and communicative models), moves away from democratic procedures such as voting and towards consensus through group decision-making. However, Cunningham's analysis of oppression assumes a simple capacity notion of 'power', limiting his argument to a notion of the political within that single dimension. In addition, the notion that individuals are trained to escape oppression, through a "leveling of economic and social differences", is how bureaucracy is introduced, according to Weber (1946). The increased organization of society leads to bureaucracy and the development of tools of oppression.

However, just the opposite may also be true, as Ferguson (1984), in articulating a feminist project against bureaucratic organization, realizes the potential for participatory decision-making to develop strategies and "structures for coordination among the groups" (Ferguson 1984: 207). A fine line certainly exists for PPGISc to either contribute to an already existing bureaucracy of hierarchy and control, or contribute to the dismantling of bureaucracy through egalitarian practices of small group participatory decision-making. The decision rests on how practitioners and developers of PPGISc choose to investigate methods of participation, by confronting a multi-dimensional 'power' and realizing how these structures handle conflict.

This chapter has argued that the development of asynchronous methods of structured participation to support online, decision-making within the practice of PPGISc should realize the way 'power' is confronted. A comparison of five methods of structured participation was used to illustrate procedural differences amid assumptive similarity, later showing that this similarity premised on an understanding of 'power' as simple (or quantitative) capacity largely limits any democratic project. Finally, recognizing an underdeveloped, normative handling of race, class, gender, sexuality, etc. in this research, I hope to have shown how a depoliticized decision-making situation potentially emerges from procedures and structures leaning on particular participation imaginations, potentially inviting additional critique for the numerous ways each are performed within these spaces.

Conclusions

> But to deepen our understanding of the impact of GIS as technology, object, practice, and social relation, it will be necessary to broaden the context within which the disciplinary history is written. (Pickles 1995: 237)

This thesis has been an attempt to articulate an appropriate response to *Ground Truth* within the discipline of PPGISc, by calling into question the notions of 'power' PPGISc employs in research and practice. As Pickles (1995) writes in the above quote from *Ground Truth*, some types of investigation will require a broadened academic context for theoretical and methodological support. In the introduction, I detailed the different perspectives of a validity network schema for PPGISc, wherein a particular perspective of theoretical, methodological, and substantive domains allows for such a broadened context for investigation. Chapter 2 was a discourse analysis of *Community Participation and GIS*, attempting to call attention to the notions of 'community' within PPGISc research and practice. Chapter 3 presented a comparison of structured participation methods, unpacking the underlying theoretical assumptions located in this particular exercise, questioning the depoliticized character of instruments used to support democratic decision-making.

Drawing on the approach Brown and Staeheli (2003) presents for unpacking a constitutive approach to feminist political geography, a future for PPGISc continues to be advancing systems which realizes political struggle, while investigating the various ways any system has contingencies, outcomes, and implications (252-253). In this thesis, I have explored instances in which a simplistic notion of 'community' implicitly assumes a quantitative notion of 'power', culled through discourse analysis,

emerging from a comparison of methods of structured participation, as a strategy to begin to question these implications, outcomes, and contingencies. Certainly, I do not propose that this has been a comprehensive investigation; however, I have intended to demonstrate two approaches for PPGISc researchers to begin to worry our assumptions of political 'power' in both research and practice.

Therefore, I have argued that *Community Participation and GIS* represents a discourse legitimizing a rather simplistic notion of community as a theory of participation. This discourse analysis has drawn out the intertextual relationships between the CPGIS narrative and recent works of PPGISc researchers to reveal a need to visit and revisit how these assumptions about 'participation' inform future system development situated in new theories of PPGISc. Likewise, I have shown how the development of asynchronous methods of structured participation to support online, decision-making within the practice of PPGISc should realize the way 'power' is confronted. A comparison of five methods of structured participation was used to illustrate procedural differences amid assumptive similarity, later showing that this similarity premised on an understanding of 'power' as simple (or quantitative) capacity largely limits any democratic project.

A broader set of questions regarding the normative handling of race, class, gender, sexuality, etc. within the depoliticized situations that much of PPGISc research and practice envision would be a much larger project, and yet one which PPGISc needs to confront to more fully understand the constitutive approach to understanding political struggle. Additionally, the ways in which these norms are

inscribed in the spaces of decision-making describe a larger project as well, certainly one that geographers would be well aligned with. This thesis has attempted to provide an example of PPGISc research and practice engaging with these discussions in feminist and political theory, and should be seen as a mere glimmer of potential in rearticulating an agenda for PPGISc, one that theorists and practitioners can hopefully find useful.

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