I. Introduction

On April 17th, 1997, over 30,000 people marched through the streets of Brasilia in a historic demonstration of support for one of the largest grassroots social movements in Brazil's history - *O Movimento Dos Trabalhadores Rurais Sem Terra* (MST - The Rural Landless Workers' Movement), now considered by many to be the only successful opposition to the Brazilian government (Beto 1997). Created in 1984, in the wake of a repressive military dictatorship, MST has since helped to establish over 145,000 land reform settlements by mobilizing members to occupy “unproductive” land and pressuring the government to negotiate for title to the property. Arguably one of the most important examples of the "new land reform" in Latin America (Petras 1997a), studies of MST have focused primarily on the movement's history (e.g., Fernandez 1994), its political importance (e.g., Ferrante 1994; Petras 1997b) and socio-political relations within the individual settlements (e.g., Cazella 1992; Torrens 1994). Although these studies are important, they all analytically separate the economy and society into two distinct spheres ignoring Leite's (1992) appeal for a general study of MST and settlement production practices. Therefore, I propose to study the interplay between economy, society and place by examining the social networks that link MST settlements nationwide, creating socio-economic resource pathways with important production consequences. Networks are fundamental to the struggle for effective, self-sustaining land reform because the sum of individual knowledges and resources is greater than the parts - or, as MST says, a fist is stronger than five fingers.

Building on my work with MST over the past four years, I will address three key questions: 1) What are the structure and function of MST's networks? 2) How are the networks actually produced and reproduced by local and regional characteristics (specifically between the Northeast and the Southeast of Brazil)? 3) How do these diverse networks in turn affect production on the settlements?

In relation to these questions, my three central hypotheses are: 1) The networks are structured by the flow of information, people and resources between the settlements, linking the dissemination of MST's ideology with the dissemination of important market information such that each attempts to legitimate the other. 2) The networks do not simply incorporate these flows, rather they reflect local and regional characteristics that result in complex processes of internal negotiation. 3) The networks have different production effects depending on the region in which they are situated. In the Northeast, the networks provide substantial production benefits because continual contestation along the links institutionalizes democratic channels of communication and allows the settlements to respond flexibly to changing production demands. In the Southeast, where the network resource base is richer, pressure to conform to social norms often results in the adoption of formulaic production models that stifle socio-economic flexibility and have unfavorable production consequences.

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1Parallel research that does examine the viability of the settlements as production units, has not specifically analyzed the influence of MST (e.g. FAO 1992; Romeiro 1994; Zamberlam 1994).
2In this study, networks are defined as ties among actors who share information, advice or resources which are not simply passed along the links but subjected to a variety of interpretations and contestations.
3Although I argue that these general trends and patterns are evident, the great variety among and within settlements makes it difficult to form absolute hypotheses.
This research project will contribute to three major theoretical literatures. It will contribute to the growing body of work on networks and embedded economies by introducing a geographic perspective that broadens our understanding of network formation as a continual process influenced by the places in which the communities are situated. This project will also add to recent literature on the efficacy of the 'new' land reform in Latin America because it is the first to recognize that networks are a key component of production on settlements affiliated with MST. Finally, this project will contribute to what has been called the 'new agrarian studies' that analyze rural transformations as produced by specific historical trajectories.

II. Theoretical Framework
The theoretical framework that informs this study integrates three important fields of inquiry. The new economic sociology literature specifically addresses networks and offers sophisticated tools for quantifying network structures. The weaknesses that exist in this literature are approached in useful ways by recent theories on the importance of place that have come out of social geography. Drawing on both these fields, the agrarian studies literature is particularly relevant for analyzing dynamic rural processes.

1. The new economic sociology is based on a recent re-formulation of the idea that the economy and society are mutually embedded (cf., Polanyi 1944; Granovetter 1985). Although the literature now largely takes embeddedness for granted, it is not always clear how this happens. Confronted with a messy reality, analysis of social networks has provided a relatively tidy framework for mapping out the effect of social resources on economic decisions. In a seminal piece, Granovetter (1973) argued that "weak", distant ties provided greater access to economic information than strong, intimate ties (see also Burt 1992). Although the affection implied by a strong tie was likely to be greater than in a weak tie, the latter would have access to information that individuals - and their close friends - did not. Parallel research on social roles likewise directed attention towards the importance of multiple ties - or "complex role-sets" and "multi-group affiliations" - that alleviated the negative effects of peer pressure while enhancing opportunities for intellectual growth (see: Blau and Goodman 1995). Recent studies in network analysis continue to elaborate on this early work to show how networks use "cultural capital" to build trust among diverse, widespread groups (cf., Nohria and Eccles 1992). Trust is a key component of networks, although the literature is unclear on exactly how to define this quality. Some authors skirt the issue by asserting that linkages somehow inherently imply - or engender - trust (Powell, 1990). Marsden (1990) argues that the "cognitive legitimacy" of (or trust in) a network increases relative to its presence in a given community. Increased cognitive legitimacy, in turn, attracts more potential network members which further boosts the network's 'social capital' (Burt 1993). Social capital has been defined as the norms and networks that constitute valuable economic assets while operating outside of the formal economy (Evans 1997; Putnam 1993). Although social capital may not be a sufficient condition for economic growth, it is certainly necessary: "if people cannot trust each other or work together, then improving the material conditions of life is an uphill battle." (Evans 1997:2)

While network theory is a useful tool for analyzing networks on and between MST settlements, serious weaknesses exist in the research. Most obviously, network analysis emphasizes 'regional economies and industrial districts' in the developed world (e.g., Powell 1990; Powell and Smith Doerr 1994), ignoring the inter-dependent construction of rural and urban spaces as well as the rich material present in primarily agrarian regions. Research also needs to be conducted that recognizes the dynamic nature of network formation as an ongoing process characterized by struggle and negotiation. Conceptualization of networks as 'social capital' obscures their fluidity, porousness, and
contested nature. Networks do not always enable action, sometimes they constrain action - and the outward appearance of adherence to network norms may not be the expression of a consensus, but an attempt to create one (Sabel 1993). Likewise, networks are not efficient simply because they exist (a neo-classical economic assumption cf. Powell 1990); sometimes inefficient networks exist because "path dependent" conditions make change excessively difficult (cf., North 1990). These biases in the research come from taking networks as given and "reading off" values from the physical structure (Hart forthcoming:61). Burt (1993:69) also argues that network links are studied while the networks themselves - and their formation - are not.

2. A useful tool for understanding network formation, rather than simply network structure, comes from treatments of "place" in social geography. Much of the literature on place originates in political economy's perceptive characterization of capitalist development as inherently uneven, creating, in Storper and Walker's (1989) words, "inconstant geographies". Although the transition from "Fordist" mass production methods to "flexible specialization" may have been overstated, the literature was sensitive to the ways in which the logic of capital manipulated space (Piore and Sabel 1984). Ironically, however, the attention to space resulted in generalizations that severely underestimated the power of place (cf., Goodman and Watts 1994). In more recent work, Massey (1994a), argues for a place-based interpretation of communities, suggesting that institutions such as networks incorporate general information in a way that is based on local characteristics although not determined by them. Understanding the process of network formation requires this appreciation for the importance of local - and inconstant - geographies. Particular localities do not simply accept external influences, rather the two interact continuously such that - like snowflakes - no two places are ever the same. The difference between levels of analysis - between space and place - are crucial to this study. I conceptualize space as the area through which general information is transmitted and place as the specific location in which that information is interpreted. This is different from Harvey's definition which describes places as enclosed and space as open and interactive (Massey:1994a:115). Places are always open, porous "subsets" of the larger context (Hart 1992; Massey: 1994a).

The networks between MST settlements, for example, under-go a process of formation and re-formation as the movement expands throughout spatially Brazil, encompassing geographic places that have very different socio-economic historical structures. Clearly, these regional characteristics affect the formation of the networks, although little research or conceptual work has been done on how this occurs. Harvey (1989:302) has suggested that: "the capacity of most social movements to command place better than space puts a strong emphasis upon the political connection between place and social identity". This argument, however, only holds true for social movements contained within homogenous social regions where the leadership, ideas and membership all come from similar places. When a movement occupies diverse places, Harvey's theory is turned on its head: in the case of MST, the movement is able to command space far better than place precisely because it is blocked by the strong connection between place and social identity. Communities often accept MST's general beliefs which can be translated into the local "ideologies", while resisting specific suggestions from leaders and militants who are clearly foreign to the locality. This plays out in interesting ways on land reform settlements in Brazil. In the Southeast, for example, information regarding material resource gains is often intricately disguised, interpreted and accepted as information regarding ideological meanings (Zimmerman 1994), while in the Northeast information that is interpreted as ideological is often rejected by the settlers or viewed with suspicion regardless of its valuable material benefit.

3. The third field of literature that informs this project provides the specific tools for analyzing what is new about the 'new' agrarian transformations taking place in Latin
America (Petras 1997a) by elaborating on the older agrarian studies literature that blossomed during the late 1960s and 1970s (cf., Shanin 1987). One of the most relevant and important writers at that time, De Janvry (1981), invoked the classic authors of the "agrarian question" in order to analyze the nature of the peasantry in Latin America after the reforms of the 1960s. De Janvry argued, as Lenin did almost 100 years earlier, that capitalism would eventually penetrate agriculture in the same way that it had penetrated industry, resulting in increasing differentiation between the bourgeois and proletarian classes (Lenin 1899). To explain the peasantry's awkward persistence (Shanin 1972), De Janvry incorporated Kautsky's (1899 [1989]) modification of Lenin's work to argue that maintaining the peasantry in a subordinate position was not theoretically necessary but would continue for as long as it was functional to capitalism. Peasants were functional to capitalism because they produced many of their own agricultural needs which enabled them to work for wages that were lower than the cost of their subsistence. These classic authors, embodied in De Janvry's work, were important in emphasizing class relations as key to understanding the nature of the peasantry and in emphasizing the diversity of paths that history forced capitalism to take in the countryside (cf., Hart forthcoming).

The 'new' agrarian literature has elaborated on De Janvry's presentation of the classics by analyzing reality as a continual process taking place on multiple levels of society and place (cf., Watts 1996), and incorporating a sophisticated understanding of power into theorizations of agrarian histories. Power is a crucial variable when access to resources depends partly on one's position within a social network and on the intricate relations that develop between network members (cf., Berry 1993). Power in this sense is not confined to a limited understanding of class, but incorporates status qualifiers such as gender (cf., Watts and Carney 1990), citizenship (cf., Thomas 1985) and social position (cf., Berry 1993). "A key insight [from the new agrarian studies] is that struggles over material resources, labour discipline, and surplus appropriation are simultaneously struggles over culturally constructed meanings, definitions, and identities," (Hart, forthcoming: 62). In an ironic way that reflects the existence of multiple paths, struggles over meanings between actors with differential levels of power do not always have predictable outcomes (Ibid.). According to Berry, the process of struggle may even become institutionalized in a positive way: "if access to resources and opportunities depends on one's ability to negotiate, [and] people may be more interested in keeping options open than cutting them off, and in strengthening their ability to participate in and influence negotiations rather than acquiring exclusive control over resources..." (1993:14).

III. A Case Study of Networks and Land Reform in Brazil

Land reform in Latin America has largely been considered a dead issue since the old enthusiasm of the 1960s was buried by the oppressive military dictatorships that swept into power across the region. Today, however, land reform is alive once again - ironically, in what is considered one of the most 'developed' countries in the region - Brazil. The initiative for land reform now comes not from the government, but from small communities of squatters that have been organized nationally by MST. In the 13 years since its inception, MST's membership has gone from 400 to over 500,00. According to one observer: "MST is the most dynamic, best organized and effective social movement in Brazil today." (Petras 1997:18) MST's methods are unorthodox but effective. Members known as "militants" travel throughout Brazil, primarily among the urban poor and Catholic communities, informing people of their constitutional right to land that is considered unproductive (Stedile and Sergio 1993). When a community of members has been formed, one of their main goals is the organization of an "occupation." Aside from the land occupations, MST also organizes general demonstrations in favor of land reform, nation-wide marches, and occupations of important political offices (Torrens 1994).
As MST has increased in importance and size, it has also increased its geographical scope to incorporate diverse regions such as the Southeast and Northeast of Brazil which possess strikingly distinct socio-economic structures and agrarian histories, creating innumerable local differences on MST settlements in the two regions. Three of these differences are important for this study: the production backgrounds of the settlers, personal ideas of community, and local market development.

In the Southeast, a majority of the settlers are descendants of Europeans who immigrated to Brazil in the 1800s and worked on the land as small family farmers for several generations (known as colonos). Families in the Southeast are still small today although relatively homogenous ethnic communities have filled the role of extended kinship groups. Markets in the Southeast are well developed due to the proximity of South America's largest urban centers. Most production relations have been commodified and few families operate outside of the market. In the Northeast, however, the dominant agricultural production regime has historically been the plantation which created a large population of subsistence farmers that existed in a subordinate position to the landed elite. Although plantations are not as common today as they were 100 years ago, they have left a legacy of individualism and isolation. The farmers maintain a tradition of working for survival - keeping their heads above water - and have little contact with the surrounding community. Personal relationships in the Northeast tend to be vertical (hierarchical), as between patron and client. The subsistence nature of production and vertical nature of relationships are supported by the lack of market penetration into the countryside. Few urban centers exist in the area and infrastructure remains at a minimum.

The regional differences between the Northeast and the Southeast are reflected in the formation of different types of networks that are more or less effective in increasing production value on the settlements. The networks that run between and within MST settlements across the country are bounded loosely by membership in the movement, although the network includes contributions and resources from outside actors such as the state, local business people or private institutions. Information is passed through the network by militants who are chosen for their commitment to MST’s socialist ideology and their ability to express that ideology to others. The militants are the primary conduits of information from MST headquarters as well as important sources of practical market information. The settlers themselves form an internal network as they share information over meals, during soccer games and in the fields. One of the ways in which the different production backgrounds of the settlers have resulted in variable network structures is demographic. In the Southeast, the members of MST tend to be the younger children of colonos who were unable to subdivide their land to support their all of their children's families. In the Northeast, the members of MST tend to be older as poverty robs people of their old-age security. The demographic differences in the networks have important ramifications on the efficacy of the networks. The negative correlation between age and commitment to radicalism has been well documented (cf., Pakulski 1993: especially 144-146), and there is a noticeable tendency for people in the Northeast to resist incorporating new information that is interpreted as ideological regardless of its valuable material benefit. For example, MST promotes the cooperative organization of labor in production for reasons of both socialist ideology and market competitiveness. In the Northeast, it has been difficult for MST to transmit information about cooperative production as the settlers distrust and contest the underlying ideological aspect and the incorporation of new information. In the Southeast, however, the younger settlers tend to be much more open to

4For example, MST prefers that settlements affiliated with the movement organize production communally. This is justified on a largely ideological basis but it is grounded in solid competitive advantages such as economies of scale, greater division of labor etc.
information regarding cooperative production which is often publicly accepted on the basis of its ideological importance. The material benefits from economies of scale and rationalized divisions of labor are treated as secondary.

A second regional difference that results in variable network structures is the interpretation of community solidarity in the Southeast and Northeast. In the Southeast, the partial surrendering of individual autonomy to a tight network falls within the traditional ideas of community and shared power. This has production advantages in that settlers will invest heavily in the networks and incorporate new information that flows across the links. This also has production disadvantages, however, because the settlers are under considerable pressure to accede to network norms that promote a fairly rigid model of production supported by MST. According to the ex-Minister of Land Reform for the state of Sao Paulo, rigid production models often contribute to economic difficulties on settlements because the settlers cannot adapt flexibly to economic changes (personal communication, Da Veiga 1997). In the Northeast, conversely, joining a network is approached with skepticism and caution as a result of the stress on self-sufficiency as a survival strategy in the face of extreme poverty. This complicates the already difficult task of building trust in the Northeast and results in intense negotiation over the establishment of every network link. I argue, however, that this negotiation has surprisingly positive production effects as the ongoing process of contestation opens up channels of communication and institutionalizes democratic organizing principles (cf., Berry 1993). The democratic nature of networks in the Northeast allows the settlers flexibility in their reactions to sudden economic changes.

IV. Research Design
The crux of my research design lies in the comparison of regional networks (Byers 1995). Comparative studies focus on one “explanatory” variable which allow the researcher to "make [an] initial causal inference by examining the differences in the distribution of outcomes on the dependent variable for given values of the explanatory variables" (King et al.:1994:140). In my study, geography is the explanatory variable and the dependent variables are network formation and performance. The research is divided into two phases during which I will gather information on a total of six settlements (three from each of the two regions). The settlements average between 30 to 40 families and were established between 1990 and 1992. They were chosen during pre-dissertation research because they are both relatively representative and relatively similar, allowing me to control to some extent for explanations external to the study as well as contrast my results with quantitative data from national level studies such as The First National Agrarian Reform Census taken in 1996. My methodological tools during both phases of research will include: observation; structured and unstructured interviews; quantitative network analysis based on a module designed by Burt (1984); qualitative "mapping" of spatial network structures and, finally, analysis of production resources on the settlements. All structured interviews used for survey purposes will involve a 100 percent sample set on the six settlements as I will need significant data to smooth out individual variations. I estimate that each household has 1.75 adults, so that a 100 percent sample set covers approximately 184 individuals per region. All semi and un-structured interviews will involve 25 percent sample sets which equals roughly 25 people per region. Although these data goals are ambitious, I believe that having established contacts on the settlements will assist me considerably.

5From previous experience, I estimate that one quarter of all household consists of only one adult. I will not include children (under 18) in this study.
Using these methods, I will be testing three hypotheses:

1) The networks are structured by the flow of information, people and resources between the settlements, linking the dissemination of MST’s ideology with the dissemination of important market information - such that each attempts to legitimize the other.

2) The networks do not simply incorporate these flows, rather they reflect local and regional characteristics that result in complex processes of internal negotiation.

3) The networks provide substantial production benefits in the Northeast because continual contestation along the links has institutionalized democratic channels of communication and allows the settlements to respond flexibly to changing production demands. In the Southeast, where the network resource base is richer, pressure to conform results in adoption of formulaic production models that stifle socio-economic flexibility and have unfavorable production consequences.

In order to illustrate how my proposed research design will address these hypotheses, I will state the question behind each hypothesis and explain the methods necessary to answer them.

1) What are the structure and function of MST’s networks? This information is essential for defining the term “network”, which is often used vaguely in academic work. As Rootes says of social movements, and which also applies to networks: "It is often unclear when they begin or end, who is in them and who is not, whether they exist to achieve a specified goal or to gratify some more general interest of their participants..." (Rootes 1987:2, quoted in Pakulski 1993:132-2) Defining network attributes involves observation and structured interviews that will be incorporated into an analytical design established by Burt (1984) and mapped spatially. I will observe the settlers’ production methods, their interactions with each other, their interactions with people outside of the settlements and interaction between the settlers and MST “militants”. Structured interviews will also be carried out with all of the settlers and militants on the settlement according to a design introduced by Burt (1984; 1992). I will ask each person on the settlement to name the people from whom they have received information regarding production decisions. Then I will ask them to describe their “informants” on the basis of: i) status within the movement; ii) ethnicity; iii) age iv) relation to themselves and v) degree of intimacy. During the data analysis phase, the answers will be coded so that I can test for correlation among the variables using a simple chi square test. I will superimpose a diagram of the network links onto a log-scaled map of the country for a spatial perspective of the network structure. This information will allow me to characterize the networks on the basis of three essential criteria: pattern (i.e., hierarchical vs. vertical relationships); diffuseness (i.e., spatial spread of ties); and richness (i.e., density, redundancy and intimacy). In order to understand how MST uses the network links to disseminate information and resources, I will collect data from the regional offices for Northeast and Southeast Brazil as well as in the headquarters in the city of Sao Paulo. I will study the information that MST provides for the militants to distribute within the settlements - usually in the form of informative pamphlets or workbooks - and read during group meetings. During pre-dissertation research I obtained permission for this sensitive research and know that it is feasible. Data will be gathered to calculate how many militants passed through the sample settlements, what their goals were, and what they officially accomplished. Semi-structured interviews will be conducted with the militants and MST leaders in order to determine what information the movement is trying to pass along to settlers, how they are presenting the information and how the information has been accepted.

2) How are the networks actually produced and reproduced by local and regional characteristics (specifically between the Northeast and the Southeast of Brazil)? To answer this question, I will focus on three key local and regional characteristics that affect network
formation: the production backgrounds of the settlers, normative ideas of community solidarity and market structure. Evidence regarding these three aspects will be obtained using a combination of qualitative and quantitative methods including: ethnography, structured and unstructured interviews, and more elaborate quantitative network analysis. I will conduct ethnographic studies of the settlers and compile research on their life-histories prior to joining MST as well as on their relationship with the larger group. I will carry out unstructured interviews to determine how relationships were made, how they are maintained, how information is transmitted and how it is accepted. This information will highlight how people invest in networks and how they interpret and define community solidarity. I will also enrich the network analysis described in the previous section (under question number one) by asking each person on the settlement to rank their ties on the basis of intimacy, describe their reasons for that ranking, and rank the information supplied by their ties on the basis of its utility. The local market structure will be assessed through local government documents, general impressions and academic studies of the region.

3) How do these diverse networks in turn affect production on the settlements? In order to answer this question, I will employ three methodological tools: observation, semi-structured interviews and quantitative resource analysis. I will observe what the settlers produce, how they are producing it, who offers assistance to whom and what type of assistance it is. The semi-structured interviews will complement my observations by formally asking the settlers to describe what they produce, how they are producing it, who offers them assistance and of what type. I will also ask what the individual would have done differently had they not received the advice they did. Finally, I will collect data on each settlements’ production resources and compile technical descriptions of how resource gains were achieved. Production data will be gathered in accordance with the example provided by the First National Agrarian Reform Census from 1996. By adhering to the questions and categorizations specified in the Census regarding resource types and quantities, I will be able to compare the six settlements where I will do research with the rest of the settlements in the region and in the country. This information will be analyzed in correlation models with the network data. Using simple regressions, I will be able to determine the ways in which network structures are correlated with production performances while attempting to control for physical differences. I will analyze the physical characteristics of the settlements on the basis of their topography, edaphic type, climate, and water sources. Study of spatial physical attributes will also determine the proximity of local markets, as well as availability of transportation and storage facilities.

V. Research Schedule:
Phase I: October 1998 - March 1999: My objective during this period is to gather information from three settlements in the southeastern state of Sao Paulo. During the six months, I will make several short trips to the city of Sao Paulo in order to examine the records kept at the main MST office.
Phase II: April 1999 - September 1999: My objective during this phase is to gather information from three settlements in the northeastern state of Sergipe. I will also travel to and from the main MST office in the state of Sergipe in order to access the data kept there.
Phase III: October 1999 - September 2000: My objective during this phase is to write up my dissertation thesis on the basis of the information that I collect. I will concurrently begin to look for an academic position in the US.

6 I will gather production data following the format provided by the First National Agrarian Reform Census from 1996. By adhering to the questions and categorizations specified in the Census regarding resource types and quantities, I will be able to compare the six settlements where I will do research with the rest of the settlements in the region and in the country.
VI. Research Preparation
Many of the necessary preparations for this research project were made during one year of pre-dissertation research funded by the Social Science Research Council. Beyond simply enabling me to become conversant in the Portuguese language, an affiliation with the Economics Department at the University of Sao Paulo introduced me to key people involved in research on agrarian reform such as Professors Jose Eli Da Veiga, Ricardo Abramovay and Jose Carvalho. The affiliation also allowed me to access important literature and original survey data available only in Brazil (e.g. The First National Agrarian Reform Census). I have visited several of the land reform settlements where I plan to conduct my research, met several of the militants and have received permission from MST to live with the settlers for the duration of my research. Because of the advice that I received from MST members, from scholars in Brazil and from professors at the University of California at Berkeley, I believe that my research offers a substantial contribution to the debate on the socio-economy of rural transitions.
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