Introduction

It has been argued by some authors that social theories of agency may benefit from a simulation modeling methodology (Gilbert and Conte 1995; Beekman 2005). In this paper, I take up this challenge by examining Giddens' *structuration theory* by creating a simulation model and running a series of tests designed to explore the assumptions, limits, and boundaries of the theory. The simulation model is based on Willis' 1981 ethnography, *Learning to Labor,* from which I extracted details of the cultural logic of his antagonists, "the lads." I chose this ethnography because it is considered by many authors to be an important ethnography of modern capitalist culture. Giddens (1984:288) commended it for "avoid[ing] impoverished descriptions of agents' knowledge ability; [and providing] a sophisticated account of motivation and an interpretation of the dialectic of control." Marcus (1986:167) used it in his contribution to "Writing Culture" as an important example of an ethnography that effectively grapples with the problems associated with understanding cultural decision-making among a group of people situated within a particularly modern capitalist context, and effectively negotiates the boundary between meaning and naturalism.

I created the simulation model based on ethnographic details from *Learning to Labor*. Willis' description of the industrialized world in which the lads lived constituted the structure of the model. I designed several tests to be run in this artificial world that would: (1) explore conditions under which the lads' actions could affect the industrial social structure in which they lived, (2) explore the conditions under which structural conditions affected the development of lad cultural values, and (3) explore the cultural conditions under which the lads could comprehend the structural conditions that underlay the exploitation inflicted upon them by the industrial capitalist system. I present results of these tests and I analyze them in the context of a critique of structuration theory.

It may seem paradoxical to some cultural anthropologists to use simulation modeling to analyze the cultural logic of a group of school-age boys from Birmingham, England. One might reasonably ask, how can simulation help our understanding of power? Although this is not yet a mainstream methodology in cultural anthropology, I do not argue its utility here as this topic has been discussed elsewhere by myself and others (Kiel and Elliott 1996, Small 1997, Gilbert and Troitzsch 1999, Downey 2005). Instead of addressing this question, I hope to support the utility of this approach by providing an analysis of power and agency based on simulation modeling.

Practice Theory

In the article, "Theory in Anthropology Since the Sixties," Ortner (1994) identifies *practice theory* as a broad category that aims to bring together such previously disparate theories as Marxism, history, linguistics, and cultural studies. What differentiates these theories from previous attempts to bridge individual agency and social structure is an acknowledgment that: (1) society is a system, (2) the system is powerfully constraining, and (3) the system can be made and unmade through action and interaction (Berger and Luckmann 1967, Ortner 1994). Some of the authors whose work falls into this category

include Bourdieu (1977), Giddens (1979, 1984, 1986), Archer (1982, 1995, 1996, 2000), and Foucault (1980, 1986). Agency is sometimes referred to as the ability, possibly unique among humans, to act purposefully and intentionally in the world. Ortner (1984:655) suggests that any theory addressing agency must address at least three questions: (1) what forces motivate individual action?, (2) how do structural characteristics shape individual action?, and, (3) how do individual actions shape structural characteristics? These three questions provide a useful mechanism for analyzing theories of agency and were used in this research to formulate the experiments conducted with the model.

Giddens offered an approach to agency called *structuration theory*. He suggested that, "structure has no existence independent of the knowledge that agents have about what they do in their day-to-day activity" (Giddens 1984:26). In structuration theory, social structures only exist through individual actions against negative structural properties or in concert with useful structural properties. Agents (really, people) are intelligent and knowledgeable about a limited part of their physical and social environment, and they have some level of awareness of its structural properties. They strategically use specific structural properties to fulfill their needs (Giddens 1984:25). Similarly, they are aware of how certain structural properties limit their lives, and they can act out to change these structural properties. These two elements of structural properties, enabling action and limiting action, constitute what Giddens called the *duality of structure* (Giddens 1984:9–13). According to Giddens, agency refers to an individual's capability to act rather than to their intentions (Giddens 1984:9). This refocusing tightly binds agency to power.

The duality of structure is Giddens' answer to questions two and three, posed above. The first question remains, however: what forces motivate individual action? Giddens suggested that the force underlying individual motivation is psychological anxiety. Anxiety in this sense refers to the knowledge that we, as humans, have about our world and its ability to provide our basic (and not so basic) needs such as food, shelter, and security. If we do not have these things, or if we do not have the means to get them, we feel anxiety. This anxiety then motivates us to mitigate the need that causes our anxiety. The individual, then, can invoke social structure to fulfill these needs and through these invocations, reinforce or alter the structure.

Giddens also discusses the unintended consequences of individual action. There are three circumstances that lead to unintended consequences: (1) single actions leading to a single unintended result (counterfactual analysis), (2) many actions leading to a single unintended result, and (3) institutional practices reproduced over time (Giddens 1984:9–14). It is important to note that for Giddens, unintended consequences *are not* emergent properties of social systems because the idea of emergence would suggest that social systems exhibit properties independent of agents, which would contradict the central tenet of structuration theory.

While acknowledging that social structures do exhibit a "mobilization of bias," structuration theory constitutes power primarily within individual action. "Power in social theory…is centrally involved with human agency; a person or party who wields power could 'have acted otherwise,' and, the person or party over whom power is

wielded…would have acted otherwise if power had not been exercised" (Giddens 1984:15). In order to understand power in structuration theory, two additional concepts must be introduced: *rules* and *resources*. "Resources…are structured properties of social systems, drawn upon and reproduced by knowledgeable agents in the course of interaction" (Giddens 1984:15). Rules are "…techniques or generalizable procedures applied in the enactment/reproduction of social practices" (Giddens 1984:21). In order to arrive at a coherent concept of power, the *duality of structure* is combined with *resources*. Giddens states that "power must be treated in the context of the duality of structure: if the resources which the existence of domination implies and the exercise of power draws upon, are seen to be at the same time structural components of social systems" (Giddens 1986:91). Power and domination are exercised through resources that are constituted and reconstituted through individual action. Ultimately, then, the individual is implicated with constituting the means of his own subjugation. The loci of *power over* the individual are actions of agents that reinforce the resources through which *power over* operates. So not only does structuration theory implicate the individual with self-regulation through this process, it opens up the radical potential of overthrowing structures of power through individual action, or what archaeologists Miller and Tilley refer to as *power to* (Benton 1981:176; Miller and Tilley 1984:5).

So what *is* power, according to Giddens? Ultimately power is the transformative capacity of human action. Subsumed underneath this is the capacity to get others to exercise their transformative capacity on one's behalf. *Power over* is a sub-category of transformative capacity in which "…an agent's transformative capacity is harnessed to actors' attempts to get others to comply with their wants" (Giddens 1986:93). Thus, for Giddens *power to* appears to subsume the concept of *power over*.

To better explain this argument, I will contrast Giddens' concept of power with Bourdieu's concept. Bourdieu's *habitus* focuses on how individuals possess a "durably installed generative principle of regulated improvisations [that] produces practices which tend to reproduce regularities" (Bourdieu 1977:78). For Bourdieu, the regulated improvisations are governed by the degrees of freedom within which agents creatively respond to their personal circumstances. All individuals have these internalized principles, and improvisations fall within what Bourdieu calls "the production of a commonsense world." This is not equivalent to social structure because these principles and improvisations are internalized, whereas social structures are external to the individual (Bourdieu 1977:80). Bourdieu leaves very little space for agents to act beyond the degrees of freedom expressed by the habitus. Exceptions to regulated improvisations are less frequently observed and individual creativity is constrained by a shared, undisputed discourse called *doxa*.

Moving from the realm of discourse and action to power, Bourdieu admits that the habitus can always be limited by external social structures, and the force that mediates this power relation is the cultural capital (economic, social, cultural, and symbolic) possessed by the individual. Social, cultural, and symbolic capital can be conserved, accumulated and converted into economic capital and is how Bourdieu expresses class differentiation. To frame Bourdieu's theory in Miller and Tilley's terms, *power to* is limited by habitus, doxa, and structural institutions. Whether an individual has *power*

over, in the form of access to social structures, is determined by an individual's access to cultural capital. For Bourdieu, *power over* subsumes *power to*.

To return to structuration theory we can see how Giddens locates the production of social structure within individuals' strategic actions, as opposed to Bourdieu who is more concerned with limits on agent's actions. Giddens' agents possess more creativity and capacity to secure their strategic goals because their actions create social structures. Again I use Miller and Tilley's terminology to summarize this argument: in Bourdieu's theory agents' *power over* subsumes *power to*; in Giddens' theory agents' *power to* subsumes *power over*.

Giddens' conception of power defines power as neither structure nor action. Instead it seems to be a concept external to the agency/structure dichotomy described by the duality of structure. He wants to "deal with structure as implicated in power relations and power relations as implicated in structure" (Giddens 1986:91). Power is conflated with agency and therefore it permeates structures.

By means of comparison, and perhaps as an elaboration on the relationship Giddens describes, let us consider a description of power offered by Foucault (Lansing 2003). For Foucault, there are two types of power. The first comes from outside and is imposed onto the individual in the form of disciplinary action, bodily control, and other more sophisticated forms of mass control. The second type of power is subjective in that individuals internalize the ideologies of power at a fundamental level of their being. This second type of power is closer to that which Giddens refers to, but Foucault's description is more nuanced. Foucault does not believe that a unitary theory of power could be created because of the temporal and historical characteristic of any instance of power. Instead, he suggests that the best social theorists can do is to create a "grid of analysis that makes possible an analytic of relations of power" (Foucault 1980:199). Power itself is not an object either real or manifest; "Power is not an institution, and not a structure; neither is it a certain strength we are endowed with; it is the name that one attributes to a complex strategical relationship in a particular society" (Foucault 1980:93). In this quote, Foucault's theory of power departs from Giddens' by denying that agents are endowed with "strength" or *power to*. Neither is it *power over* in the strict Weberian sense. Power is, however, that which Foucault identifies as a complex of relationships and can only be understood within the particular social and historical context of society or culture.

But like Giddens, Foucault travels into the individual's psychic constitution to identify the "self's relationship to itself" (Lansing 2003:374), what Foucault calls the study of *ethics*. *Ethics* in this sense are not the moral codes that presumably underlie western society, but rather the historically situated processes by which "knowable man is produced at the cognitive level" (Lansing 2003:374). The use of the term *ethics* implies Foucault's desire to emphasize the ultimate subjectivity of self's relationship to itself. It is within *ethics* that Foucault locates individual action and creativity. This process is primarily a conscious process in which the individual seeks to understand his relationship with others, dependence on others, independence from others, and "…of the ways in which it can establish a complete supremacy over itself" (Foucault 1986:239). Through this cognitive process the individual may be able in a limited way to modify—but never overthrow—the "regime of truth and power" that is embedded within the individual. In

this sense, Foucault shares more with Bourdieu's more conservative *habitus* than with Giddens' *structure*.

A fourth conception of power comes from Margaret Archer. She critiques structuration theory and suggests an alternative approach called *morphogenesis*. She implicates structuration theory for combining individual agency and social structure into a single recursive relationship that subsumes individualist and structuralist theories without providing an operational methodology. She suggested that Giddens' duality of structure casts too wide a net, which inappropriately captures contradictory entities: hyperactive agents and inviolable structure. The oscillation between contradictory images derives from Giddens not answering "when" questions: when can actors be transformative (which involves specification of degrees of freedom)? When are they trapped into replication (which involves specification of the stringency of constraints) (Archer 1996:87; Beekman 2005)? Despite her grievances with structuration theory, Archer agrees that social theory must explain the relationship between individual agency and social structure. She also agrees with other theories of agency which state that individuals: (1) must be recognized as active agents with partial knowledge about the structure of which they are a part, (2) must participate through their actions in producing and reproducing structure, (3) that structure both restricts and enables individual action.

Archer's *morphogenetic theory* is quite intricate and, for our purposes, the most important part of the theory is that it analytically separates agents from structure by placing more emphasis on understanding interactions among agents (see Archer 1995:247–293 for a complete description). Morphogenetic theory endows collectivities with both the transformative power and the strategic intentionality of Giddens' agents, while at the same time seeking to understand how collectivities emerge out of interactions among agents. Methodologically, morphogenesis implies the need for close examination of stratified levels of agent organization and how these levels arise out of agents' interactions.

Ethnography

The Dictionary of Anthropology defines ethnography as the "systematic description of a single contemporary culture, often through ethnographic fieldwork" (Barfield 2000:157). Underlying my research is the belief that simulation modeling is a useful form of ethnographic description that can be used to complement written ethnographies. Simulation modeling forces the modeler/ethnographer to "describe" the object of their attention in ways different from traditional textual methods of expression. As such, one might even consider simulation modeling an expression of the "experimental moment" in contemporary anthropology (Marcus 1999). For this reason it was critical to base this critique of structuration theory on observed social behavior, rather than explicitly on the theory. In other words, it was important to model an ethnography rather than the theory. I chose *Learning to Labor* (Willis 1981) to provide the social context to explore the relationship between agency and power primarily because Giddens (1984:288) used it to demonstrate the analysis of "strategic conduct" of individuals.

Learning to Labor describes the lives of a small group of boys from working class Birmingham and how their actions against their school have unintended consequences that drive them toward industrial jobs, and thus unintentionally filling a necessary, "functional" role in industrial capitalism. The purpose of *Learning to Labor* was to explore how working class kids "let themselves" get working class jobs (Willis 1981:1). Willis sought to understand this within the situated context of the school, which he speculated was the critical locus where boys construct their social identity as workers. Willis uses ethnography to explore how "the lads" interact with the social conditions within the school to mould themselves into workers. Willis comes to understand the cultural logic that underlies the lads' actions against their school, and how the unintended consequences of these actions drive them towards industrial jobs, and thus unintentionally filling a necessary role in industrial capitalism.

The lads rejected educational programs and mentoring experiences that would potentially have given them access to better, higher paying jobs. Willis cites this fact as one reason that functionalist explanations were insufficient for explaining their behavior. Such an argument would suggest that the lads took working class jobs because the economy somehow needed them to fill this productive role in the economy, thus giving agency to the economy rather than to the lads. This ethnography was written as a critique of simplistic functional social theories that deny human intelligence, agency, and free choice. Instead, *Learning to Labor* situates the critical juncture between individual experience and macro-level economic forces within individuals' actions, and based on cultural logic.

Part I of *Learning to Labor* is a textual ethnographic description and Part II is an analysis of the meaning and cultural processes described in Part I. In Part II, Willis introduces the term *penetrations* to identify ways in which the lads identify significant parts of the capitalist system that are dangerous to them and against which they react. The lads' penetrations of capitalism are synonymous with—and expressions of—the radical potential of working class culture. *Limitations* keep this radical potential in check; limitations are aspects of lad culture that prevent the lads from expressing their radical potential by rejecting working class jobs. Limitations are the cultural values and logic that enables the lad to choose working class jobs, and contribute to the differentiation between the working and middle classes. At the core of Willis' analysis, he seeks to explain why the lads' *limitations* overcome their *penetrations*. In brief, he suggests that the combination of class division, sexism, and racism combine to overcome their penetrations of capitalism (Willis 1981:145–154).

Willis questioned the extent to which the lads penetrate the capitalist system. He then asked why, if the lads understand how the industrial capitalist system uses them, do they continue to accept dirty, dangerous, low status, low wage working class jobs? He answered this question by providing an analysis of limitations that keep the lads from using their penetration of the system to act out against it. Among these limitations are class divisions, (especially those based on gender), an ingrained appreciation for manual labor (as opposed to mental labor), and racism (the existence of a West Indian underclass that is more seriously subjugated than the lads' white working class culture) (Willis 1981:145–154).

Simulation Modeling

The research consisted of creating two interrelated simulation models, Lad Culture and Industrial Business. Both were implemented in Stella® systems modeling software (Richmond 2001). The first model, Lad Culture (see Appendix A), focuses on the "the analysis of strategic conduct" (Giddens 1984:288). This model consists of an array of 12 lads who interact with people and institutions in their community. Willis identifies several values important to lad culture. In the model, I formalized these values into what I call *value-pairs*, which are based on ethnographic observations drawn from the text. Value-pairs are not strict structuralist binary oppositions, rather they represent generally opposing sets of cultural values held by different groups and individuals Willis encountered during fieldwork. The complete list of value-pairs is: masculinity–maleness, lad identity–conformist identity, belief in manual work–belief in mental work, and sense of social superiority–sense of social inferiority (Figure 1). A value-pair consists of two complementary integers x and y where $x + y = 100$ at the step in the simulation t_n. The initial values of x and y at t_1 are 50, and each can be modified throughout the simulation based on probabilities that certain interactions occur.

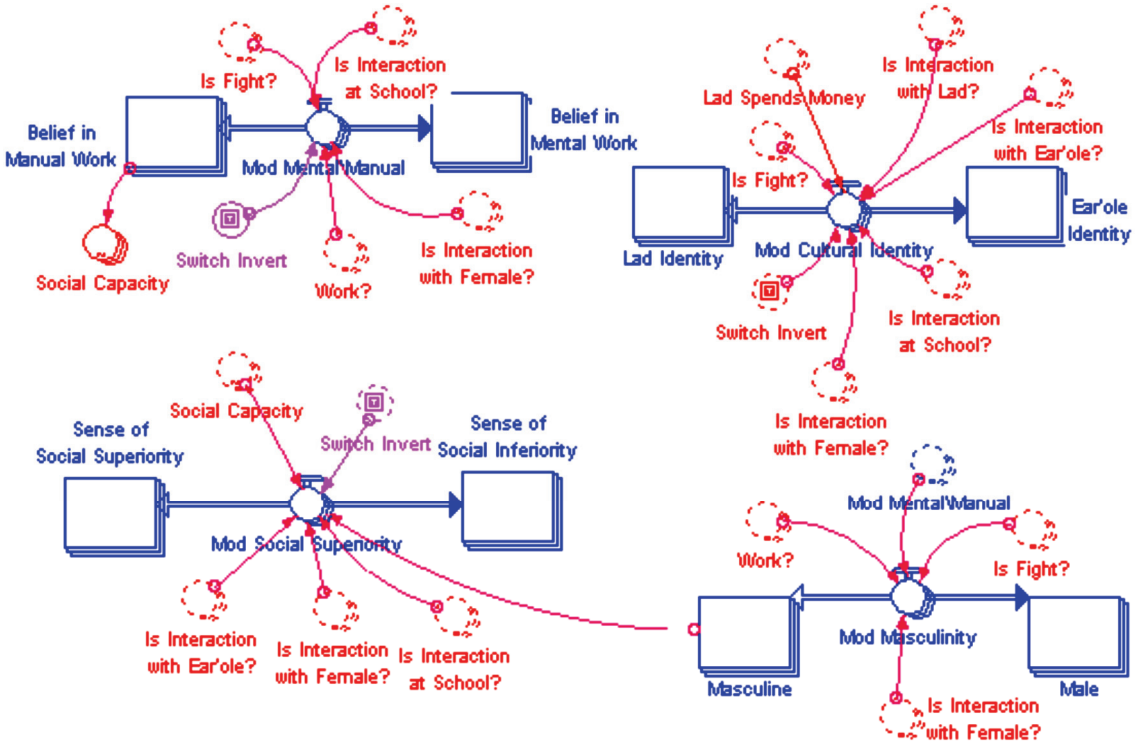


Figure 1: The four value-pairs and the daily interactions that affect them.

Consider, for example, how the lads view masculinity (x) and maleness (y). A boy can be perceived as male without having the characteristics normally associated with masculinity: toughness, ruggedness, and ability to do hard work (Willis 1981:110). The

lads, of course, strive to be masculine. Throughout the simulation each boy can be perceived as either masculine, just male, or somewhere between these two cultural poles, and this variable is quantified in the value-pair masculinity-maleness. In the beginning of the simulation each boy is perceived as neither "masculine" nor "just male" (x = 50, y = 50). Throughout the simulation, interactions will increase his masculinity and decrease his maleness, or vice versa. By the end of the simulation, each lad has x and y values that represent his success at achieving the lad cultural ideals for masculinity (e.g., x = 90, y = 10). It is important to recognize that the cultural variable being quantified is each boy's "lad-ness," as this was a key characteristic drawn out by Willis in the ethnography. No further attempt was made to provide qualitative descriptions of a simulated lad's masculinity.

In the model there are several entities with which a lad can interact: a teacher at school, a conformist boy, another lad, and a woman. Each of these entities was included in the model because Willis identified them as important factors in the emergence of lad culture. For each of these entities, there is a percent chance of interaction, and a percent chance that that interaction will reinforce lad culture. The chance that a lad will interact with one of these entities is a simple montecarlo function. Likewise, the chance that each interaction will reinforce lad culture is also a montecarlo function. These percentages can be set to different values using a simple user interface (Appendix B) so that the effects of different social scenarios can be tested.

The second model, Industrial Business (see Appendix C), is loosely based on *Learning to Labor* and is a generalized representation of industrial capitalist production in an idealized business that produces a product for the marketplace; it is not based on details of any specific business or industry. The parts of this model include the workforce, the company's financials, the marketplace, the lads' cultural identity, profit maximization, responsiveness to market conditions, and the economic concept of supply and demand for both the cost of labor and the cost of products. This model represents the effect of market-driven business decisions on wages and how the presence of a lad culture affects the structural characteristics of industrial capitalism. As Giddens suggested, this model uses "methodological bracketing" and treats the structural properties of industrial capitalism as chronically reproduced features. But, as Giddens cautioned, it is important to:

> …take care with this, of course, for to treat structural properties as methodologically "given" is not to hold that they are not produced and reproduced through human agency. It is to concentrate analysis upon the contextually situated activities of definite groups of actors following tenets as important in the analysis of strategic conduct: the need to avoid impoverished descriptions of agents' knowledge ability; a sophisticated account of motivation; and an interpretation of the dialectic of control. Consider the research described by Paul Willis in his book *Learning to Labor*. (Giddens 1984:288)

The two models were logically, but not dynamically, interrelated to allow manipulation of the variable that linked them. The purpose of this interrelation was to analyze the strategic conduct of the lads and to understand how their anti-structural

cultural decisions while in school affect the model of industrial capitalism and vice-versa: how changes in economic conditions affect the development of lad culture. The former relationship was tested by passing the values of the variable Lad Identity from Lad Culture to Industrial Business. The latter was tested by setting the value of the variable Get Job to higher or lower value. This represented the percent chance that a lad would have the opportunity to work during an iteration of the simulation, and approximated how economic conditions may have affected the lads.

In addition to conducting controlled experiments, I recorded observations of the process of creating the simulation models, the strengths and limitations of the modeling language, and any assumptions made while creating the models. It is common in ethnographic research to include these kinds of data in one's analysis, but perhaps less-so in simulation modeling research. However, I argue, as others have (Small 1997:1; Gilbert and Troitzsch 1999:4), that one of the important uses of simulation modeling in social science research is *explanation* of the social processes being modeled. Certainly information from the modeler regarding processes or sub-processes that are difficult to model is important to understanding both the processes in question or possible methodological limitations.

Three controlled experiments were conducted to test the limits of structuration theory: (1) how the lads' choosing to work while in school affects the emergence of lad culture, (2) how economic conditions affect the emergence of lad culture, and (3) conditions that facilitate the lads' penetration of industrial capitalism. Through these simulation experiments I assess the assumptions, boundaries, and implications of structuration theory.

Test 1 – Choosing to Work

How does working affect the development of lad culture and the overall functioning of industrial capitalism? This test explored the sensitivity of two structural components (lad culture and industrial capitalism) to choices the lads make while they are in school. This test was designed to address Ortner's first question: how does individual action affect social structure?

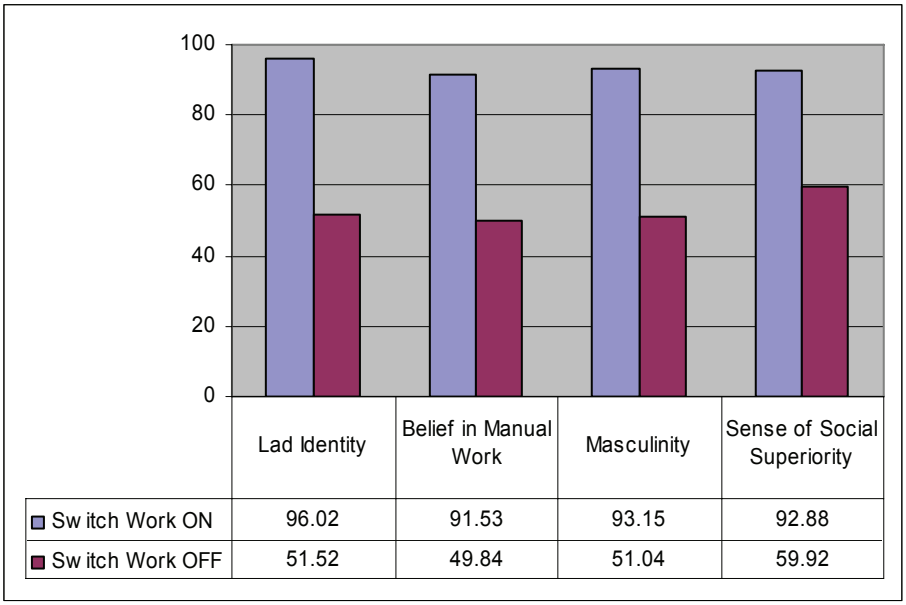
In the ethnography, each lad chooses whether or not he will take a job if one becomes available while he is in school. The ethnographic evidence suggests that lads will almost always take a job if one becomes available, and that they frequently work ten hours or more per week (Willis 1981:39). Working is a key feature of lad culture that distinguishes them from their classmates. Ethnographic evidence in *Learning to Labor* suggests that working is not a ubiquitous characteristic of all young boys—just the lads, and Willis suggested that working is an important contributor to the development of lad culture. Furthermore, the act of working is a specific occurrence where the lads directly interact with the economy. This presents the opportunity to use the act of working to explore the relationship between the lads' decisions to work or not, the development of lad culture, and the overall functioning of capitalism.

I modeled the lads' choice to work, or not, as a "switch," ran the simulation model under both settings, and observed the effect on the lads' cultural values (Belief in Manual

Work, Lad Identity, Masculinity, and Sense of Social Superiority). I took the two average values for Lad Identity with Switch Work on and off, and ran a simulation in Model 2 – Capitalism under both of these settings. I then observed the effect these settings have on the different employment states, the Price of Labor and Capitalist Profits. I then examined these data in two ways: I calculated the average value during the simulation (e.g., the average price of labor), and examined the values on a time-series plot (e.g., standard deviation and patterns through time).

Test 1 – Results

The results of this test indicated that lad culture is very sensitive to choices that the lads make about working: lad culture only grows significantly when they work (Figure 2). But why is this so? Examination of the relationships in the section labeled Spending Money (see Appendix A) show that money can be earned at one point in time, stored, and used later.



	Lad Identity	Belief in Manual Work	Masculinity	Sense of Social Superiority
Switch Work ON	96.02	91.53	93.15	92.88
Switch Work OFF	51.52	49.84	51.04	59.92

Figure 2: Results of experiment designed to test how the lads' choosing to work while in school affects the development of lad culture.

Spending money is important because the lads have more control over its use than the other interactions in the model that occur randomly. In other words, when a lad has a day when nothing happens to reinforce lad culture, he can always spend money—and this will always reinforce the growth of his culture. It is important to note that this behavior was not intentionally pre-programmed into the model. Although Willis discussed the importance of working in the lives of the lads and in developing lad culture, he never suggested that the development of lad culture hinges so significantly on their ability to earn and store money; Willis actually placed more responsibility on gender relations

between men and women. This observation is the result of running the simulation, not from ethnographic field methods. The simulation models suggest a positive relationship between spending money and the development of lad culture. This relationship would need to be validated through further field research that would explore with more precision the relative significance of different types of decisions on the development of lad culture.

In the model, industrial capitalism is somewhat sensitive to lads' actions, but the sensitivity appears in parts of the system that affect the lads' lives—principally in the areas of unemployment and wages. Capitalist profits are affected slightly, but not significantly. The simulation results suggest that the industrial capitalist system is quite resistant to the effects of the lads choosing to work because the capitalist has the option of adjusting the size of the workforce based on market demand, and to ensure profits. The sensitivity it does show is in the areas of unemployment, wages, and capitalist profits. The relative effect of working on capitalist profits is very small and is unlikely to dramatically upset the system. The effects on wages and unemployment are more significant, although not dramatic, but probably represent a much larger disruption to the lives of the workers. Of the two social structures represented in the models, lad culture appears to be more sensitive to the lads' actions than to the industrial capitalist structure.

Test 2 – Sensitivity of Lad Culture to Economic Conditions

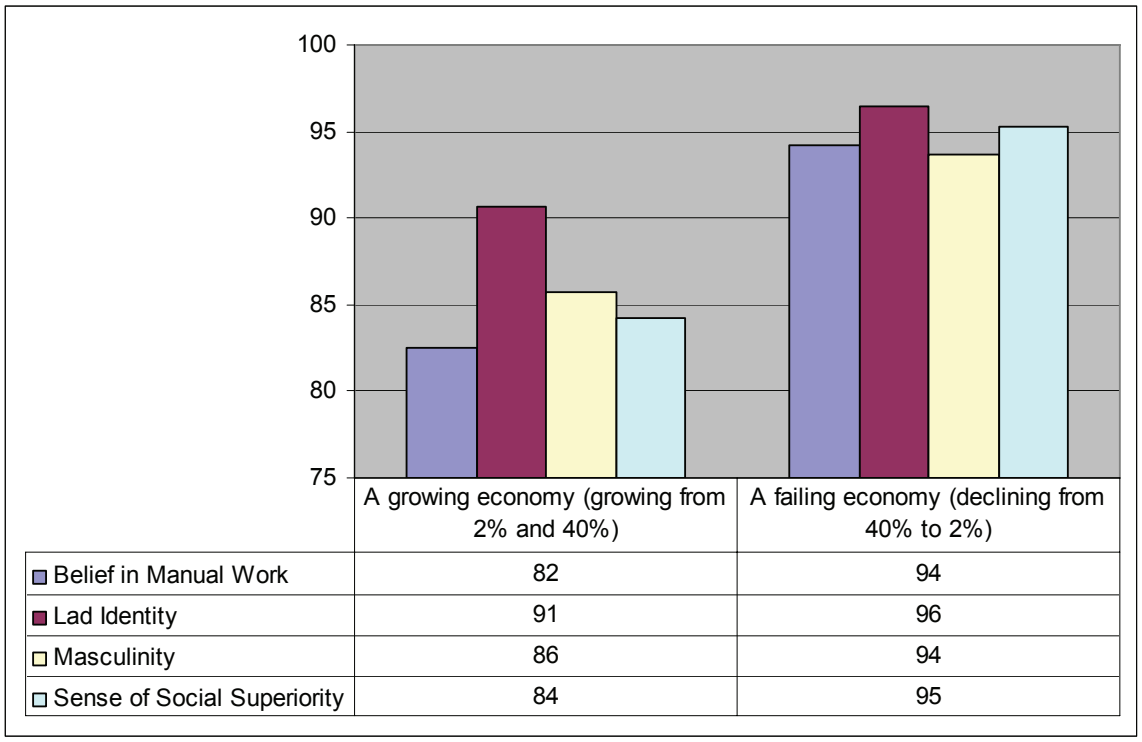
To test how structural characteristics shape individual action, economic conditions were changed so that the lads have different probabilities of getting the opportunity to work. Then each lad's Masculinity, Lad Identity, Belief in Manual Work, and Sense of Social Superiority were recorded. This test yielded results indicating the sensitivity of lad culture to different economic conditions. The independent variable is a time-series function that determines the chance that a lad will have the option to take a job during the simulation; it contains a value between 0 and 100 that represents the probability that work will be available on any given day. Two conditions were tested: a growing economy (growing from 2% to 40%), and a failing economy (declining from 40% to 2%). With these data, I looked for patterns that indicated how sensitive lad culture was to external structural conditions. I sought patterns that indicated how the growth of lad culture was tied to these conditions and what long-term effects, if any, on working class culture existed.

Test 2 – Results

Figure 3 displays results from this test and suggests that a failing economy seems to be more conducive to the growth and development of lad culture than a growing economy. An examination of the time-series plots in Figure 4 helps to explain why this happens. The simulated lad culture seems to be more sensitive to growth in the beginning of the simulation than in the end. In the beginning of the simulation, a growing economy is weak, and this is the time when the lads are trying to build lad culture; one might think of this period of time as a window of opportunity for building lad culture. The failing

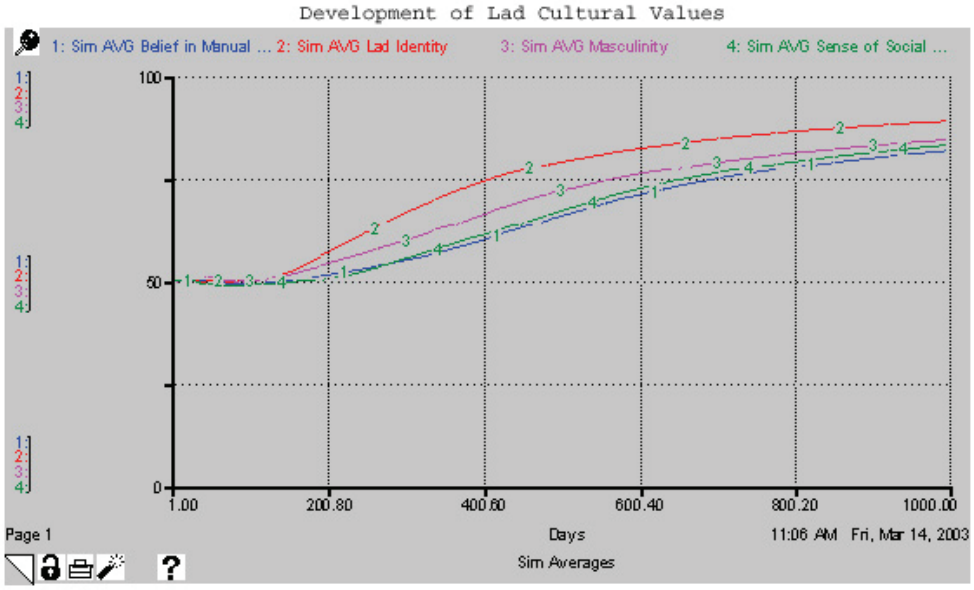
economy is strong during this same time period and provides the jobs that the lads need to grow their culture. When the economy begins to fail in the second half of the simulation, lad culture is already established.

It is normal during the first iterations of a simulation to observe a period of rapid change during which the system reaches an equilibrium state, and in many simulations it is standard practice to run a "burn-in" period before collecting simulated data. In this case, however, the rate of change during this initial "burn-in" period appears to be quicker under a failing economy. This observation is not, of course, a prediction of what will happen to lad culture; instead, it is intended to draw out the relationship between lad culture and structural/economic conditions.

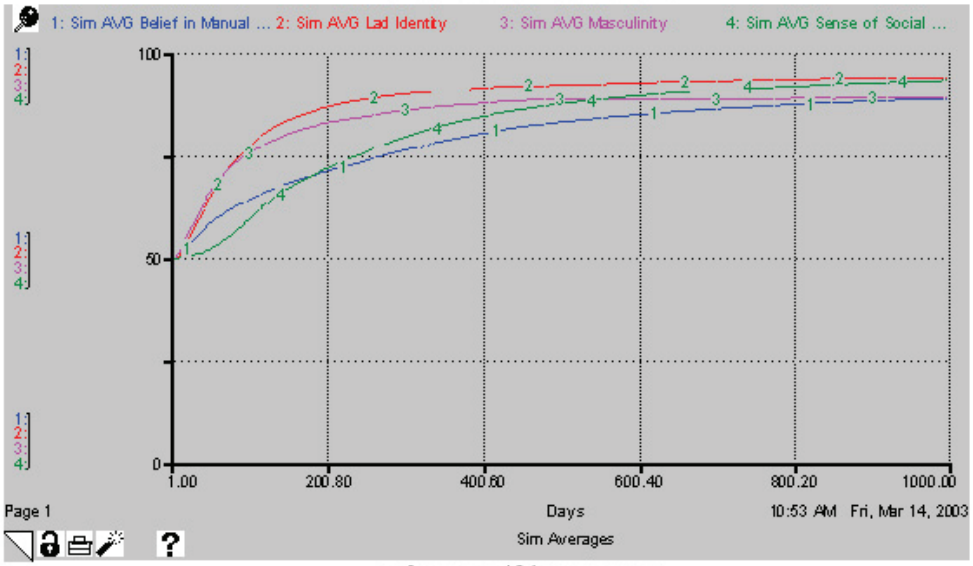


	A growing economy (growing from 2% and 40%)	A failing economy (declining from 40% to 2%)
Belief in Manual Work	82	94
Lad Identity	91	96
Masculinity	86	94
Sense of Social Superiority	84	95

Figure 3: Sensitivity of lad cultural values to growing and a failing economy.



Under a Growing Economy



Under a Failing Economy

Figure 4: Time-series plots of the growth of lad culture under strong and failing economies.

Test 3 – Penetrating Industrial Capitalism

In the model Industrial Business, the independent variable Lad Identity is a representation between 0 and 100 of the strength of what Willis describes as "lad culture." In this test Lad Identity is configured with five values: 0, 25, 50, 75, and 100. In increasing order, each of these values represents a more strongly developed lad culture. Demand for higher wages decreases as lad culture becomes stronger. If wages are not at the level demanded by the lads, then there is a higher probability that they will remove themselves from the

labor pool. This is an assumption; Willis did not discuss the exact mechanism by which workers may decide to remove themselves from the labor pool, so I had to make an educated guess. In the model, this is accomplished by using a graphical function that returns a multiplier between 0.5 and 1.5 that modifies how the lad makes this decision.

This decision is based on a supply and demand function that removes a percentage of workers from the active workforce depending on the level of wages. The logic behind this assumption is that a worker with a strong lad culture will be less willing to remove himself from the labor pool; his penetration of the industrial capitalist system is overwhelmed by his limitations, as Willis described. Workers who do not identify themselves as lads will be more likely to penetrate the system and remove themselves.

This test involved running five sets of simulations, in which one set of runs represented one of the five levels of lad culture. Each set consisted of ten runs and the averages of these runs are presented in the results section. I analyzed these data to see what trends might emerge and if there are circumstances under which working class culture does not reproduce the industrial capitalist system. Failure to reproduce the industrial capitalist system is represented by a large proportion of workers taking themselves out of the labor pool. The social simulation models might help explain conditions when the lads may be more likely, and capable of a more complete, penetration of industrial capitalism, as well as answering when individual action does or does not reproduce social structure.

Test 3 – Results

The results of Test 3 are presented in Figure 5. The dependent variable has two data values: an average and a standard deviation. The average was used to assess the long-term effect of Lad Identity on their decision to remove themselves from the labor pool. This measure may miss short-term volatility, however. Standard deviation, as a measure of variability, permits observation of the effect that individual action has on the overall volatility of the system. One might question how a statistical measure of volatility helps explain the social relationships here in question. I suggest that the simulation results may indicate a set of conditions that lead to one or more periods of time in which the standard deviation of certain variables are higher than at other times and conditions. Normal standard deviations (during one simulation run or between several simulation runs) are taken to represent the lads' normal day-to-day state of affairs, and acceptable levels of psychological stress (as suggested by Giddens). Standard deviations higher than normal suggest a qualitatively different state of affairs in which certain conditions change and fluctuate rapidly during relatively short periods of time, which the long-term averages do not capture. These fluctuations might indicate higher levels of psychological stress and discomfort that may, in a qualitative sense, yield social conditions that are unexplored in *Learning to Labor*

Figure 5 shows that the standard deviation changes in response to changes in Lad Identity and exhibits an S-shaped curve. Because the variables' values are less important than their relationships, I multiplied the standard deviation by a factor of ten so that the pattern would become clearer and they could be compared to the averages for the same

variable. When Lad Identity grows from 0 to 75 the average number of workers who remove themselves from the labor pool remains level. The standard deviations, however, show that there is initially some volatility in the number of workers striking day-to-day, but this drops somewhat as Lad Identity approaches 25. From 25 to 50, the volatility begins to build, and then exceeds its original value as Lad Identity reaches 75. Finally, when Lad Identity approaches 100, both the average number of workers and the standard deviation drop; the standard deviation drops almost exactly to its starting point, and the average drops to it lowest value of all five runs.

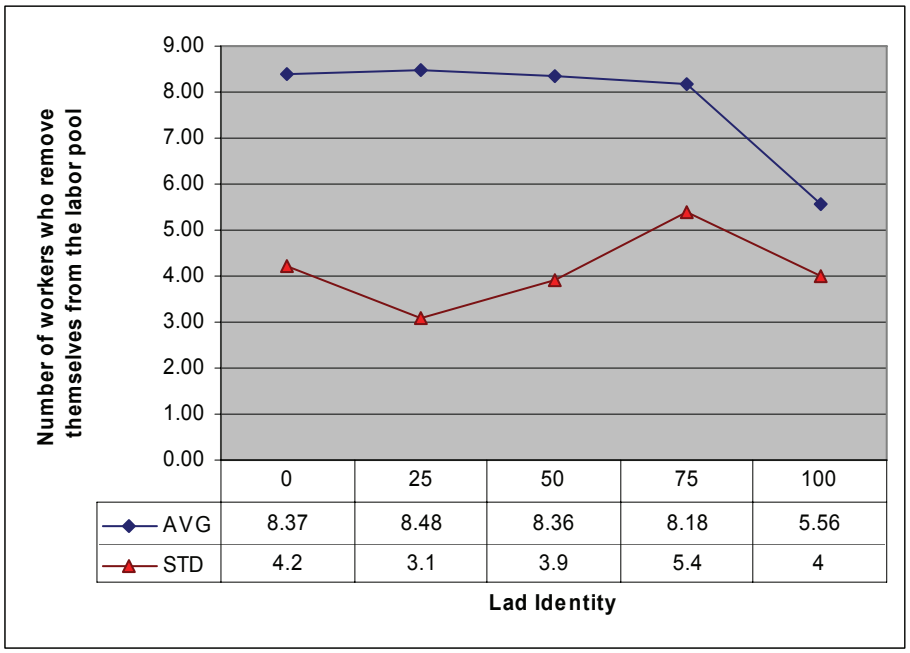


Figure 5: Average and standard deviation of the number of lads who remove themselves from the labor pool

The average number of workers removing themselves from the labor pool over the course of the entire simulation varies little unless Lad Identity is very strong. How can this be interpreted? One possibility is that all workers, except the most ardent lads, maintain some penetration of industrial capitalism and reserve the right to remove themselves from the labor pool. The workers with the strongest Lad Identity still occasionally act on their penetrations, but in comparison to the others, they act much less frequently. However, penetration is not directly represented in this simulation model; instead, this model is based on structural and economic relationships. A pattern exists that indicates that the number of workers who remove themselves from the labor pool varies little unless Lad Identity is strong. This pattern suggests the need for further ethnographic exploration of the relationship between lad identity and striking; however, one conclusion can be made: the sharp drop-off in the number of workers who remove themselves from the labor pool may indicate that only a strong lad identity will successfully reduce the number of workers who remove themselves from the labor pool. A moderate lad identity appears to be insufficient. Although Willis did not discuss the factors by which a lad

might choose to remove himself from the labor pool, he did suggest that the bosses prefer workers with a strong lad identity to those with more conformist tendencies: "In manual and semi-skilled jobs, then, those in authority often actively prefer "the lads" type to the "conformist" type" (Willis 1981:110). The reason Willis gave for this is that the lads are more accepting of tough manual work, have lower expectations for personal fulfillment through their work, and have a social network with other lads that they use to compensate for this menial and difficult work. One might be tempted to consider these as traits of a conformist, but this is not the meaning Willis used. Conformists expect job advancement and personal satisfaction and lack the social gratification that lads get from being at work. These results suggest that there may be other reasons why the bosses like workers with strong lad identity—that they are less likely to remove themselves from the labor pool, thus ensuring a more productive workforce.

The standard deviation of the number of workers who will remove themselves from the labor pool is at its highest when Lad Identity is at 75. This indicates the possibility of an interesting social situation: as I have suggested, the standard deviation can be used as an indicator of social volatility. When Lad Identity is at 75 a significant number of workers are still willing to act on their penetration of industrial capitalism. But the increased volatility suggests that there will be more workers who choose to remove themselves from the labor pool *at the same time* than in the other four scenarios. The concept of timing is critical; it indicates that there may be a higher likelihood that effective penetration of industrial capitalism will occur when there is a moderately strong lad identity.

Discussion and Conclusions

What can be interpreted from the results of these simulation experiments? The results of Test 1 demonstrated that individual action does affect social structure; there was a strong positive correlation between the lads' choice to work and the growth of lad culture. The results of Test 2 suggest that economic conditions affect the development of the lads' cultural traits. Furthermore, different economic conditions through time—a failing or improving economy—affect how strong the lads' cultural traits grow. The models hint at how different trajectories of change through time may result in different effects at the level of the agent. One question that the models do not answer is precisely how the lads relate to industrial capitalism in history. Agents and structure both affect each other, but there is no way to understand from the models or from *Learning to Labor* how the emergence of lad culture correlates with the emergence of industrial capitalism; this was not Willis' goal in conducting his research nor mine in building the models. However, the fact that these questions remain at this point suggest that some of the underlying assumptions behind both the ethnographic and the simulation modeling projects have caused us to miss some important dynamics of these relationships.

During the process of researching, building, and testing the models I recorded thoughts and reflections as an ethnographer cum modeler that help provide insight into the utility of modeling for ethnographic research and testing social theory. A general theme that emerged was the need for precise information about the relationships between

specific parts of the lads' culture and how these relationships reinforce both lad culture and industrial capitalism. Some of this information was not included in *Learning to Labor* and thus I had to formalize several assumptions in the simulation models that were not based directly on ethnographic evidence. Based on these insights, I suggest that both Willis and Giddens share an analytical limitation: they insufficiently separate individual action from social structure and do not analytically specify the relationship between individual action and social structure.

These observations suggest that Foucault's version of power may provide a more accurate (if somewhat more difficult to implement, methodologically) framework than structuration theory. For Foucault, everything must be understood within its historical and cultural context; generalized structures are not acceptable because, "…if one tries to erect a theory of power one will always be obliged to view it as emerging at a given place and time and hence to deduce it, to reconstruct its genesis…" (Foucault 1980:199). This is exactly what occurred in this simulation modeling exercise, and I suggest that Willis, too, falls prey to this problem. By relying on theoretical models rather than historical context, both Willis and I have ended up with theories that are dislocated in time, space, and history. But if I had taken Foucault's advice and conceptualized power as, "…an open, more or less coordinated…cluster of relations, then the only problem is to provide oneself with a grid of analysis that makes possible an analytic of relations of power."

What would such a grid of analysis look like for the lads? Certainly Giddens' "methodological bracketing" would have to be discarded because it externalizes social structures from the individual. Despite Giddens' cautions to avoid "impoverished descriptions of agents' knowledge ability" (Giddens 1984:288) and that "the nature of constraint is historically variable" (Giddens 1984:179), this approach has not, in the case of this research, substantially moved us closer to understanding any of the fundamental dynamics of agent-structure relationships. It seems that the two models would have to be collapsed into one that played out cultural and structural forces that lead to the emergence of lad culture. This process of "playing out" must happen *within* each agent. Social structures that existed prior to the emergence of lad culture would need to be incorporated in such a way that the emergence of lad culture was one of the possible simulated outcomes. Examples of the kind of research that may be amenable to this type of modeling are *Europe and the People Without History* (Wolf 1982) and *Making of the English Working Class* (Thompson 1966). However, where these books are structural/historical accounts, Foucault reminds us that these macro-level processes play out as subjective *ethics* within the agent. Thus, any modeling effort would have to incorporate social objects that both constrain and enable individual action and that are minimally malleable to individual ethical interpretation.

Using simulation to explore the limits of Willis' ethnography revealed conditions under which the lads were more likely to penetrate industrial capitalism. A window of opportunity opened under moderately strong lad culture when the lads more effectively penetrated industrial capitalism, and were better poised to act on this and escape its trap. This observation would certainly need to be explored ethnographically.

Margaret Archer observed the following about structuration theory:

> My criticism is that this scheme [structuration theory] merely boils down to a restatement of mutual constitution: it is fundamentally unpropositional about the conditions patterning different relationships. Again this is because no genuine relative autonomy is granted to either level so what results is merely a re-assertion of their interpenetration, not an examination of their interplay. (Archer 1996:83–84)

Archer criticizes structuration theory for not giving "genuine autonomy" to either individuals or structure. Although I was able to analytically separate the lads from industrial capitalism by "methodologically bracketing" them into separate simulation models, this approach did not help me to better understand the relationship between the two. Primarily, this was because the ethnography did not specify the details of this relationship, and in lieu of these ethnographic details I used Giddens' account of personal motivation—that individual action derives from the desire to reduce psychological anxiety. Willis observed that money was highly significant to the lad, so I used wages to determine whether a lad would work, or penetrate, industrial capitalism. Unfortunately, this is a facile assumption. Do beliefs and religion, or sense of duty and responsibility have no impact on how individuals, including the lads, choose to act? There must be something other than the need for money and the lack of other options that compel the lads to take dirty and dangerous industrial jobs (a characterization that is another example of Willis' assumptions).

While *Learning to Labor* specifies why the lads *let themselves* take working-class jobs, it is limited by the lack of ethnographic detail that precisely specifies why the lads *choose* to take industrial jobs. An explanation of this choice is critical within the framework of practice theory outlined by Ortner. Foucault might agree; in his view, the lads would internalize structures of control embodied by industrial capitalism and subjectively experience and act upon them. Giddens' advocation of "methodological bracketing" did not help the models elaborate on this relationship, although Giddens, unlike Willis, acknowledges the contextualizing role of history in both enabling and constraining agents' actions. Given the lack of ethnographic data, I ultimately had to rely on the individual's desire to relieve psychological anxiety to define the relationship between agent and structure. By relying on psychological motivations, however, the models appeared and acted deterministic and functional, an ironic situation because both Giddens' and Willis' theoretical goal was to avoid determinism. Yet structuration did not provide a workable theoretical and methodological framework that avoided determinism, and Willis failed to provide ethnographic details that empowered his agents.

Since my simulation models were based almost exclusively on the data in *Learning to Labor*, the models tended to reproduce the conclusions that lad culture is important to, and reinforces, industrial capitalism, while leaving the lads few other options. I would have liked to avoid this assumption by creating an agent model to represent lad culture; however, *Learning to Labor* did not provide the interactional data needed to create such a model. Also, I would have liked to see ethnographic data of boys who penetrated the system or who did not choose working class jobs. In lieu of these

data, I had to experiment with the relative effects of different social variables on social structure.

After completing the modeling process and running the social experiments, I can make some general comments. The ethnography does an excellent job of describing why working class boys let themselves take working class jobs. It does not succeed, in my opinion, at depicting the lads as empowered agents who made conscious, informed decisions independent of the functionalist needs of capitalism. If this was Willis' goal when he began his research, he began with contradictory goals. Although he provided a rich explanation of why these boys let themselves take working class jobs, he ended the ethnography coming back to his own starting point: they let themselves take working class jobs because of working class culture, without referring to the historical context of British working class culture. By omitting the role of the historical development of working class culture and by giving more power to cultural logic than to social structure, the picture Willis paints of lad culture is an effective synchronic description, but a less than satisfying diachronic explanation of the dynamics of lad culture. As such, *Learning to Labor* cannot be considered an adequate exemplar of the duality of structure that occupies a central place in structuration theory, or more generally, for practice theory.

Ultimately, the simulation models themselves shed little light on the fundamental relationship between agency and structure. But the analysis of the simulation results supports Archer's critique of Giddens' structuration theory and Foucault's admonition to avoid "theories of power." Finally, the simulation modeling process and analysis of the simulation results in this research have provided added insight into some of the patterns, trends, limitations, and opportunities that occur in the interaction between the lads and industrial capitalism in *Learning to Labor*.

References Cited

Archer M. Morphogenesis vs. Structuration. On Combining Structure and Action. The British Journal of Sociology. 1982 33:455–483.

-- Realist Social Theory: The Morphogenetic Approach. Cambridge: Cambridge University Press; 1995.

-- Culture and Agency: The Place of Culture in Social Theory. Cambridge: Cambridge University Press; 1996.

-- Being Human: The Problem of Agency. Cambridge: Cambridge University Press; 2000.

Barfield TJ. The Dictionary of Anthropology. Cambridge, Mass: Blackwell Publishers; 2000.

Beekman CS. Agency, Collectivities, and Emergence: Social Theory and Agent Based Simulations. In: Beekman CS, Baden W, eds. Nonlinear Models for Archaeology and Anthropology: Continuing the Revolution. Aldershot, U.K.: Ashgate Press; 2005: 51-78.

Benton T. Objective Interests and the Sociology of Power. Sociology 1981 15: 161-184.

Berger PL, Luckman T. The social construction of reality. New York: Doubleday-Anchor; 1967.

Bourdieu P. Outline of a Theory of Practice. Cambridge: Cambridge University Press. 1976.

Downey, SS. Experimenting with "Lad Culture": A Simulation Based on Willis' Learning to Labor. Mathematical Anthropology and Cultural Theory. 2005:1(4). Available at http://www.mathematicalanthropology.org/pdf/Downey1005.pdf. Accessed on February 25, 2006.

Foucault M. Power/Knowledge: Selected Interviews & Other Writings 1972-1977. Colin Gordon, ed. New York: Pantheon; 1980.

-- The Care of the Self. New York: Random House; 1986

Kiel D, Elliott E. Chaos Theory in the Social Sciences. Ann Arbor: University of Michigan Press; 1996.

Giddens A. Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis. Berkeley: University of California Press; 1979.

-- The Constitution of Society: Outline of a Theory of Structuration. Berkeley: University of California Press; 1984.

-- Central Problems in Social Theory: Action, Structure and Contradiction in Social Analysis. London: Macmillan Press; 1986.

Gilbert N, Conte R. Artificial Societies: The Computer Simulation of Social Life. London: UCL Press; 1995.

Gilbert N, Troitzsch KG. Simulation for the Social Scientist. Buckingham: Open University Press; 1999.

Lansing, S. The Cognitive Machinery of Power: Reflections of Valeri's The Forest of Taboos. American Ethnologist. 2003 30(3):372-380.

Marcus, GE. Contemporary Problems of Ethnography in the Modern World System. In: Clifford JC, Marcus, GE, eds. Writing Culture. Berkeley : University of California Press; 1986:165-193.

-- Anthropology as Cultural Critique. Chicago: University of Chicago Press; 1999.

Ortner SB. Theory in Anthropology Since the Sixties. In: Dirks NB, Eley G, Ortner SB, eds. Culture/Power/History: A Reader in Contemporary Social Theory. Princeton: Princeton University Press; 1993: 372-411.

Miller D, Tilley C. Ideology, Power and Prehistory: An Introduction. In: Miller D, Tilley C, eds. Ideology, Power and Prehistory. Cambridge University Press, Cambridge; 1984:1-15.

Richmond B. An Introduction to Systems Thinking: Stella Software. Hanover, New Hampshire: High Performance Systems; 2001.

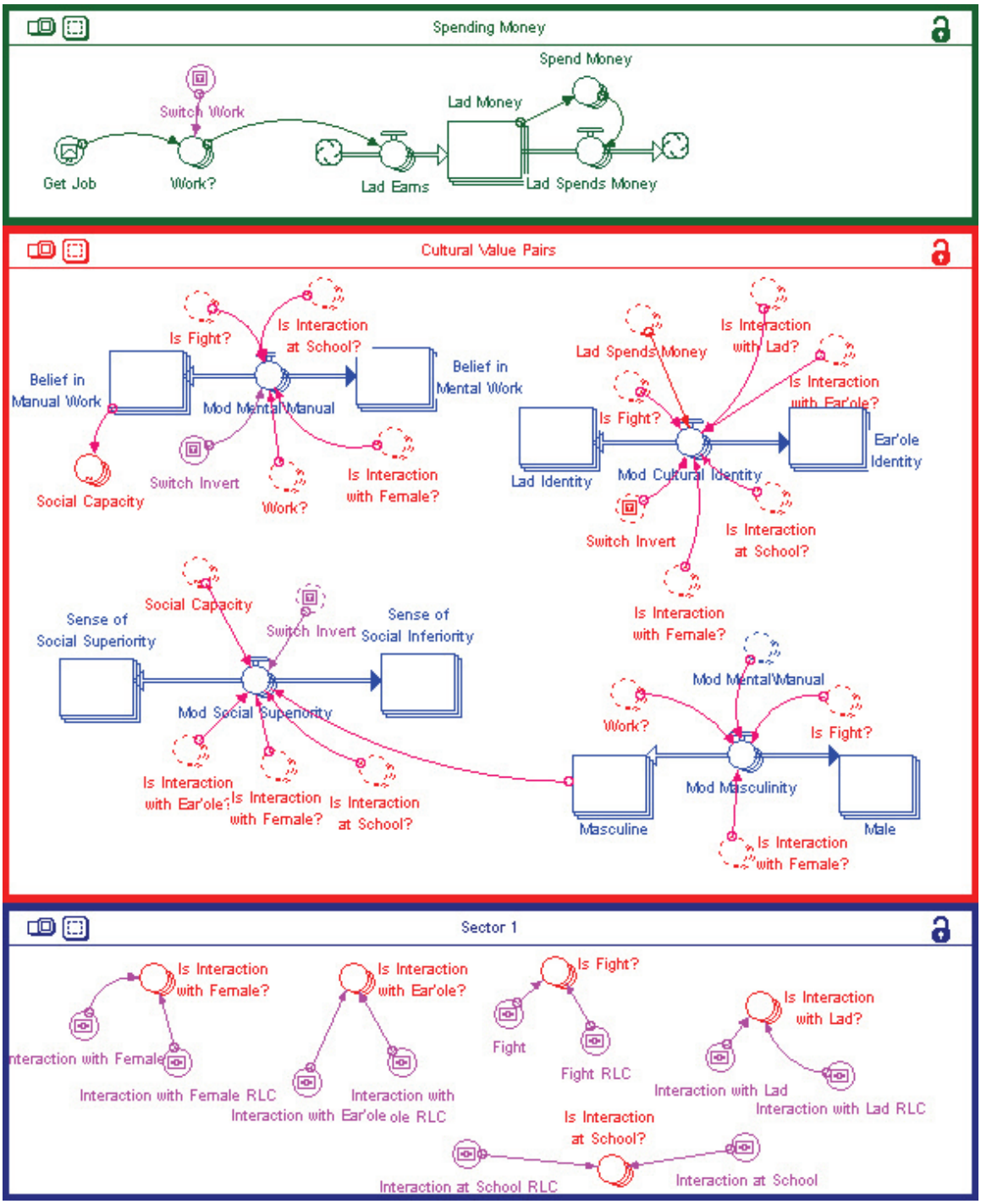
Small C. A Computer Simulation Approach to Ethnographic Analysis. Cultural Anthropology Methods; 1997:9(3):1–8.

Thompson EP. The Making of the English Working Class. USA: Vintage Books; 1966.

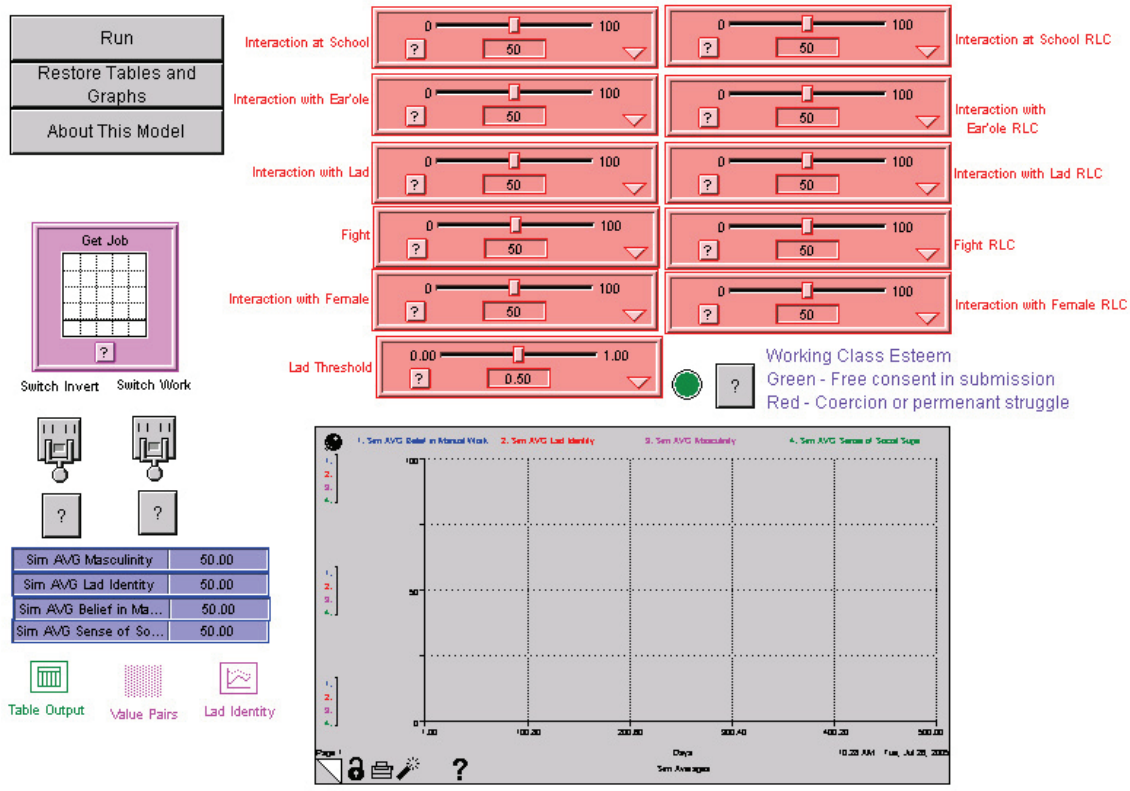
Willis P. Learning to Labor: How Working-class Kids Get Working-class Jobs. New York: Colombia University Press; 1981.

Wolf E. Europe and the People Without History. Berkeley: University of California Press; 1982

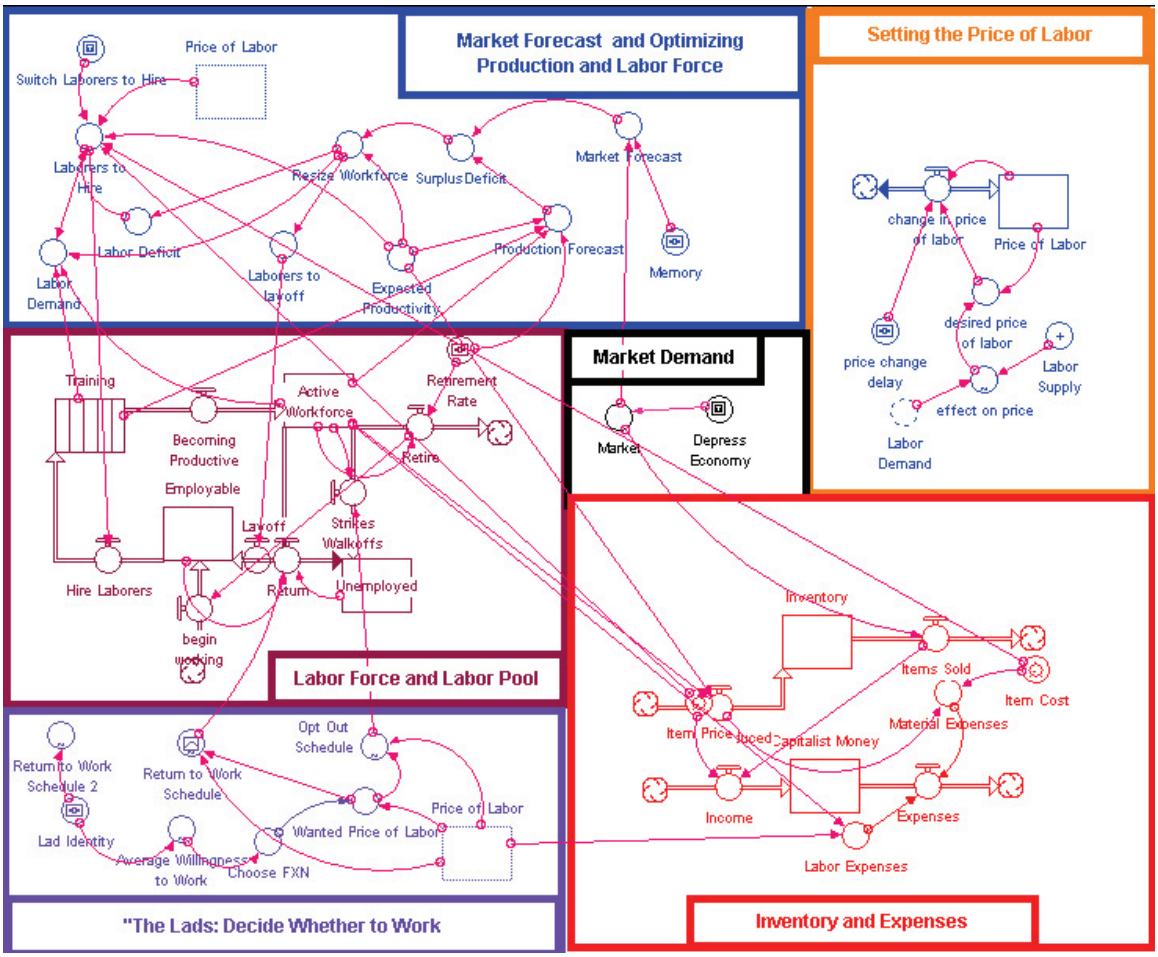
Appendix A – Schematic Diagram of Lad Culture Model



Appendix B – User Interface to Lad Culture Model



Appendix C – Schematic Diagram of Industrial Business Model



Appendix D

This appendix provides access to the source code, and software needed for both models discussed in this paper.

The models were developed and run using Windows 2000 operating system, and Stella Research 7.0.2 by isee systems. For the ongoing integrity of this archive, the source code and application software is being provided below. However, it is recommended that an updated simulation "player" application be downloaded from isee systems' website: http://www.iseesystems.com/.

For Source Code: return to the Cover Page and click source.htm
This will allow you to download:

Binary file: IndustrialBusinessModel.stm
Zip Archive: IndustrialBusinessModel.zip
SIT Archive: IndustrialBusinessModel.sit

Binary file: LadCultureModel.stm
Zip Archive: LadCultureModel.zip
SIT Archive: LadCultureModel.sit

For Stella Player: return to the Cover Page and click stella.htm
This will allow you to download:

PC Binary: iseePlayer8_1.exe
PC Zip Archive: iseePlayer8_1.zip

Macintosh: Binary: iseePlayer8_1.hqx
Macintosh SIT Archive: iseePlayer8_1.sit

The Stella player application is required to run the source code file, above. If you already own a licensed copy of Stella, you do not need to download a Player.

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