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A SIMULATION BASED ON WILLIS’ *LEARNING TO LABOR***

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**EXPERIMENTING WITH “LAD CULTURE”:  
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**SEAN S. DOWNEY**

*Abstract: This paper presents a case-study demonstrating how traditional ethnographic fieldwork may benefit from analysis using computer simulation modeling tools. Paul Willis’ classic ethnography, “Learning to Labor” is represented using the system-modeling software Stella, and used experimentally to test several aspects of the worker-business relationship. I include a description of the models, the rationale for using systems modeling instead of agent-based modeling, and results from two sets of simulation experiments. I describe how the model represents ethnographic data, how it was used experimentally, and implications of the research as a critique of “Learning to Labor.” I close by suggesting that the semantic conception of theories (McKelvey 1999) can be an appropriate model of scientific investigation to link social theory, ethnographic fieldwork, and simulation modeling.*

**INTRODUCTION**

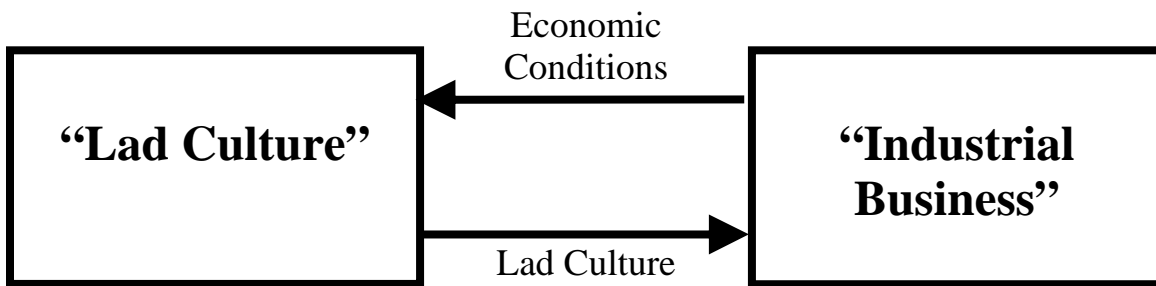
Several authors have argued the benefits of using simulation modeling to augment ethnographic research (Small 1997; Gilbert and Troitzsch 1999). This paper presents a case study, using Paul Willis’ ethnography “Learning to Labor” (1977), to demonstrate how traditional ethnographic fieldwork may benefit from analysis using computer simulation modeling. I will suggest that simulation modeling can be used constructively to expose important questions that were not asked while in the field, and identify important relationships that might not be evident. The benefits gained from simulating ethnographic observations come from carefully designed simulation experiments and from observations made by the modeler during the process of building the model.

**BACKGROUND**

“Learning to Labor” (Willis 1977) describes the lives of a small group of boys who self-identify as “The Lads.” They live in working class Birmingham, England in the mid-1970s. The ethnography describes how their rebellious actions against their school have the unintended consequence of driving them toward industrial jobs, and thus unintentionally filling a necessary “functional” role in industrial capitalism. The purpose of “Learning to Labor” was simply to explore how working class kids “let themselves”

get working class jobs (Willis 1977:1). 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 interviews and participant observation to explore how the lads construct this identity. He finds that many day-to-day interactions with classmates, teachers, the police, girls, and parents reinforce working class values. These interactions manifest as gender-based class divisions and an ingrained appreciation for manual labor, as opposed to the mental labor valued by the school. Since its publication in 1977, “Learning to Labor” has been critiqued and contextualized within the fields of resistance studies, anthropology, and sociology (Davies 1994, Marcus 1998, Mill and Davies 2001).

I created two separate models and linked them by variables that could be set as independent during the simulation runs (Figure 1). Both models were programmed using Stella, a systems modeling software package (Richmond 2001). The first model, Lad Culture, is based exclusively on ethnographic details from “Learning to Labor.” The second model, Industrial Business, is a generalized representation of a typical business that relies on a manual labor force to produce a product for consumption through a market. While Industrial Business is not based directly on “Learning to Labor,” it represents well-known economic functions such as price-setting through a supply-and-demand function and market forecasting.



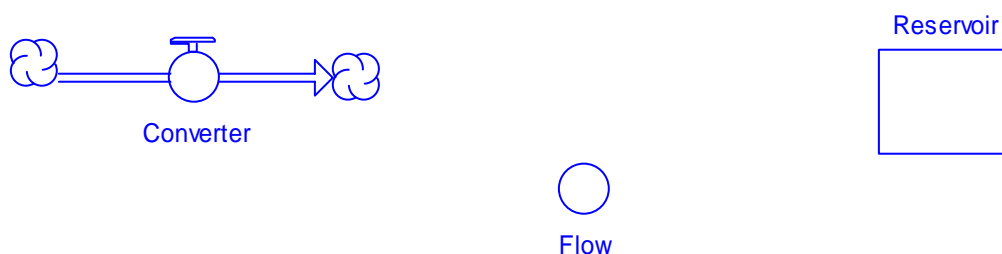
*Figure 1:* Schematic diagram representing the two models. The two arrows represent integer values indicating the strength of “economic conditions” and “lad culture” that could be passed between the two models to test different scenarios. The independent variables described in this paper include Lad Identity, Depress Economy, Get Job, and Interaction with Female RLC.

The two models were not integrated into a single model because time iterations for the lads were not the same as for the business. Lad Culture iterates through days, and the Industrial Business iterates through months. Events happened to the lads on a day-to-day basis, but it was not reasonable to suggest that the business would adjust its labor force daily, or that market conditions would change daily.

## STELLA VOCABULARY AND ICONOGRAPHY

It is important for the reader to have a basic familiarity with Stella and a few terms commonly used when discussing Stella models. Stella is a systems modeling tool which provides a means for creating a macro-level representation of a system using a series of difference equations to calculate the system's future state from its current state (Gilbert and Troitzsch 1999). Systems modeling is derived from systems theory (Forrester 1968), and while it has been used extensively in ecological modeling and engineering, it does not receive as much attention from social scientists primarily because is a deterministic approach.

Stella contains a graphical user interface through which the researcher assembles basic building blocks (Figure 2) into a schematic diagram. Converters can contain fixed values or functions; they are evaluated independently every iteration of the simulation, and their previous values do not affect these calculations. Reservoirs remember their values from the previous iteration and cannot contain functions. Flows contain constants or functions and move values into or out of reservoirs. The clouds on the end of a flow indicate that the flow is moving values out of, or into, thin air.

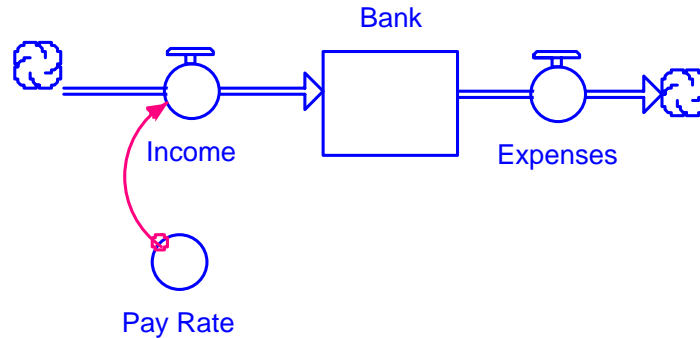


*Figure 2:* The basic building blocks of a Stella model.

Let us consider a very simple example. Figure 3 illustrates a model of a bank account and the movement of cash. The account itself is represented with a reservoir, income and expenses with flows, and a pay rate with a converter. The line connecting Pay Rate to Income illustrates how you pass information about the value of an object to another object in the model.

A cloud at the end of a flow can prompt interesting ethnographic questions. Technically, the clouds indicate an ecological challenge to existence of a closed system, which is usually important to ask regardless of whether the modeled system is social or physical. In this example the cloud might prompt the modeler to wonder where the bank gets the money to put interest into your account. It indicates that there may be other processes related to the payment of interest that may or may not be relevant to your model. The clouds overtly indicate assumptions behind the model that should, at a minimum, be acknowledged. For a social scientist, the clouds can indicate important

ethnographic questions that may need to be asked to more fully understand the system being modeled.



*Figure 3:* A simple Stella model of the flow of cash into and out of a bank account.

### “LAD CULTURE”

The model Lad Culture (Figure 4) represents the social interactions the lads experience and how each of these relationships contribute to the development of lad culture. This model includes interactions with teachers, conformist boys, girls and women, the police, and other lads. It has variables that represent several cultural values important to the lads including, masculinity, lad identity, belief in manual work, and a sense of social superiority. When the simulation runs, random functions determine if a lad has any these social interactions. If one occurs, relationships in the model adjust the boy’s cultural values in the direction described by Willis. The random functions can be modified so that different social conditions other than those described by Willis can be tested.

In the lower region, labeled Randomized Social Interactions, several random functions control which interactions a lad has each day of the simulation. In the central region, labeled Cultural Value Pairs, there are four sets of reservoirs that are a zero-sum pairs of variables that represent important cultural values on a scale from 0-100. So for example, according to Willis the most important value to the lads is their sense of belonging to their group. This is represented by a value-pair consisting of the reservoirs labeled Lad Identity, Ear-Ole Identity (read, “ear-hole”), and the flow Mod Cultural Identity. A boy that feels a strong sense of identity as a lad will have a high value in Lad Identity, and a low value in Ear-Ole Identity. The converters with the dashed lines point to the random function converters that determine what kinds of interactions the lad has during each day of the simulation. Continuing the example, a lad that was feeling distanced from his mates might win a tough fight and earn some respect. This event would increase the reservoir Lad Identity by the same amount that Ear-Ole identity is decreased.

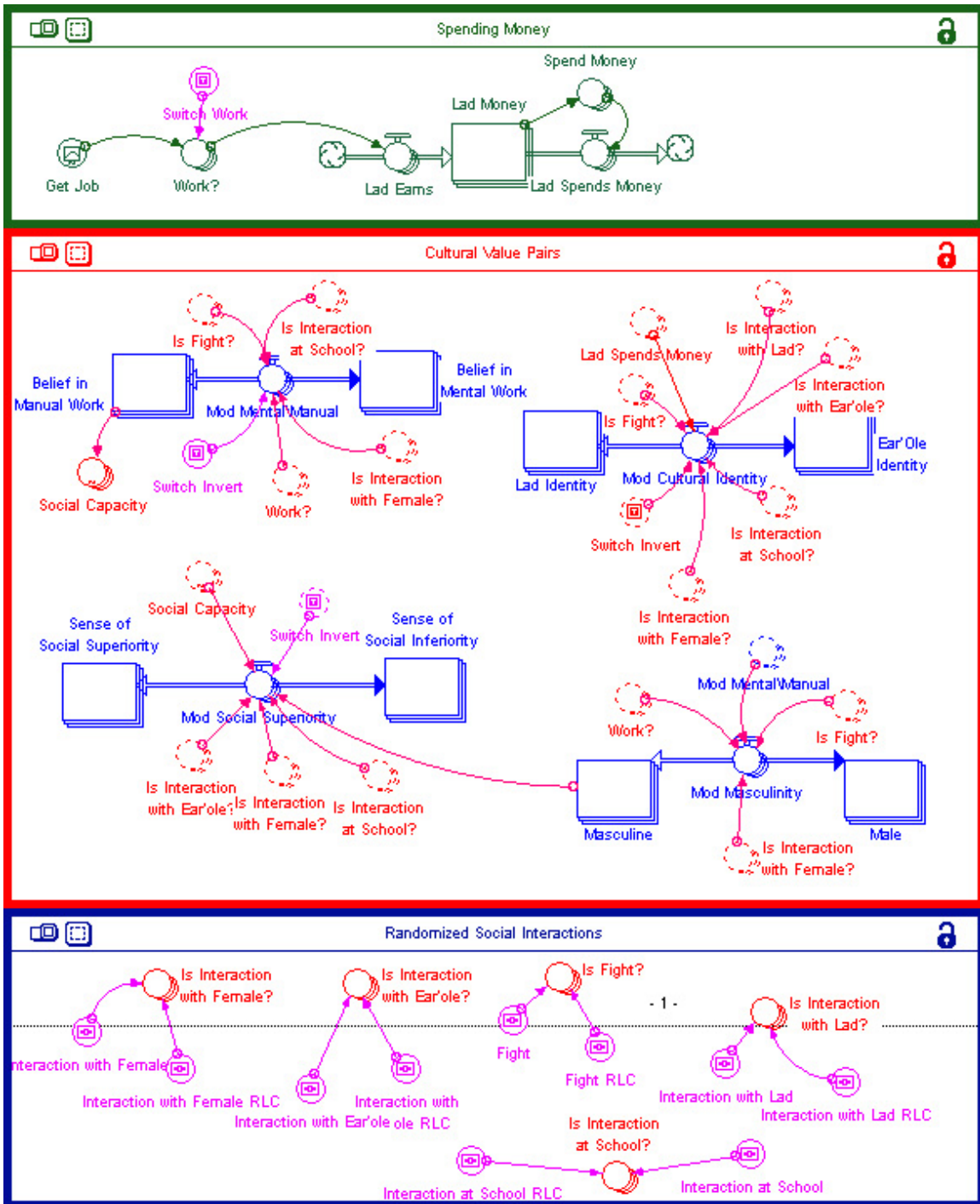


Figure 4: Schematic diagram of the model, "Lad Culture".

There are four sets of value-pairs in the model, although not all are being discussed here: Lad Identity versus Ear-Ole Identity, Belief in Mental Work versus Belief in Manual Work, Sense of Social Superiority versus sense of Social Inferiority, and Masculinity versus Maleness. The important thing to remember with this model is that all the entities and all the relationships are backed up by Willis' observations and, frequently, by specific quotations embedded in comments in the model.

The last section of this model, labeled Spending Money, represents the lads' working and spending habits. The converter Get Job represents the overall economic conditions throughout the simulation run in terms of the likelihood that a lad gets the chance to work that day. The converter Switch Work is a Boolean switch that can prevent the lad from working. If the switch is on and the lad gets offered a job, he earns some money, which is stored in the reservoir Lad Money. Spend Money is a function that determines a random percentage of his money to spend. As with the interaction functions in the bottom of Figure 4, spending money affects the lad's Cultural Value Pairs in specific ways that were identified in the ethnography.

### **“INDUSTRIAL BUSINESS”**

For the model of an industrial business I tried to include some of the key characteristics of a business that produces a product for sale to a market (Figure 5). In it there are functions that optimize profits by adjusting the size of the active labor force based on a forecast of market demand and inventory levels. As the optimization function changes the number of available workers currently employed and those unemployed, a supply-and-demand function changes the price of labor. The independent variable, Lad Culture, affects the workers' decisions to work or not.

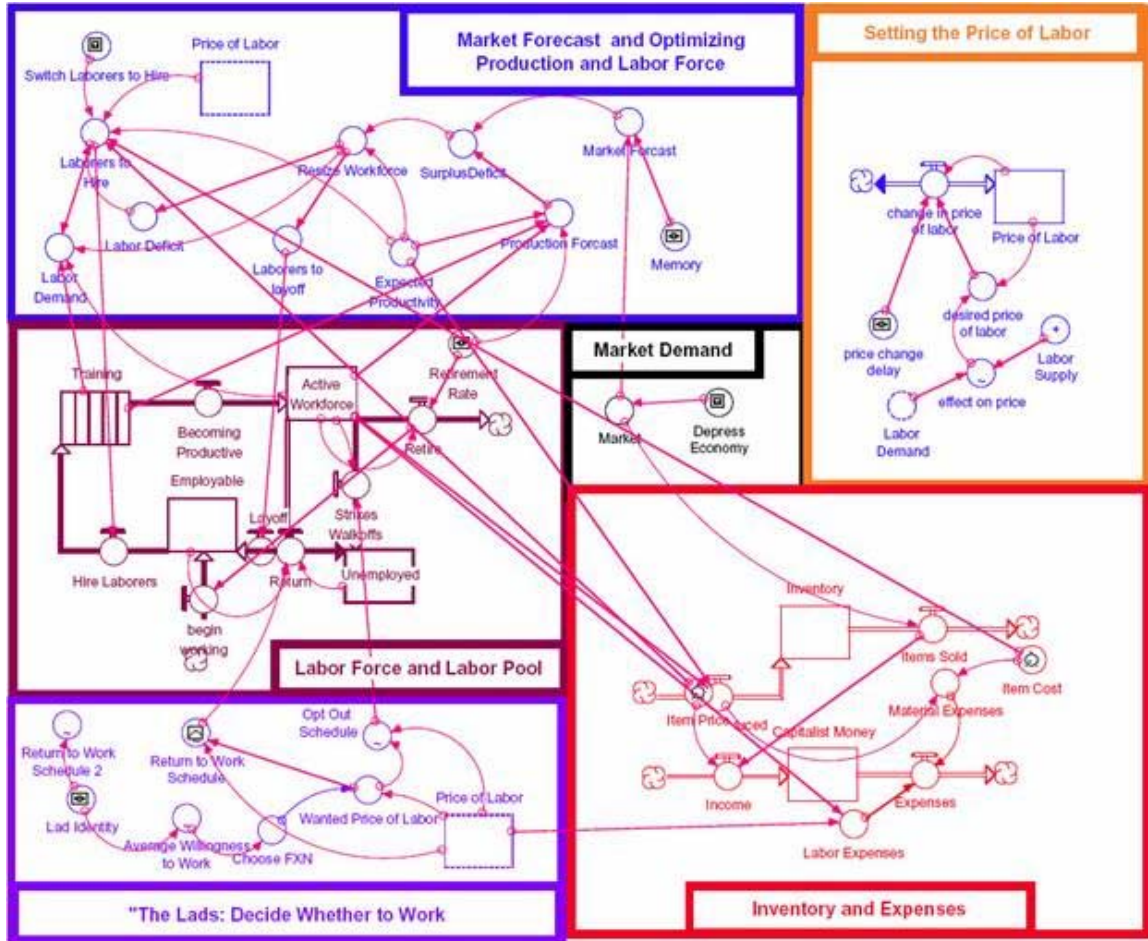
The business model includes a labor pool (labeled Labor Force and Labor Pool) which consists of those working, those who would take a job if one became available, and those who are unsatisfied with the price of labor and are opting out of the workforce. In the section labeled Market Demand there is a smoothed random function that determines the number of widgets the market will buy at every point in the simulation. In the section labeled Inventory and Expenses the simulation tracks inventory and capital, which are affected by income and expenses and market demand.

Unfortunately for the businessman, he does not realize that the market is truly random; he tries to predict its trajectory, and adjust his production goals and labor force in order to maximize profit. The price of labor, or wages, is governed by a supply and demand function (Whelan and Msefer 1996). When there is less demand for labor, wages go down, and when there is more demand for labor, wages go up.

Finally, the lads' decision making process is modeled in the section labeled, The Lads: Decide Whether to Work. The logic is that the lad who feels a strong sense of belonging to the group, or lad culture, will be more willing to work for less money. Likewise, a weaker sense of lad identity will make them more inclined to seek higher wages. Willis wrote that businesses actually preferred to have lads working for them, because they really didn't care about moving up a career ladder to white-collar work—



they didn't value this, and in fact disdained it. In the model, workers can always choose to take themselves out of the pool of surplus labor, Employable, or they can choose to quit their job, Active Workforce, and move themselves into the Unemployed reservoir, if wages ever drop too low.



*Figure 5: Schematic diagram of the model, "Industrial Business".*

**EXPERIMENTATION**

Willis states that only the lads, not other students, work during the school year (Willis 1977:39). In this sense, working during the school year is emblematic of lad culture. In order to explore the consequence of this statement, I tested the effects choosing to work had on: the development of lad identity, accumulation of profits by the industrial business, unemployment, and wages (Table 1). I also performed a counterfactual experiment by making interactions with women less likely to reinforce the development

of lad identity—in effect, testing how a feminist perspective might affect the development of lad culture. Finally, I simulated an economic depression by reducing demand in the Industrial Business model to test the effect on profits, and on other parts of this model that more directly affect the lads’ lives.

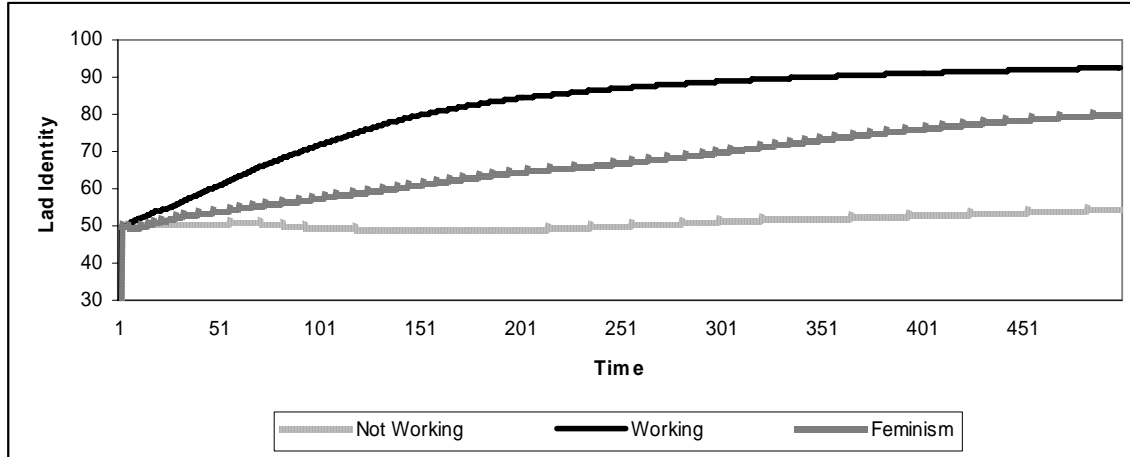
The results of these tests indicated that lad identity appears to be quite sensitive to choices that the lads make about working; lad identity grows significantly when they work, and less so when they do not work (Figure 6). What might explain this? Examination of the relationships in the model (Figure 4) indicated that this occurs because money can be earned at one point in time, stored, and used later. Thus, spending money is important because they have more control over its use than the other interactions in the model which occur randomly. In other words, when a lad has a day when nothing happens to reinforce lad identity, he can always spend money, and this will always reinforce the growth of lad identity.

*Table 1:* Table indicating the model in which experiments were run, dependent and independent variables, and a brief explanation how the simulation was configured.

<b>Test</b>	<b>Model</b>	<b>Dependent</b>	<b>Independent</b>	<b>Interpretation</b>
Choosing to Work	Lad Culture	Lad Identity	Switch Work (0,1)	When set to 1, Switch Work allows the lads to take a job (and earn money). If it is set to 0, they cannot take a job and thus cannot earn money.
Feminist Identity	Lad Culture	Lad Identity	Interaction with Female RLC (50,25)	The value indicates the percent chance that an interaction with a girl, if it occurs, will reinforce Lad Identity.
How Lad Identity Affects Business Profits	Industrial Business	Capitalist Money, Employable, Price of Labor	Lad Identity (89,53)	These values were the average levels of Lad Identity from the Lad Culture model when the lads were allowed to work (89) and when they were prevented from working (53).
Depressed Economy	Industrial Business	Capitalist Money, Employable, Price of Labor	Depress economy (0,1)	When set to 0, demand is a smoothed random function varying between 750-1250. When set to 1 demand is reduced by 300.

While Willis discussed the importance of working in the lives of the lads and in developing lad identity, he never suggested that its development hinges so significantly on their choice to work. To further explore this, I decided to test how the development of lad identity might change if their interactions with women were less likely to increase their Lad Identity. Figure 6 also shows that different gender relations than those described by Willis seem to have a somewhat less significant impact on lad culture than their decision to work. This is a significant finding because Willis’ interpretation of his evidence actually placed more responsibility on the preexisting unequal gender relations between men and women in driving the development of lad identity. While this simulation experiment does not refute this, it does suggest that Willis’ interpretation of

the comparative effect of working versus chauvinism on the development of lad culture might need to be revisited.

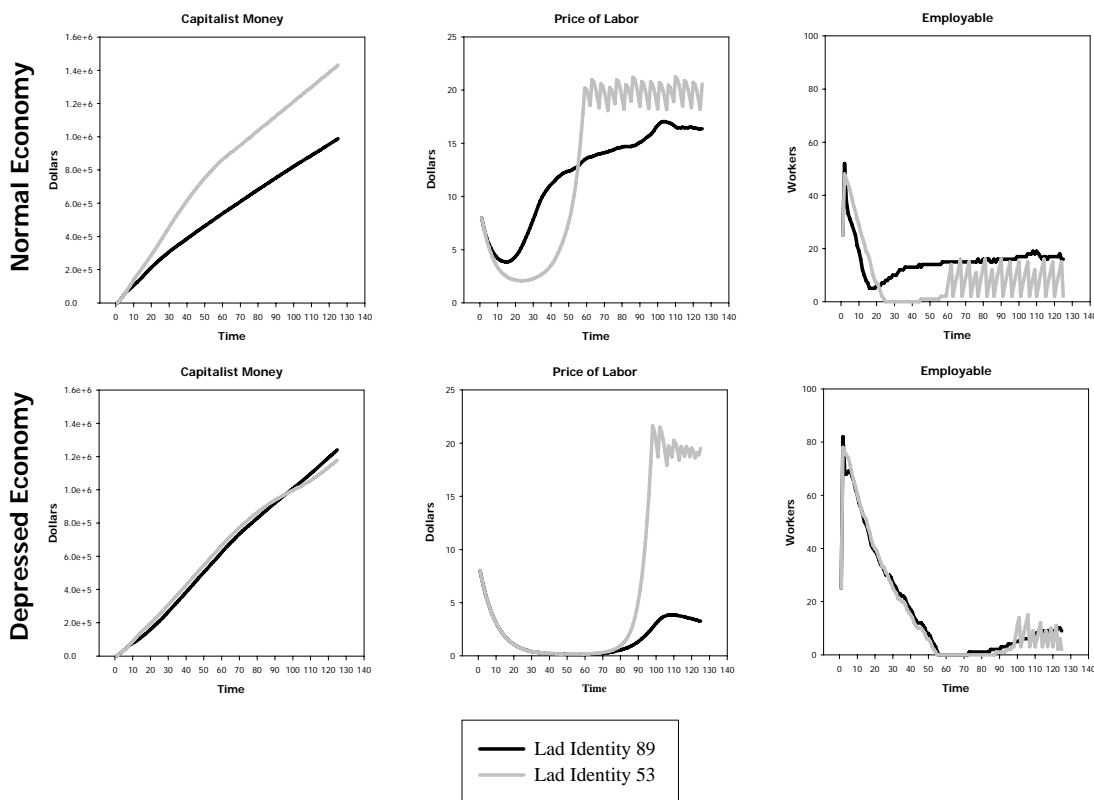


*Figure 6:* Results of experiments in Lad Culture model testing the development of Lad Identity.

The results of the simulation experiment run in Industrial Business are presented in Figure 7. The price of labor and unemployment are the parts of this system most affected by changes in the value of Lad Identity - these are the variables that would directly affect the lads' lives. The business' profits are affected somewhat, but the business is still profitable. The simulation results and examination of the modeled relationships (Figure 5) suggest that the business is more resistant because it has the option of optimizing workforce based on market demand. This function appears to be a quite powerful mechanism organizing other components of the system. Under a depressed economy, the effect on wages (Price of Labor) is more pronounced when lad culture is stronger, while profits are only somewhat affected. And if we were to think of the real-world implications of this, the effects on wages and unemployment probably represent a much larger disruption to the lives of the worker than the less dramatic effect on profits.

## GENERAL OBSERVATIONS

Throughout this project I kept track of my thoughts and observations of the simulation modeling process, problems I had building the models, and other observations during the experimentation. Some of these notes provided important insights into "Learning to Labor" and also how ethnographic research might benefit by incorporating simulation modeling.



**Figure 7:** Results of experiments in Industrial Business model. The first row is under normal demand conditions. The second row shows what happened when demand is reduced, simulating a “depressed” economy.

First, Willis does a good job describing social interactions and relationships that develop and reinforce lad culture. There were excellent ethnographic details to model the reproduction of lad culture. He also does well describing the cultural logic the lads use to decide whether to take working class jobs. Finally, he clearly answers his original research question: why do working class kids let themselves get working class jobs?

However, Willis does not identify the historical source of working class cultural values. I wanted these details when I was building the Lad Culture model in order to understand how the system evolved to the point where Willis begins his observations and to give more nuance to the interactions I programmed. Nor does Willis precisely identify the nature of the relationship between the lads and the industrial business. As I mentioned, I modeled this relationship based on the level of wages a worker will accept before refusing to work. While this is a reasonable inference, I would rather have solid ethnographic data for such an important link. Finally, Willis never discussed

counterfactual evidence or answered “when” questions. For example, does Lad Culture grow when the economy is depressed? Or, when does a lad stop being a lad? Not only would these details have helped me to create a more sophisticated Stella model, or possibly an agent-based model, but it would have given a more nuanced version of lad culture.

### **WHY NOT USE AGENT-BASED MODELING?**

The concept of emergence suggests that a group has properties that cannot be reduced to the actions of any one individual in that group. Lansing (2003) notes that social scientists as far back as Durkheim have been interested in the tension between individual actions (he cites, for example, the chances of an individual committing suicide) and group properties (versus national suicide rates). Agent-based modeling gives social scientists the ability to represent these systems and conduct virtual experiments with emergent properties that would be impossible with live populations.

There is a wide range of software packages available for both agent-based modeling and systems modeling; thus, it is important to choose the programming language best suited to one’s research goals. Initially, I wanted to use agent-based modeling to create my simulation of Willis’s ethnography. This seemed an appropriate approach because Willis’s ethnography examines “unintended consequences which act finally to reproduce not only a regional culture but the class culture and also the structure of the society itself” (Willis 1977:60). These unintended consequences appeared to me to be emergent properties of the lads’ culture and social environment and therefore could effectively be represented by an agent model.

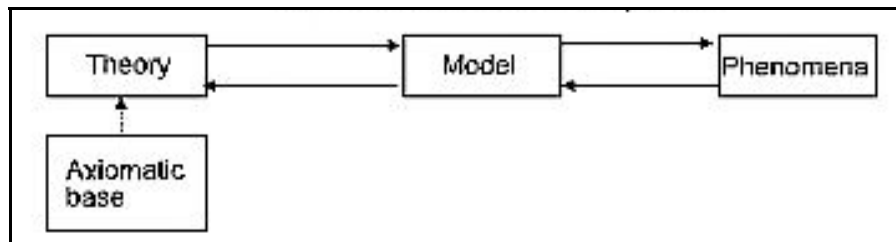
Unfortunately, this did not turn out to be possible. The ethnographic description Willis provided is aimed at exploring how the lads’ culture reinforced the structure of their society. While reproduction of an extant social structure was certainly an unintended consequence for the lads, it is not unexpected to find that industrial capitalism is a powerful force for social organization. In fact, close examination of “Learning to Labor” revealed little ethnographic evidence that would aid in building an agent model. This was surprising given Willis’ interest in individual agency rather than structural constraints. The information that was needed was an explanation whether, how frequently, and by what mechanism any of the lads avoided reproducing industrial capitalism. I would have needed to know how and when a lad both reproduces and escapes his place within the socioeconomic system. With this information, rules could have been created that defined how each agent in the agent-based model would respond to interactions with other agents in their social environment. The aggregate of these responses would be the emergent property of the system. The emergent property could then be compared to the unintended consequences to which Willis referred to see if the simulation model predicts the same behavior.

However, Willis seemed to assume the initial conditions of the ethnography (working-class culture) and also the endpoint (working-class jobs). This assumption was

clear from his description of the purpose of his research which was, first, to understand why working-class boys let themselves take working-class jobs, and, second, the fact that he sought out the subjects who were the most likely to go on to working-class jobs. There was an explicit assumption in “Learning to Labor” that working-class culture would reproduce itself through the lads’ actions, and the scope of ethnographic evidence supports this outcome. While Willis interpreted these data and explained the cultural logic that causes working-class boys to take working-class jobs, these interpretations and explanations did not specify how and when outcomes other than becoming laborers occur. Thus, Willis’s presumption of the final outcome of the lad’s interactions limited me only to the use of a systems-modeling approach.

## CONCLUSION

This paper demonstrates that the process of building a social simulation model and running experiments raises many questions and identifies assumptions contained within “Learning to Labor.” While it was not within the scope of this project to conduct further fieldwork, these questions and assumptions could be redirected back into the fieldwork in a circular fashion in which simulation refines the ethnography and the fieldwork refines the simulation model. One of the main contributions simulation modeling can make in ethnographic research concerns the potential of a symbiotic, iterative relationship between the process of simulation modeling and ethnographic research. The *semantic conception of theory* (Figure 8) is a form of scientific investigation that uses computational models to test the “truthlikeness” of observed phenomena (McKelvey 1999:12). In this approach a scientific theory is used to explain a model of a system, not the system itself. In other words, the process of scientific investigation will never reveal an exactly truthful explanation, but rather eliminate the least truthful explanations (McKelvey 1999:13). This is the case with the simulation models built for this project.



**Figure 8:** The semantic conception of theory in science is a model-centric view of science (McKelvey 1999).

The modeling process indicated types of data that the investigator may not have thought useful, such as information indicating when a lad stops being part of lad culture. Experimentation revealed cases where the significance the ethnographer attributed to one causal factor was not supported by the simulation, such as the case of the importance of

chauvinism in developing lad culture versus the significance of working. While I certainly do not suggest that these simulation results refute the validity of Willis' conclusions, I do suggest that it might be worthwhile to explore alternate explanations for the growth and development of lad culture.

Finally, it is important to acknowledge the role of the ethnographer cum modeler. Anthropologists are accustomed to being the primary mechanism for data collection and interpretation when conducting ethnographic studies. This relationship remains true with social simulation modeling. As I have demonstrated in this paper, a key role of the modeler is to interpret ethnographic data and transform them into a useful simulation model. It is important to observe the strengths and weakness of the data used to build the model. These provide insights and feedback that may improve the ethnographic interpretations. Similarly, the simulation results must be interpreted because these results are not predictions, but rather are tentative indications of the presence and directionality of relationships. Therefore, simulation modeling becomes another methodological tool, and the anthropologist remains in a familiar interpretative role.

#### **ACKNOWLEDGMENTS**

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