Critique of Brown and Boswell's "Strikebreaking or Solidarity in the Great Steel Strike of 1919"

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1 Introduction

In "Strikebreaking or Solidarity", Brown and Boswell use a game-theoretical approach to evaluate, alter, and reevaluate a decidedly *non*-game-theoretical theory of labour markets. The Great Steel Strike of 1919 has long been considered a "crucial test" (Brown and Boswell 1995: 1510) of *split labour market theory* (SLM), in which racial conflict is generated by a labour market which is noticeably split between two ethnicities, with the dominant and established race or ethnicity being paid higher than the minority (and often migrant) race(s) or ethnicity(ies) (Brown and Boswell 1995: 1479).

In August 1919, after half a decade of localized labour conflicts, 98% of AFL steelworkers voted in favour of an industry-wide strike in August 1919. Over 365 000 workers subsequently left their jobs, completely halting production in some plants. By December of the same year, although the strike retained its strength in some cities, it had become apparent that an industry-wide strike could not continue, and the strike was called off (Brown and Boswell 1995: 1496). While there were factors at the national level which took their toll on the strike, including skilled workers' reluctance to leave their jobs and the postwar financial strength of the steel companies, the dominating factor in the strike's failure was at the local level, where the steel industry was able to "undermine the efforts of the workers through violent intimidation and the widespread use of strikebreakers" (Brown and Boswell 1995: 1496; for a then-current analysis of the strike and its outcomes, see Foster 1920).

The majority of the strikebreakers were black workers imported from the South. According to SLM, minority strikebreaking tends to occur when minority workers are "disproportionately short-term sojourners who would not benefit from long-term struggles" (Brown and Boswell 1995: 1479). That the steel industry was a popular one for migrant black labour and that the majority of strikebreakers in the 1919 strike were black shows how the strike can serve as a "crucial test" for the theory.

2 Testing the theory

2.1 Gaps in the split labour market theory

The problem with SLM, claim Brown and Boswell, is that the theory makes no account of the converse situation: while SLM tries to explain a *lack* of solidarity, it only *assumes* that cases in which solidarity was maintained can be explained by a lack of a split labour market. The existing theory ""fail[s] to explain why and when people overcome an environment of racism to achieve

interracial solidarity" (Brown and Boswell 1995: 1479). Dissatisfied with this assumption, they set as their goal expanding SLM to explicitly account for both possible outcomes.

They intuitively identify four possible limitations of SLM that need to be accounted for in an expanded theory. First, the assumption of *primacy of sojourning migration* needs to be explicitly tested to address the possibility that strikebreaking blacks may not have been sojourners. Second, the *history of the dominant labour movement* needs to be included, as union locals in different cities might have been relatively strong or weak to begin with notwithstanding strikebreaking efforts. Third, since the strike was on a national basis, *government repression* is bound to vary from locale to locale. Lastly, the abovementioned assumption of SLM that *the absence of a split labour market explains interracial solidarity* needs to be explicit in a revised theory of split labour markets (Brown and Boswell 1995: 1481–1483).

2.2 Testing the theory

Brown and Boswell thus have a hypothesis about split labour markets which they need to test. They accurately identify the strikebreaking problem as one of collective action, and to test it they choose to use Heckathorn's (1989, 1990) model of an iterated mixed sanction system. Heckathorn's model of group-mediated social control is a particularly appropriate choice to use in this instance. It is explicitly designed to be applicable to nearly any problem of collective action with mixed sanctions (Heckathorn 1990a: 367). It is parametric in nature (Heckathorn 1990a: 369–370) enabling it to be easily adapted to particular situations by easily modifying sanction efficacy, monitoring costs, and so forth. It has been expanded by its author to account for stratified systems (Heckathorn 1990a: 370, 1990b). Most importantly, it accounts for the internal control capacity of the group being mobilized and efforts within the group to avoid spillover sanctions (Heckathorn 1990a: 367) where the entire group is punished for one member's infraction.

Heckathorn's theory of collective action models the problem of collective action in terms of an *agent* (imperfectly) capable of monitoring and sanctioning group members for defection, and a *heterogeneous group of actors* in a mixed sanction system in which group members are subject to sanctions directed at individual actors (*individual sanctions*) and those directed at all members of the group (*collective sanctions*), such that the spillover from collective sanctions influences the creation of *compliance norms* in which members of the group attempt to regulate one another's actions to avoid negative effects of sanctions for others' actions (Heckathorn 1990a: 366–367). In this system, Heckathorn identifies a *free-rider problem*, in which individuals may be tempted to benefit from collective action without incurring the costs of engaging in it (Heckathorn 1990a: 368); in the case of the 1919 strike, receiving the higher wages and improved working conditions which union victory would achieve for all workers, without participating in the strike itself (Brown and Boswell 1995: 1486). At the same time, there exists a *second-order free-rider problem* where actors may be tempted to benefit from the compliance norms created to prevent free riding without incurring the costs of creating and maintaining those norms (Heckathorn 1990a: 368); in the case of the strike, for example, failing to discourage others from working as scabs (Brown and Boswell 1995: 1486).

As such, Heckathorn (1990a: 368–369, 377) identifies six possible pure strategies which an actor might follow in a mixed sanction system. *Full cooperation* involves cooperating at the first level by producing the public good and cooperating at the second level by enforcing compliance norms; in this case, participating in the strike and encouraging others to participate. In *hypocritical cooperation* the actor fails to cooperate at the first level but cooperates at the second level; for instance, encouraging others to picket while crossing the picket line himself. *Private cooperation* involves cooperating at the first level but not at the second—not crossing the picket line, but not encouraging others to do the same. An actor who neither strikes nor encourages others to strike engages in *full defection*, failure to cooperate at either the first or second level.

Considering third-level behaviour—that is, compliance norms about maintaining compliance norms, what Axelrod (1986) labels "meta-norms"—there are two further strategies, which involve active efforts to oppose compliance norms. With *hypocritical opposition*, the actor cooperates at the first level, but at the second level not only fails to cooperate but encourages others not to cooperate at the second level (itself third-level behaviour), while in *full opposition* the actor fails to cooperate at the first and second levels while actively encouraging others not to cooperate at the second level. In the case of the strike, hypocritical opposition might consist of refraining from crossing the picket line while not discouraging others from doing so by picketing, while full opposition might consist of not only crossing the picket line but encouraging others to do so. Oppositional strategies enable actors to actively prevent individually-rational but group-irrational outcomes, Pareto-suboptimal equilibria in which compliance norms are strong enough that individual costs exceed collective gain (Heckathorn 1990a: 377).

Heckathorn spends an entire article (1990a) deriving payoff functions for all six strategies, so I am unable to account for them all here. It should be noted, though, that for any strategy, the payoff becomes a linear function incorporating actor's opportunities to engage in a particular first- or second-level behaviour (both ego and others), the strength of both the collective and individual sanctions, the efficacy of control and of monitoring, the costs to the individual of cooperating at the first and second level, and the size of the group (Heckathorn 1990a: 373). Actors are assumed to engage in self-interested maximizing behaviour[1], and each actor makes a decision in turn; in a group of N actors, an actor's decision can only change on the $(N+1)$th turn, although since each actor is making decisions about whether or not to incur collective sanctions and whether or not to engage in enforcing compliance norms, an actor's *behaviour* can change on any turn (if, for instance, the opportunity to free-ride at the first level ceases to exist) (Heckathorn 1990a: 383).

Brown and Boswell modify the model in two important respects: first, they account for differing opportunities to exert compliant control and differential payoffs for engaging in first-level compliance for the three groups present (that is, the local ethnic majority, the local ethnic minority, and ethnic minority sojourners); and second, they decide that a drop in compliance below 50% diminishes the strength of sanctions and the efficacy of monitoring by 3% to reflect the union's reduced ability to organize over the long term (Brown and Boswell 1995: 1489). Neither of these modifications impact the outcome of Heckathorn's model, which was constructed to account for

[1]Note that such behaviour need not require perfect calculative ability. Heckathorn (1996) demonstrates that the outcomes of forward-looking (rational choice), backward-looking (learning) and sideways-looking (observational) approaches converge.

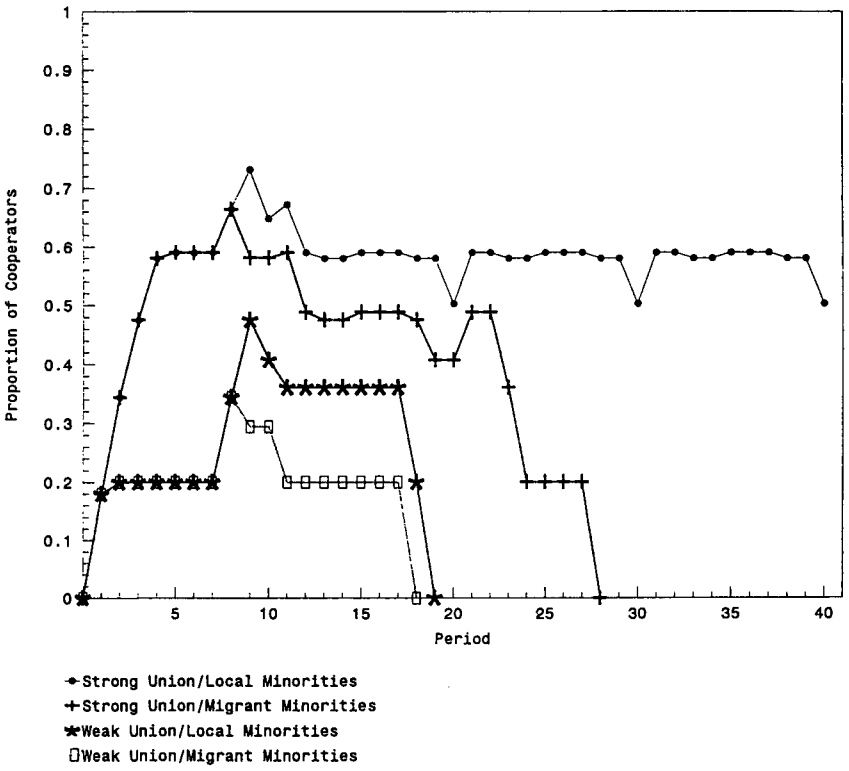

Figure 1: Formal model of labour market group compliance levels.

modifications of this sort (Heckathorn 1990a: 369). Plotting compliance over time, they reach the results shown in Figure 1.

The conclusion is straightforward. There is no question that the strength of the union (that is, its ability to enforce compliance norms) has a significant effect; in fact, while migrant minorities doom the group to eventual failure (0% compliance), groups without migrant minorities *also* fail in the absence of a strong union. From the results of this model, they conclude that SLM does not adequately account for conditions in which solidarity is maintained, and modify SLM to expect higher levels of solidarity where a union is comparatively strong *and* recent migrants are few (Brown and Boswell 1995: 1492). But in comparing the expanded SLM to the empirical evidence of the strike[2] they notice that two cities, Cleveland and Wheeling, experienced solidarity despite having either migrant workers or a relatively weak union (Brown and Boswell 1995: 1502).

Brown and Boswell set about identifying other possible independent variables by using qualitative comparative analysis; I omit a description of that methodology due to space considerations.[3] Important to us is that the outcome of their analysis was the identification of a further factor

[2]Brown and Boswell (1995) summarize the conditions of the failure of the strike in pp. 1492–1496.

[3]On qualitative comparative analysis, see Regin (1987).

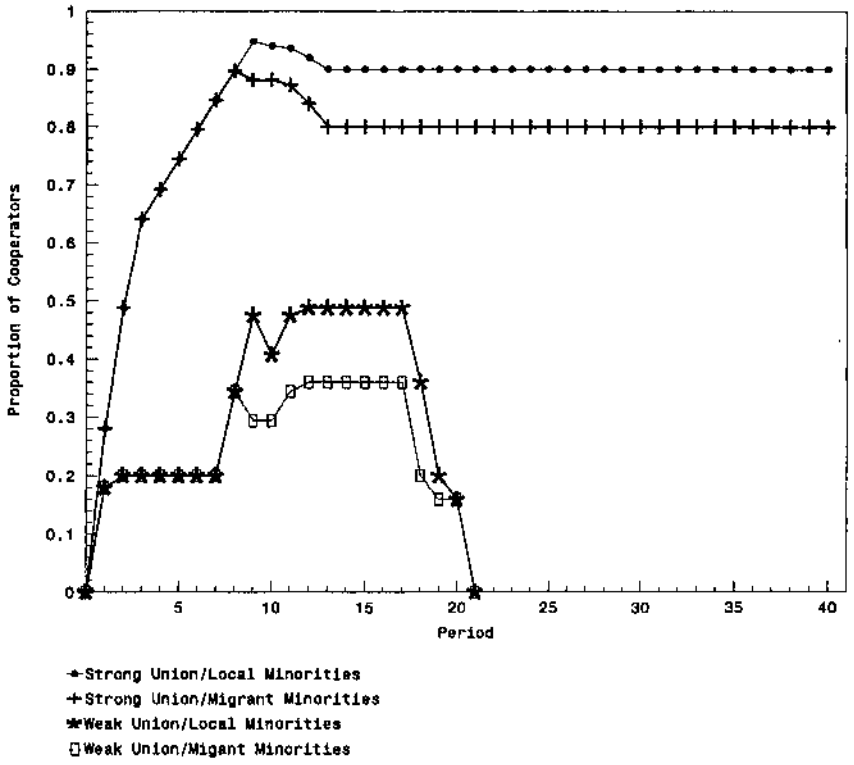

Figure 2: Revised model of group compliance levels, pro-union government.

necessary to identify all possible combinations of conditions and outcomes: the repressive nature of the local government (Brown and Boswell 1995: 1505). They modify their collective-action model to account for the increased external sanctions reflective of a repressive local government and recalculate the outcomes. Figure 2 illustrates the situation of a pro-union government (with lighter external sanctions), while Figure 3 illustrates the same situation with an anti-union local government (with harsher external sanctions).

It is immediately apparent from these graphs, derived from the application of Heckathorn's model of formal action, that the key to maintaining solidarity—that is, an equilibrium at a level of compliance higher than zero percent—is a pro-union local government. In other words, even with migrant minorities, the combination of a strong union and a pro-union government is sufficient to establish labour solidarity (Brown and Boswell 1995: 1508). Brown and Boswell accordingly modify SLM to account for the necessity of a pro-union government to establish racial solidarity (Brown and Boswell 1995: 1509).

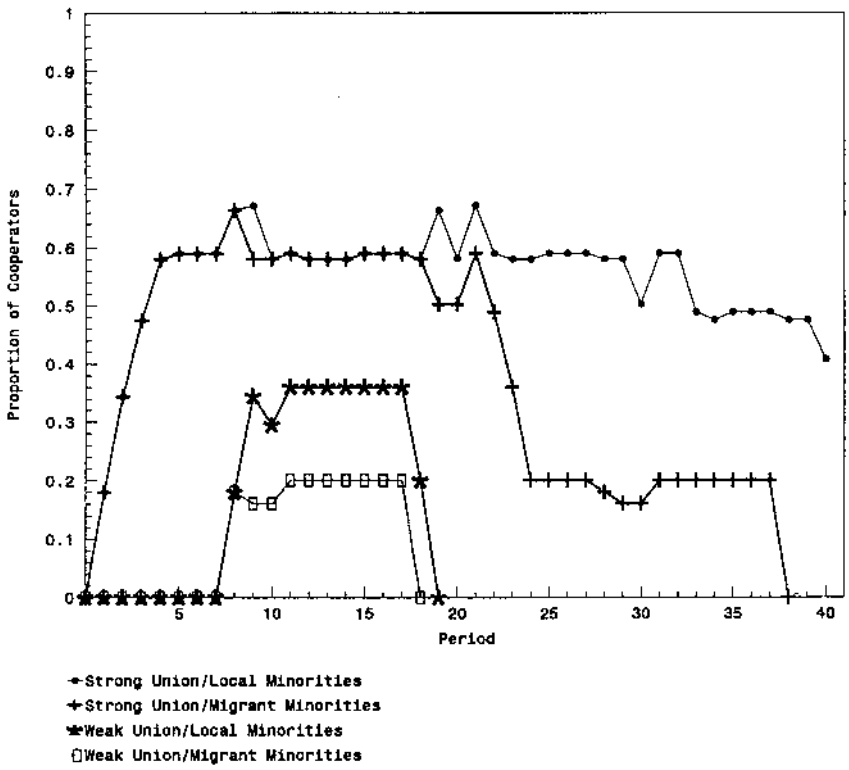

Figure 3: Revised model of group compliance levels, anti-union government.

3 Discussion

3.1 Methodological advantages

What Brown and Boswell manage to do here—aside from correcting an important inadequacy in the split labour market theory—is to demonstrate how game theory can be productive in sociology without having to write *about* game theory. Their methodology recalls the scientific method: they construct a *hypothesis* on the effects of certain variables on union solidarity; they devise an *experiment* by which they can test the hypothesis (by observing the output of Heckathorn's collective-action model); they execute the experiment and *evaluate the results*, and when the results of the experiment are inconclusive, they use them as a *feedback* loop to formulate another hypothesis.

What makes Heckathorn's model particularly effective for this analysis is that it was explicitly designed to be general—that is, not a model of a particular situation as in Kahana and Weiss, below,[4] but a general model which others are able to appropriate, easily modify, and apply to a wide variety of situations to produce easily-interpreted results. What contributes to the success and straightforwardness of Brown and Boswell's analysis of SLM is that they are relieved of the responsibility of demonstrating the effectiveness of the model and can instead concentrate on producing results. The mathematical requirements on Brown and Boswell were to ensure that they accounted for the particulars of the situation in ways which would not negatively affect the reliability of the model—means for which Heckathorn provides in (1990b)—and then simply to put representative values out and plot the output, which essentially speaks for itself.

3.2 Generalized methodology

The general principle at work here is essentially an academic *division of labour*. Establishing the reliability and accuracy of the model has required extensive work on the part of Heckathorn, as evidenced by the large body of work he has produced on it (including a few articles not referenced here). By presenting and supporting the formal model separately, Heckathorn enables Brown and Boswell to use it as a tool, applying it to their specific problem domain and drawing conclusions from the results it produces. In other words, the academic roles of game theorist and of labour-market theorist are distinct but their efforts produce a single result, just as, for instance, the owner and worker in the classic industrial division of labour, or the working head of the household and the housewife in the classic household division of labour.

Separating the mathematics of game theory from the application of the theory is standard practice in many of the disciplines in which game theory is applied in a practical manner: in economics, where the abstract economic model is maintained as an ideal to which real-world economies more or less conform; in computer science, where the theories of the game theorists become ideal types in the form of algorithms and libraries; in biology, where theories of evolutionary behaviour are developed independently from the evolutionary traits of a particular species (Binmore 1992: 16–

[4] Not yet written

19). The 'soft' social sciences—sociology and its variations, and political science, for game theory is all but unutilized in anthropology—seem for the most part to have not yet adopted such a division of labour which leaves the mathematics to the mathematicians and social theorists and the practical implications to the rest. Instead, as I demonstrate below,[5] the burden of establishing the mathematical soundness of a particular approach to a problem is left to those trying to solve the problem in the first place.

This academic division of labour presents three outstanding advantages. Firstly, it *encourages the reuse of general formal models*. This practice enables a variety of problems in divergent areas of the social sciences to be addressed with the same model. This not only saves those who wish to apply the model the trouble of having to develop it first, but allows those formulating and developing the model to do so unencumbered by having to demonstrate practical results. At the same time, it encourages the game theorist to develop a robust model; it is one thing to gloss over an assumption in the short exposition of a model being used once, but it is considerably less acceptable to do so when the intent of your work is to produce a general tool to be applied to many different problems by a variety of other authors. One interesting side effect of this practice is that it can lead to the detection of similarities within areas of research which at the surface are extremely dissimilar.

Second, it *encourages specialization*, such that a smaller number of social scientists need to be game theorists in order to take advantage of the insights which game-theoretical methods can produce. Both the requisite formal mathematical background and the ability to identify and construct abstract models are assets possessed by relatively few (and are assets which might draw one into disciplines outside the social sciences), while those who could benefit by having game-theoretical tools on which to draw in their practical research are greater in number. Leaving the development of sociological game theory to those whose research role is explicitly that thus produces positive benefits both on the robustness and innovativeness of the models produced and of the ease in which they can be integrated into research without having been the theorist who formulated them.

Lastly, it *improves accessibility* by separating the technical formulation of the model from its application. Brown and Boswell provide a particularly effective example of this; the mathematical prerequisites for the reader of their article are reduced to the ability to interpret graphs, and a general understanding of equilibrium, costs and payoffs, and first, second, and third-order effects (all of which are addressed by Brown and Boswell). Meanwhile, those interested in the model itself are referred to an appendix, or better yet, to Heckathorn's articles themselves. As anecdotal evidence of the propensity for papers based heavily upon game theory to present a barrier to the general reader, I recall an instance while preparing this paper in which both my advisor and a reference librarian expressed concern about the mathematical requirements necessary to understand Van Kolpin and Singell's article on discrimination in baseball discussed below.[6] Were such a division of labour as that which I recommend adopted there, the conclusions of the article with respect to discrimination and baseball might have been more accessible to those who while sociological experts are mathematical laymen.

[5] In the review of Kahana and Weiss's analysis of absenteeism, to be forthcoming

[6] That is, in a forthcoming critique.

3.3 Objections

Two objections might be raised against such a division. First, it might be suggested that the circumstances arising in Brown and Boswell's study—in which a very well-documented historical event has been theorized upon, and that theory is expanded through game theory—might be so uncommon an approach as to make a poor platform on which to develop methodologies. As it happens, it is not necessary that the events be *historical*; only that there is empirical evidence to match not only results but the model itself. It is, as we will see later,[7] possible to match results without matching the model, in which case having reached the correct results can be viewed as nothing more than coincidence at best or back-fill at worst; but if the model accurately represents a simplification, and not a distortion, of a real thing, and the outcome of the model matches the outcome of the real thing, then the conclusion cannot be said to be unreliable on the basis of methodology. But without such empirical evidence, the researcher is left with nothing to compare against: a game-theoretical model with no parallels in non-game-theoretical theories or in real events is a theory, not a methodology, and must be demonstrated correct outside of itself.[8]

The second objection is somewhat more serious: If such a division is adopted, would later work not be delicately balanced upon prior conclusions such that any flaws in the early work brings down all of the work based upon it, in the manner of a house of cards from which a card is removed from the base? The simple answer to this objection is "Yes, it would"—but with the qualification that it is no different than any *other* body of scientific knowledge in that respect. Social-science game theorists seem to have a tendency to prefer inventing their own wheels by generating models from first principles in each study, but elsewhere in the social sciences—and even more so in economics and the hard sciences—relying on the theoretical work of others is *de rigeur*. It is an expected risk of academic work. (Consider, for example, the effect upon the physicist if it were discovered that the theory explaining gravity were to be found to be inaccurate—yet a similar revolution has happened for nearly everything in physics *but* gravity, and the discipline survived.)

Through the judicious application of Heckathorn's formal model of collective action in a mixed sanction system, Brown and Boswell are able to quickly and clearly identify weaknesses in the existing SLM theory of industrial solidarity, test the effects of new variables, and convincingly put forth a modified SLM theory which accounts for both their results and for the identified cases which were not accounted for in the original theory. To be able to generate such important findings and to present them in such a clear manner is a direct result of their having taken advantage of a pre-established game-theoretical model, demonstrating the utility of a division of labour between the game theorists—social scientists who develop abstract, general, and parametric models of social phenomena—and the social researchers who use those tools to address specific questions of sociology.

[7] In Schroeder and Rojas' study of AIDS transmission, forthcoming.

[8] Recalling, somewhat loosely, Gödel's theorem of incompleteness.

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