



The effects of group composition in a strategic environment: Evidence from a field experiment[☆]



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ABSTRACT

Recent theoretical and empirical studies have explored the effect of group membership and identity on individual decision-making. This line of research highlights that economic models focusing on the individual as the sole entity in the decision-making environment potentially miss critical features. This study takes this literature in a new direction by overlaying a field experiment onto a setting where groups have arisen naturally. Our experimental laboratory is large open air markets, where we are able to examine the effects of group membership on seller's collusive behavior as measured by prices and surplus allocations. This permits us to explore strategic implications of group composition. Empirical results illustrate the importance of group composition on pricing decisions, and show that deviations from Nash equilibrium are crucially related to group membership.

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"The desire to earn the approval, or to avoid the contempt, of those around us is a stimulus to action which often works with some uniformity in any class of persons at a given time and place. A professional man, for instance, or an artisan will be very sensitive to the approval or disapproval of those in the same occupation, and care little for that of other people..." Alfred Marshall, *Principles of Economics*.

1. Introduction

Even though great economic philosophers have scribed of the importance of group membership and social identity on individual behavior, standard economic analysis typically eschews such forces, instead focusing on micro-level incentives when modeling individual decision-making. Recently, a research agenda within economics has begun to recognize the importance of group membership and social identity on both individual behavior and market outcomes.² The approach in

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² This absence of the study of groups does not extend to other disciplines, as social psychologists (e.g., [Tajfel and Turner, 1979](#)), anthropologists (e.g., [Murphy, 1957](#)), sociologists (e.g., [Sumner, 1906](#); [Coser, 1956](#)) and political scientists ([Miller et al., 1981](#)) have explored group issues for decades.

the literature revolves around exploring how group membership and group composition impact preferences, which in turn affect behavior and outcomes. An important contribution in the preference-based research is [Akerlof and Kranton \(2000\)](#), who add social identity as an argument in the utility function and allow disutility from deviations for societal prescriptions based on that identity.

The research program also contains a number of innovative laboratory experiments in which subjects are assigned to groups as part of the experimental protocol. In some of these experiments, such as [Eckel and Grossman \(2005\)](#), [Charness et al. \(2007\)](#), and [Hargreaves Heap and Zizzo \(2009\)](#), assignment of laboratory subjects to groups is random. Other experimental protocols, such as implemented by [Chen and Li \(2009\)](#), [Klor and Shayo \(2010\)](#), and [Li et al. \(2011\)](#) use individual characteristics as the basis for group assignment, i.e., art preference or college major. A related line of inquiry, such as [Goette et al. \(2006\)](#) and [Leider et al. \(2009\)](#), explore the impact of group identity using subjects drawn from naturally occurring groups – i.e., platoon members in the Swiss Army or students in Harvard dormitories. These studies find that regardless of how groups are formed, subjects behave more favorably to members of their own group and less favorably toward others outside of their group. Yet group salience matters – the magnitude of such effects depend crucially on the extent to which the experimental protocol triggers a group identity frame.

The literature uniformly takes a “behavioral” or preference based approach to group identity. In doing so, the literature overlooks more neoclassical features that arise as a result of group composition. This is the gap that we tend to in this study – we emphasize how group composition affects both the strategies and information available to members. Specifically, we explore how these factors impact the ability of groups to cooperate and affect prices in naturally occurring markets. In this regard, we add to a literature that has previously focused on preference-based implication of group composition.

We begin by developing a conceptual framework to compare the behavior of two distinct seller groups in a decentralized bargaining market; (i) insider only groups which contain four sellers with an ongoing relationship outside of our experimental market and (ii) mixed groups that contain three sellers in an ongoing relationship and a fourth seller who is not involved in this relationship. This distinction between groups has direct implication for the types of strategies that can be used to support and sustain anti-competitive prices.

The ongoing relationship for an insider only group introduces opportunities to sustain cooperation through threat of punishment in future interactions. Mixed groups in contrast, have an outsider who cannot be punished in subsequent interactions. In a standard, game theoretic framework, this implies that the types of cooperation that can be sustained in outsider only groups may prove infeasible for mixed groups. Yet, outsiders might make promises to cooperate to overcome the absence of later interactions. However, due to a lack of prior interaction, insiders may not be able to gauge whether outsiders are morally compelled to keep promises and thus undertake efforts to determine the outsider's compulsion to abide by agreements.

With these considerations in mind, we posit different strategies that insiders might pursue in mixed markets and describe the associated pricing dynamics. An “accommodating” strategy treats the outsider as a “competitive fringe” player and has the three insiders collude by restricting overall sales volume. A “benchmarking” strategy restricts insider volume in early periods to gauge the cooperativeness of the outsider. Pricing decisions in subsequent periods depend on what insiders learn about the outsider's “type”. Finally, a “competitive” strategy foregoes any attempt at cooperation and simply follows competitive pricing.

We next present empirical evidence drawn from two distinct naturally occurring environments: open air markets and sportscard shows.³ To observe natural interactions within these markets, we examine outcomes across several multilateral, decentralized bargaining markets that include 12 buyers and 4 sellers. In each market type, we provide evidence that such markets can produce outcomes that closely approximate competitive predictions. This result is important as it shows that when such markets are allowed to function reasonably freely, there are certain predictable consequences for how they operate.

To examine the importance of group formation on the stability of cooperation, we make use of a series of exogenous variations when forming seller groups.⁴ When seller groups are comprised solely of local vendors they are able to sustain a stable super-competitive price. That cooperation only arises once we afford sellers the opportunity for explicit, pre-period communication is supportive of prior work highlighting that communication – not just repeated interaction – is the key drive of collusion (see, e.g., [Compte, 1998](#); [Kandori and Matsushima, 1998](#); [Genesove and Mullin, 2001](#); [Kuhn, 2001](#)).

When seller groups include both local vendors and a single vendor drawn from an outside marketplace, the stability of cooperative arrangements is compromised. In such settings, prices tend toward the competitive range after a few market periods. In fact, by the final market period we fail to reject the null hypothesis of competitive pricing. By highlighting the importance of group composition on seller behavior and market prices, our results contribute to the growing body of experimental work exploring how factors such as leniency programs ([Bigoni et al., 2012](#); [Hinloopen and Soetevent, 2008](#);

³ For an overview of the existing literature examining economic institutions and behavior in open air markets see [Sherry \(1990\)](#). Albert LaFarge, author of *U.S. Flea Market Directory*, notes that “Today's American flea market is a modern version of a phenomenon that has endured throughout history in all civilized societies – wherever there is a high concentration of people, there will be market days when they assemble for the exchange of goods and services.” For a more thorough discussion on sportscard markets see [List \(2004\)](#).

⁴ In this spirit, our approach shares similarity with [Goette et al. \(2006\)](#) who exploit random assignment to platoons during officer training in the Swiss Army as a way to exogenously vary identity within naturally-occurring groups. Yet, [Goette et al. \(2006\)](#) examine behavior in a very different setting – prisoners' dilemma games with and without third party punishment.

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