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The Role of Cooperation and Prosocial Behavior in Food Buying Clubs: An Exploratory Study

Afton Hupper
University of Maine

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THE ROLE OF COOPERATION AND PROSOCIAL BEHAVIOR IN FOOD BUYING

CLUBS: AN EXPLORATORY STUDY

By

Afton E. Hupper

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Advisory Committee:
    Timothy M. Waring, Associate Professor, School of Economics, Adviser
    Caroline Noblet, Assistant Professor, School of Economics
    John Jemison, Jr., Extension Professor, Cooperative Extension
    Sharon Tisher, Lecturer, School of Economics, Honors College
    Ethan Tremblay, M.S. Candidate, Resource Economics and Policy

ABSTRACT

Buying clubs arise when a group of individuals convenes to use their collective purchasing power to obtain bulk quantities of items, in this case food, at per-unit prices lower than offered by traditional grocers, or specialty items that are difficult to find. As cooperatively-structured groups, it is hypothesized that they function on the core principles of cooperation, reciprocity and other prosocial behaviors which support the benefit of the group rather than individual benefit. This research aims to test this by observing, identifying and analyzing behaviors which are instrumental in the success or failure of buying clubs, and by measuring cooperation empirically with two experimental economic games. I am interested in the relationship between institutions and cooperation, and one way to examine this is through the work of Elinor Ostrom. We examined the influence of institutional factors including cooperation, measures of participation, and successful collective action to see if they were greater among members of buying clubs with more rules corresponding to Elinor Ostrom's institutional design principles. While no strong association between the design principles and buying club cooperation was found, participants in this survey donated nearly twice the expected percent of their endowment in each experimental game, suggesting that the buying club members in this study are more cooperative on average than members of the general public.

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TABLE OF CONTENTS

List of Figures

List of Tables

List of Formulas

CHAPTER I

1.1 – Background

Living on a finite planet, humans are fundamentally challenged to allocate and manage natural resources for long term survival. Scarcity, a product of many elements including overexploitation of resources and social inequality, has driven many societies throughout history to collapse. Classic examples of this include the Rapa Nui of Easter Island and Norse Greenland societies, who squandered their resources by failing to manage them for long term sustainability (Diamond, 2005). The management of natural resources is closely connected to the ways societies manage their human population. This is demonstrated throughout history in comparing societies that succeed to those that collapse, often due to the failure of institutions to create inclusive, participatory economic conditions for their citizens. A classic example of this is the case of North and South Korea, sister nations with an enormous socioeconomic disparity (Acemoglu & Robinson, 2012).

Despite a pattern of resource depletion and related societal demise throughout human history, it was not until the mid-nineteenth century that many individuals began to recognize that the life-sustaining properties of the Earth are limited, and that economic and material growth cannot continue infinitely (Meadows, Meadows, & Randers, 1972). Although the issue of environmental limits leading to human crisis has been brought to the attention of world leaders, serious action has yet to be taken on a large scale, and humans continue to face sustainability problems around the world. Former US President Barack Obama has cited climate change as the greatest threat to the future of the world.

The Amazon rainforest, one of the most productive, diverse and ecologically sensitive ecosystems on the Earth as well as a vital carbon sink, lost 7,989 square kilometers of forest, roughly the size of Connecticut state, to clear cutting from 2015-2016, a 29% increase from the previous year (National Institute for Space Research, 2016). With the supply of arable land, fresh water, and clean air diminishing, the growing need for solutions has launched the social sciences into new territory. While economists have traditionally concerned themselves with the mechanisms of uninhibited growth, rooted in neoclassical economic theory, new movements have formed that take into account the limits and value of the natural world and the human relationship to it; these include the sub-disciplines of resource, behavioral, and ecological economics, which provide useful frameworks for evaluating sustainability issues and crafting solutions that will be needed in the coming decades as we face the ever greater global environmental challenges.

Scholars of various disciplines have contributed to a body of literature that focuses on the issue of natural resource management. Garrett Hardin's 1968 paper *The Tragedy of the Commons* was influential in that it helped the scientific community see that resource management is often a social dilemma, where the optimal choice for an individual runs counter to the choice that most benefits the group (Archetti, 2012). Hardin describes the challenge of sustainability through the example of a group of herders who graze their animals on an open pasture. Because each individual seeks to maximize her gain in this system, she will continue to add animals to the commons, causing the commons to be overgrazed. Hardin suggested that to avoid a tragedy of the commons requires either government regulation or privatization of resources. This solution was expanded by economist Elinor Ostrom, who found that solutions to this

2

dilemma often emerge and evolve organically within collective action institutions. Ostrom demonstrated that common-pool resources can be managed successfully without falling victim to the tragedy of the commons.

Ostrom dedicated her life to the study of groups of people who manage common-pool resources (CPRs), both successfully and unsuccessfully. What she found revolutionized the field of sustainability and earned her a Nobel-memorial Prize in economics. Ostrom's work outlines a series of eight institutional design principles commonly employed by long-enduring CPR institutions that address the many challenges posed by the tragedy of the commons. These principles include: 1. Clearly defined barriers to entry as well as physical boundaries of the CPR; 2. A congruence between appropriation and provision of rules and local conditions; 3. Collective-choice arrangements; 4. Monitoring; 5. Graduated sanctions; 6. Conflict-resolution mechanisms; 7. Minimal recognition of rights to organize; and 8. Nested enterprises (Ostrom, 1990). Ostrom's influence has spread beyond the realm of common pool resource management to fields such as behavioral economics. Importantly, new literature in this discipline has indicated that Ostrom's principles can be applied to many different types of groups, beyond those managing natural resources, making them a useful lens through which to study and understand group decisionmaking in light of sustainability challenges (Anderies & Janssen, 2013). Other scholars have argued the design principles may be applied to nearly any type of group to improve their long-term collective success (Wilson, Elinor Ostrom, & Michael E. Cox, 2013). The present research builds on the work of Ostrom, Wilson and other economists, which has suggested that cooperation is a key factor in solving sustainability challenges. This study uses those principles in

confluence with the role of cooperation as a framework to study the organizational structure and social impacts of food buying clubs. Buying clubs have been selected precisely because, along with other local food institutions, they are believed to require elevated levels of cooperation to emerge and persist over time (Tremblay & Waring, 2015).

1.2 – Buying Clubs and the Cooperative Structure

Food systems are a major focus of sustainability science because they appropriate a vast amount of energy and natural resources and produce vital sustenance for human life. The dominant industrial food system in the United States, while providing an abundant supply of calorie dense and inexpensive foods, poses many problems for environmental, health, and animal welfare concerns (Pollan, 2006). Cooperation and collective action have been identified as key components of sustainable food systems, which offer a more community-based approach to solving issues related to food justice (Ikerd, 2012). They allow for individuals to form connections with growers and make educated choices about the foods they consume, giving them greater influence over the system as a whole.

Cooperative food systems, including organizations such as food hubs, farmers' markets, community-supported agriculture (CSA), buying clubs and food co-ops, typically operate on the principles of participatory democracy, solidarity and reciprocity (Renting, Schermer, & Rossi, 2012). Such organizations allow consumers to actively participate in and establish more democratic control over the food system. When

consumers move away from the mainstream marketplace to join a buying club or purchase a CSA share, new channels of consumption are opened and freedom of choice is strengthened. Additionally, these cooperatives provide social and collective capital and a common food ethic that brings members of different backgrounds together (Little, Maye, & Ilbery, 2010). Further, the cooperative organizational structure has been shown to serve as a catalyst of socioeconomic transformation, particularly in rural parts of the world, where agriculture is the main economic driver. In India, for example, dairy and sugar cooperatives provide employment and financial safety nets to farmers who once relied on money lenders for assistance. In addition, these cooperatives have established facilities like schools, hospitals, and stores in rural areas that have aided in the economic development of impoverished communities throughout the country (Anandaram & Dubhashi, 1999). Because the cooperative model provides benefits that go beyond the food system, understanding cooperatives is important for the field of sustainability and to the study of collective action problems in general (Anderson, Brushett, Gray, & Renting, 2014). Here I report on a study of the most informal of food cooperatives, the food buying club.

Buying clubs are organizations that arise when a group of individuals convenes to use their collective buying power to purchase bulk quantities of items, in this case food, at per-unit prices lower than offered by traditional grocers or specialty items they cannot get elsewhere. Buying clubs represent a form of marketplace exit, in which groups of individuals decide to purchase items outside of the mainstream business environment in order to exert more control over the goods and services they desire (Herrmann, 1993). These groups cut out the retail middleman by ordering items directly from wholesalers,

and sometimes local farmers, often saving members money and providing them more freedom of choice. Due to its unique structure, this model may rely more heavily on coordination, reciprocity and cooperation than other, more traditional market venues, an idea which is tested by this thesis. These features are often exhibited in the purchasing behaviors of buying club members, particularly when individuals work together to create split orders. Splits occur when two or more members contribute their funds toward the purchase of a larger item to be divided and redistributed after the order has been received. The size and frequency of split orders is a useful metric that can be used to compare levels of cooperation across buying clubs, because they are a product of individuals working together toward a common goal and often making a sacrifice to help others. For instance, a buying club member may choose to help others purchase certain items that they do not particularly care for, or that they would not choose to purchase on their own, thus demonstrating the ability to cooperate with others. Because economic studies focus largely on competition rather than cooperation, the social structure of food buying clubs provides a unique and interesting model for the study of prosocial behavior in an economic context. This project investigates whether and to what extent the social organization of food buying clubs relates to the institutional principles designed by Ostrom, and how those institutional factors impact measures of cooperation among members.

Successful buying clubs may eventually grow large enough to transition to food cooperatives, or "food co-ops." While buying clubs typically consist of informal group meetings in person or online, co-ops are physical stores which market and sell products directly to consumers while retaining some group-level attributes similar to buying clubs,

including formal membership, collective governance, and work-sharing. Co-ops possess a certain value when compared to conventional grocers, in that they are more committed to their communities, consumer preference, and support for local producers. Many co-ops play a critical role in ensuring the viability of these growers, who rely on the co-op to provide a fair price and other services. Co-ops are valued community institutions, and are key components in the strength of local food networks, along with other organizations including CSAs and farmers' markets (Katchova, 2011). Many food co-ops have been founded on the seven original co-op principles established in Rochdale, England in 1844. These principles include "open membership, democratic control, distribution of surplus in proportion to trade, payment of limited interest on capital, political and religious neutrality, cash trading and promotion of education" (Thompson, 1994). Today, the principles have been modified to include concern for community, autonomy and independence, and cooperation among cooperatives. Though these principles provide the foundation for co-ops, similar concerns play an important role in the organizational structure of buying clubs.

Buying clubs and co-ops are founded for many reasons that expand beyond economic climate to include both political and social movements. Cooperatives operating in a capitalist economy are faced with many economic disincentives, and are fueled by a number of different social and economic factors. Cooperatives generally emerge as a product of one of three phenomena: anti-corporate sentiment within a community, the perception of corporations posing a potential threat to a community, or the presence of other infrastructure within a community that supports the cooperative ideology (Boone,

2014). In general, the diffusion of corporate entities can create a reaction among community members that may support the formation of cooperatives.

Buying clubs and co-ops have appeared in two different waves in recent history. First introduced to the US mainstream market in the 1930s, co-ops offered lower-than-retail prices at a time when consumers sought exactly that. In the '30s, cooperatives diverted a significant volume of business away from traditional retailers (Taylor, 1937). World War II signaled the end of the great depression, and with it a period of dormancy for cooperatives. In the 1970's another wave of co-op interest coincided with the back to the land movement, when demand spread for natural and alternative foodstuffs. Recently, with the growing trend of organic, non-GMO and locally produced foods, co-ops are experiencing a third wave of popularity. In the US in 2014, there were between 300-350 member-owned food co-ops, providing over 850,000 jobs and $74 billion in annual wages and generating $500 billion in revenue annually (Valigra, 2014). The number of consumer food co-ops in Maine has been on the rise, which nearly doubled to 11 in 2014. Part of the reason for this trend is the increasing demand for local food seen in the growing value of crop and livestock in the state, which rose by 24% from 2007-2012, and the number of farms which increased 13.6% in this five-year period (Valigra, 2014). The increasing popularity of cooperative purchasing groups makes co-ops ripe for investigation with many new trends to be studied and analyzed. Because they are making a notable impact in Maine, they are increasingly relevant to the field of sustainable food systems.

Food co-ops generally operate at a scale much smaller than conventional retailers. Many cooperatives have modeled their business around E. F. Schumacher's concept of

"small is beautiful," which helped inspire the local food movement by arguing for a smaller-scale, more sustainable economy that suits human need without creating excessive waste. Small-scale co-ops are advantageous in many ways, and can employ strategies not feasible for other businesses, including low-cost labor in the form of volunteer programs that offer discounts, small wages or other benefits. Schumacher's "small is beautiful" principle applies well to the structure of buying clubs. However, small scale operations face the challenge of a difficult position in economies of scale. Other scholars argue that, in order for cooperatives to be successful and competitive in the long term, they must face eventual growth to compete with other businesses. Co-ops that remain averse to this growth may be disadvantaged in the event of increased competition or similar challenges in the business climate .

Cooperation in buying clubs can be revealed through the frequency of split orders – the bulk quantities items purchased with pooled funds and then split up among smaller groups within the club, as explained previously. However, cooperation can also be exhibited in other activities, such as volunteerism. Volunteer efforts are a central aspect of buying clubs and cooperatives, as many would not survive without a strong volunteer base.

Like cooperatives, buying clubs rely nearly exclusively on volunteer labor. The relationship between an organization and its volunteers is a symbiotic one, requiring attention and development over time (Hibbert, Piacentini, & Al Dajani, 2003). Asking or requiring individuals to donate their time and energy for the benefit of the group is a classic example of a social dilemma, one that is often responsible for the failure of groups. Cooperation is therefore a key factor in the ability of food buying clubs and co-

ops to successfully recruit volunteer labor and to sustain themselves. This can become a true challenge when such groups increase in size, which increases the labor requirements and reduces social returns to individuals. Thus, organizations that require unpaid labor to sustain themselves often struggle to maintain participation.

Economic game theory, a key component of this study, can be used to assess the various motivations for volunteering. While volunteerism has long been viewed as a form of unreciprocated altruism, random altruism may not be supported by evolution. Reciprocal altruism, or the expectation of some benefit in return for the generous act, may be more common in long-lived organizations. Prosociality, a set of behaviors which support group function over individual benefit, has been shown to correlate strongly with personal and organizational reward (Murnighan, Kim, & Metzger, 1993). However, other factors may influence altruism among volunteers. For example, volunteers are more likely to exhibit altruistic behaviors when they feel that the group is an important part of their identity (Meisenbach & Kramer, 2014) or if they are part of a collectivist culture in which no social contract is needed and altruism is the norm (Henrich et al., 2004). Here we addressed these elements of volunteerism in a number of questions in the buying club survey (see Appendix A).

1.3 – Economic Game Theory

We used experimental economic games to measure cooperation among the buying clubs in the study population. Experimental economic games have been identified by researchers as a useful tool for measuring prosocial behaviors, including "trust,

cooperation, and reciprocity" among people within organizations (Waring, Goff, McGuire, Moore, & Sullivan, 2014). We employ two economic experiments (or games) in this study: the dictator game and the public goods game. Although both games focus on cooperation, they are slightly different.

The dictator game provides a measure of altruism, or unenforced fairness among individuals (Camerer, 2003; Engel, 2011; Kahneman, Knetsch, & Thaler, 1986). The pure dictator game separates participants into two categories, dictators and recipients. Dictators are presented with an initial monetary endowment and asked to decide whether they wish to keep all of the endowment or donate any portion of it to an anonymous recipient. In the current study, subjects were given both dictator and recipient status. However, survey participants were not told until the end of the game that they would receive whatever portion of their endowment they wish to keep, plus whatever the previous player donated to them. If an individual chooses to act in her own self-interest, she will keep 100% of her endowment and donate zero percent to the next player. This choice provides the most immediate and guaranteed benefit, but it creates a social dilemma around unequal sharing.

Generally, donations in dictator game giving are not distributed normally, as a significant fraction of dictators choose to give nothing, and there is a large fraction at the equal split. Additionally, dictator game outcomes vary across cultures, which have different baseline levels of altruism and cooperation which affect how individuals play the game (Henrich, 2004). On average, dictators give 28% of their endowment to the other player (Engel, 2011). In higher stakes situations, their willingness to give is even further reduced. Women contribute more funds than men on average, and those of old age

were more likely to contribute all of their funds. When given a larger endowment, dictators are less likely to give nothing, but anonymity reduces participants' willingness to give (Engel, 2011). In short, dictator game behavior is largely contextual and varies within individuals, populations and between populations depending on many outside factors.

The public goods game measures the cooperative attitude of individuals toward their group (Camerer, 2003; Chaudhuri, 2011; Davis & Holt, 1993). The public goods game has a similar structure to the dictator game, with one major difference: instead of being asked to donate a portion of their funds to the next player, subjects are given the opportunity to donate to their group, after which the collective funds will grow and redistributed equally to each group member. In this study the collective fund grew by a factor of 1.4, although this multiplier varies among different studies.

Interestingly, the results of this game often deviate from the anticipated norms. The Nash equilibrium is defined as the choice which maximizes the payout to all individuals. In the public goods game, this choice is a contribution of $0 to the group. This is rooted in the assumption that others will also contribute $0, since everyone is assumed to be a payoff-maximizer. Despite this logic, experiments often yield dramatically different results, with individuals contributing a large amount or even the entirety of their endowment to the group. This behavior illustrates cooperation at the group level, when individuals believe that others in the group will also be cooperative, otherwise known as conditional cooperation (Camerer, 2003). Although acting cooperatively produces group averages, the highest payoff for individuals can be achieved by giving zero while the rest of the group acts cooperatively and donates

heavily. In game theory, this behavior is know as free-riding. This free-ridership is an important concept in Hardin and Ostrom's work, because the temptation to act selfishly is a constant threat to the equitable and sustainable management of the commons. On average, participants in public goods game experiments donate about 38% of their initial endowment to the group (Zelmer, 2003).

By implementing both experimental games, this study was able to observe cooperation at multiple levels, with the dictator game expressing individual-individual cooperation and the public goods game demonstrating individual-group cooperation. The comparison between the two games results provides some indication of how cooperative these buying clubs are on multiple levels, in relation to one another, and in relation to those outside of the study population.

Cooperation can also be measured in many other ways. Other studies have used measures of social cohesiveness of a group, or the level of connectedness that exists between members, to measure cooperation. Group identity has been assessed in surveys using Likert scales (Einolf, 2010; Heere & James, 2007; Luhtanen & Crocker, 1992), a method which was implemented in the present study of buying clubs (see question 55 in Appendix A). While group identity alone has not been found to have sufficient pull in determining cooperation, it has a much stronger effect when working in tandem with group consensus (Bouas & Komorita, 1996). The perception of consensus is a critical underlying factor in cooperation within a group, especially when the group faces a social dilemma as food buying clubs do by their very structure. Both social identity and consensus are measures observed in the current study of food buying clubs.

CHAPTER II

2.1 – Hypotheses

  This thesis is a smaller component of a larger research program funded by NSF

CAREER grant SES-1352361 to Dr. Timothy Waring. The goals of this project were to

measure cooperation, observe the prevalence of Ostrom's design principles, and to gain

an understanding of member experience in and perceptions of buying clubs. An online

survey of buying clubs was designed using Qualtrics survey software to answer some key

research questions. Table 1 includes eight different hypotheses used to develop our

survey, along with the supporting literature and corresponding questions.

  In this thesis, I address two of those hypotheses, H1 and H2. H2 is broken into

two parts, one broad and another specific.

  H1: Buying clubs and food co-ops pose social dilemmas, requiring a high level of

  cooperation and other prosocial behaviors to function.

  H2: Institutional factors and other group-level effects create stronger groups,

  which in turn create stronger group-like behavior in individuals and increased

  prosociality.

    Sub-hypothesis: Experimental measures of social capital (cooperation,

    altruism, trust), measures of participation, and successful collective action

will be greater among members of purchasing cooperatives with more

rules corresponding to the Ostrom design principles.

H1 is tested in a comparison of average buying club donations in each experimental game

(see Chapter III). H2 is tested using a quantitative analysis of measures of experimental

cooperation and prevalence of institutional design principles (see Chapter IV).

Table 1. Central hypotheses and corresponding survey questions

Hypothesis	Literature	Questions*
1. Buying clubs and food co-ops pose social dilemmas, requiring a high level of cooperation and other prosocial behaviors to function.	Ostrom (1990) Wilson (2008)	13, 16, 20, 23, 24, 26, 28, 29, 31, 50, 54, 56
2. Institutional factors and other group-level effects create stronger groups, which in turn create stronger group-like behavior in individuals and increased prosociality. Sub-hypothesis: experimental measures of social capital (cooperation, altruism, trust), measures of participation, and successful collective action will be greater among members of purchasing cooperatives with more rules corresponding to Ostrom's design principles.	Boone (2014) Anderson (2014) Engel (2011) Zelmer (2003)	10, 11, 20, 42, 50, 56
3. Prosociality can be measured by characteristics of volunteer organizations including extensivity, generativity, altruism, moral obligation, etc.	Einolf (2010) Chambré and Einolf (2008) McAdams and de St. Aubin (1992) Sawyer (1966)	43, 44, 45, 46, 47, 50
4. Being part of a group provides personal and social benefits including the formation of an identity. People may be more likely to develop altruistic behavior when they identify with the group.	Murnighan (1993) Boone (2014) Einolf (2010) (social identity theory) Heere & James (2007) Luhtanen (1992)	52, 55, 56
5. Volunteerism is a form of (weak) altruistic behavior and is essential to the structure of these organizations. Prosocial behaviors may depend on organizational or personal rewards.	Murnighan (1993) Hibbert et al. (2001)	20, 21, 42, 50, 53, 54
6. Co-ops arise from a lack of access to desired goods, anti-corporate attitudes or potential corporate threat, or the presence of infrastructure to support a co-op.	Boone (2014) Einolf (2010)	39, 41
7. Growth and expansion are necessary in order for co-ops to have lower average costs and to be competitive in economies of scale. Buying clubs can often serve as precursor groups to food co-ops. Is this an explicit goal of these clubs, or an option they've discussed?	Cotterill (1983)	33, 35, 38, 54
8. Many buying clubs receive support from co-ops in their founding, making the relationship between buying clubs and co-ops one of interplay, collaboration and evolution.	Ronco (1974)	34, 38, 49

* See Appendix A for a full list of survey questions

2.2 – Survey Design and Implementation

This survey was distributed to a population of buying clubs subscribed to Buying Club Software, Inc., an online service that helps buying clubs coordinate their orders. This service is owned and operated by Mr. Jeremy Bloom, who served as an important community partner to us during this research project. Over the course of our study, Mr. Bloom agreed to provide contact information for the buying club coordinators and helped to share our survey with the clubs. In return, the research team offered to report relevant findings to Mr. Bloom at the end of the study. To that end, the buying club survey included questions requesting users' feedback on his service. We also worked with Mr. Bloom to offer a major incentive to participants of the survey. Clubs were informed that if they were able to reach 75% of active member participation, they would receive a discount of $100 off of their subscription to Buying Club Software. Funds from the NSF CAREER grant were used to reimburse Mr. Bloom for this incentive.

The survey was distributed by an email campaign to the coordinators of eighteen buying clubs, who were informed of the project and asked to help distribute anonymous survey links to their club members (see Appendix C). Respondents were presented with a notice of informed consent before starting the survey, which explained the purpose of the study, the kinds of questions included in the survey, potential risks and benefits, compensation, confidentiality, voluntary participation, and researcher contact information (see Appendix A). These emails were later followed up with phone calls to establish a

relationship between the research team and club coordinators, boost participation and receive any feedback that coordinators or members may have wanted to share with the team. The clubs provided the necessary data for analysis and the research team will deliver key findings and relevant summary data to the clubs and to Jeremy at the end of the study.

The survey contains two different sections: one designated for buying club members and one for buying club leaders and organizers. The member section has 42 questions, including the two experimental economic games, buying club experience and participation, demographics and feedback on the quality of Buying Club Software's service. A coordinator-specific section includes 28 additional questions that address buying club logistics and organization, rules, use of the institutional design principles (IDPs) and buying club history.

2.3 – Experimental Game Methods

The survey began with the dictator game, in which respondents were presented with an endowment of $8 and given the option to anonymously donate any whole-dollar amount of that sum to another anonymous member of the respondent's buying club. The payout to respondents was calculated using the following formula:

Formula 1. Dictator game payout calculation

$$\text{Compensation} = 8 - \text{contribution to recipient} + \text{donation from dictator in game two}$$

Following one round of the dictator game, respondents were presented with one round of the public goods game. They were again provided with an $8 endowment, from which they had the option of donating any whole dollar amount to a collective fund for their buying club rather than a random individual in the club. Respondents were informed that those funds donated to the collective pool would be multiplied by 1.4 and distributed equally among all participatory members. Total individual compensation was equal to the sum of the compensation from each game.

Formula 2. Public goods game payout calculation

$$\text{Compensation} = \left[(8 - \text{contribution to group}) + \left(\frac{\sum \text{group contributions x 1.4}}{\text{number of group members}} \right) \right]$$

Following the games, participants were asked to select the option that best describes their role: buying club member or buying club leader or organizer. This is a sorting question that turned on or off the additional set of questions designed for buying club coordinators. All survey questions are provided in Appendix A.

CHAPTER III

3.1 – Summary of Results

This survey was launched on November 14th, 2016 and was open until March 1st, 2017. A total of 92 participants responded, representing nine different clubs (see Table 2). However, only seven of these clubs had high enough response rates to compare design principle implementation to member responses. The two clubs removed from this analysis provided a total of three responses, which were included in other analyses, such as those comparing experimental game outcomes.

Table 2.   Summary of Buying

Club Survey   Responses

Buying Club	Member Responses*	Coordinator Responses*
A	7	1
B	25	2
C	13	1
D	9	1
E	6	1
F	7	1
G	10	1
H	0	1
I	1	1
		Total = 92

* Includes both complete and partial responses

3.2 – Experimental Game Outcomes

Table 3. Individual club dictator game descriptive statistics (in dollars)

Club	Responses	Mean	Median	SD	Minimum	Maximum
A	8	5.00	4.00	2.83	0.00	8.00
B	27	4.74	4.00	1.91	0.00	8.00
C	14	5.21	4.00	1.93	3.00	8.00
D	10	4.60	4.00	1.35	3.00	8.00
E	7	3.86	4.00	0.90	2.00	5.00
F	8	3.88	4.00	2.17	0.00	8.00
G	11	4.91	4.00	2.01	2.00	8.00
Average	–	4.60	4.00	1.87	1.42	7.60

Table 4. Individual club public goods game descriptive statistics (in dollars)

Club	Responses	Mean	Median	SD	Minimum	Maximum
A	8	5.50	6.00	2.78	2.00	8.00
B	27	5.60	6.00	2.70	0.00	8.00
C	14	6.00	8.00	2.60	2.00	8.00
D	10	5.70	5.50	2.26	2.00	8.00
E	7	5.14	6.00	3.02	0.00	8.00
F	8	4.88	5.00	3.09	0.00	8.00
G	11	4.09	4.00	2.88	0.00	8.00
Average	–	5.27	5.71	2.76	0.06	8.00

Figure 1. Mean contributions for each game by club
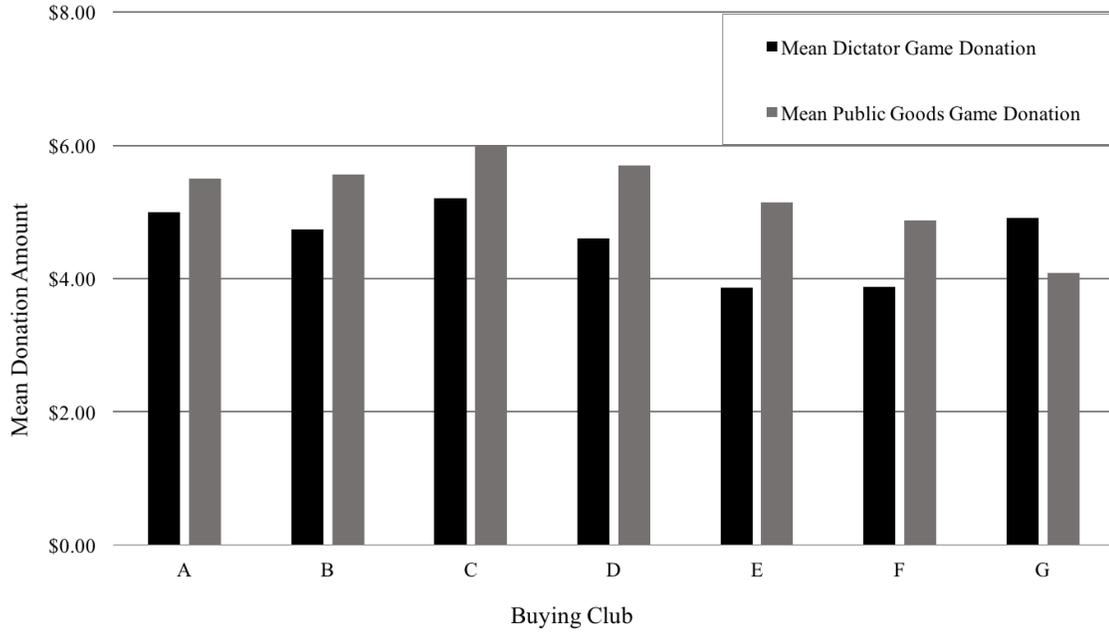
Figure 2. Average donation among groups for each game
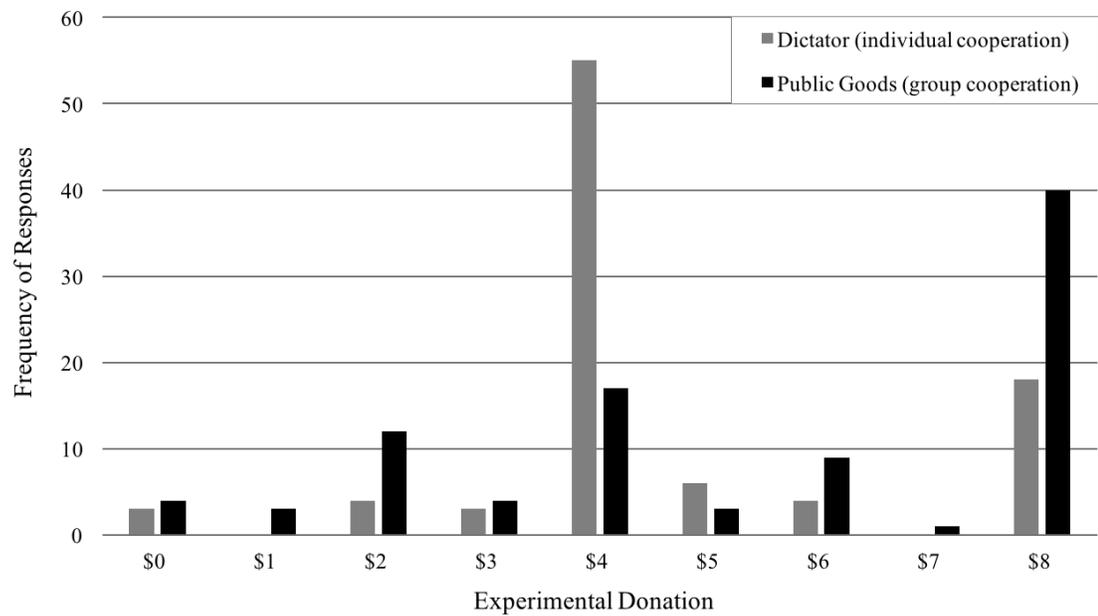
3.3 – Discussion of Experimental Game Outcomes

The mean donation for all clubs was $4.60 (58% of total endowment) for the dictator game, and $5.27 (66% of total endowment) for the public goods game. In comparing the results of these experimental games with studies conducted on other populations, it is apparent that participants in the current study donated nearly twice the typical amount. Meta-analyses of these economic games have reported a 28% mean donation for the dictator game (Engel 2011) and a 38% mean donation for the public goods game (Zelmer 2003). In comparing these figures, our data show that buying club members donated on average 107% more than the typical amount in the dictator game, and 74% more in the public goods game. This comparison suggests a greater level of cooperation among the buying club members observed at present when compared to those outside of the study population.

Buying club E donated the lowest average amount in the dictator game and is the only club that did not donate any amount greater than $5.00 in that game. This is significantly lower than the maximum donation for every other club, which was $8.00. Club E's public goods game donations are much closer to those of the rest of the study population, suggesting that members of this group are more willing or likely to cooperate with the group as a unit than with unspecified other members.

Another interesting finding displayed in Tables 3 and 4 is the increased cooperation shown by buying clubs C and D. Neither of these clubs donated less than

$2.00 or $3.00 in the dictator or public goods games, respectively, where most other groups had at least one person donate $0.00. The average donations of groups C and D are consistently high, with similar standard deviations in each of the games. Through their game choices, these buying clubs are notably similar in their cooperative behaviors.

Generally, individuals donate more on average to public goods games than to dictator games (Engel 2011; Zelmer 2003). Buying club G stands out in these data as the only group that donated a greater amount of money to the dictator game than to the public goods game (see Figure 1), which is opposite of the anticipated outcome of these experimental games and contrasts with the results of all other clubs in the current study. This finding suggests that those in club G may be more cooperative with other members directly than with the group as a unit. Future exploration of this club's survey responses may help explain this finding.

Figure 1 shows the total distribution of average donation amounts for both experimental games. As noted in Chapter I, dictator and public goods donations are generally not distributed normally. The anticipated distribution for these games shows a cluster of donations at the minimum (zero dollars), another at the median (four dollars) and one at the maximum (eight dollars). Figure 2 shows that the donations for the games in this survey are concentrated at the median and maximum amounts, with very few donations at the minimum. This may provide another suggestion that the study population observed in this research is more cooperative toward one another than the general public (Engel 2011; Zelmer 2003), which would support the broader hypothesis (*H2*) presented in Section 2.1. This and the other exploratory findings mentioned will be helpful in shaping the way the larger research project proceeds.

CHAPTER IV

4.1 – Summary of Quantitative Analysis

Ostrom's institutional design principles were derived from small communities that managed common pool natural resources such as fishing grounds and grazing pastures for livestock. The present study observes small voluntary organizations, which instead of managing a common pool natural resource, manage mutually beneficial "club goods" – the practice of collaborating to share food orders, and the social organization that supports that sharing. The following implementation of Ostrom's design principles in the survey construction and analysis further expands upon the work of scientists who have applied the Ostrom principles in nontraditional contexts.

The primary objectives of the initial exploration of the data obtained from the food buying club survey were to investigate the prevalence of Elinor Ostrom's design principles within individual food buying clubs, and the extent to which the implementation of those principles influences cooperation among members of the clubs. In order to understand the relationship, if any, between the prevalence of buying club cooperation and the implementation of the design principles, a series of index variables were constructed using a handful of relevant survey questions. Indices for six individual design principles and an overall index were then compared to measures of cooperation in four regression analyses. These equations are listed in Table 6 along with the

corresponding design principles and survey questions created to measure the prevalence of the design principles.

Elinor Ostrom produced a series of eight core design principles, as described in Chapter I of this thesis, but only the first six were implemented in this survey of food buying clubs. Principles seven and eight are less relevant to the study population at hand because they are concerned with group function as it relates to a larger system. Design principle seven, *minimal recognition of rights to organize,* ensures that individuals within groups can craft their own set of rules without facing oppressive or didactic treatment from higher authorities like government bodies. Principle eight, *nested enterprises,* is concerned with the consistent presence of the other principles at nested organizational levels and pertains more to complex and larger-scale CPRs. Given the context of this study, integration of principles seven and eight in the survey would prove difficult given the small niche market that buying clubs occupy. Additionally, the goals of this research project aligned more congruently with the first six principles, hence why they were chosen during survey design.

Here, an index was calculated to represent the prevalence of each institutional design principle for each club. The indices range from 0 to 1, and are used to compute and overall index for the total prevalence of all institutional design principles in each club. This index represents a measure of the institutional rules and factors likely to secure cooperation within each club.

Table 5. Design principle score index calculations

	Institutional Design Principle	Questions	Index Calculation
1	***Clearly defined boundaries****: Individuals or households who have rights to withdraw resource units from the CPR must be clearly defined, as must the boundaries of the CPR itself.*	23, 24	Mean
2	***Congruence between appropriation and provision rules and local conditions****: Appropriation rules restricting time, place, technology, and/or quantity of resource units are related to local conditions and to provision rules requiring labor, material and/or money.*	20, 50, 54	$\frac{\sum HC}{HR}\,\bar{S}$ HC = Total hours contributed to club HR = Total hours required by club S = Percent of satisfaction with club
3	***Collective-choice arrangements****: Most individuals affected by the operational rules can participate in modifying the operational rules.*	56	$\frac{\sum R}{3n}$ R = Response to question 56 (given assignments of 0-3)
4	***Monitors****, who actively audit CPR conditions and appropriator behavior, are accountable to the appropriators or are the appropriators.*	28	Mean
5	***Graduated sanctions****: Appropriators who violate operational rules are likely to be assessed graduated sanctions (depending on the seriousness and context of the offense) by other appropriators, by officials accountable to these appropriators, or by both.*	29	Mean
6	***Conflict-resolution mechanisms****: Appropriators and their officials have rapid access to low-cost local arenas to resolve conflicts among appropriators or between appropriators and officials.*	31	Mean

The first design principle concerns the clarity of boundaries around the common resource (in this case access to the system of shared shopping) and those who can access it. Two questions in the survey addressed this principle: Question 23 asks, "are there any

criteria required to join your buying club? Question 24 asks, "are there any requirements for staying a member of the club? To calculate the score for this design principle, the two survey responses were averaged to produce an index, as noted in Table 5.

Design principle two addresses a congruence between rules for contribution, or provision, and rules for individual benefit from group participation. Often, provision and appropriation rules within a group can be flexibly interpreted depending on the characteristics of the group. In the case of food buying clubs, provision can be defined by rules for hourly volunteer or paid contribution of work to the group, and was measured with questions 20 and 50. Individual benefit was measured with question 54. Question 20 states, "Buying clubs usually need certain tasks to be done. On average, how many hours per week does each task require?" Question 50 asks, "How many hours per week, on average, do you do work tasks for the buying club?" Finally, question 54 asks, "In general, how happy or satisfied are you with your group?

To calculate the total score for the second design principle, the sum of hours contributed to the club was divided by the total hours required, and then multiplied by the average satisfaction with the buying club. This formula captures the success of the buying club in two senses: ability to complete necessary work weighted by individual satisfaction to satisfy the congruence as described in Ostrom's second principle.

The third design principle is related to the ability of individuals to participate in group decision making. Because this principle is relatively straightforward, the survey asks a simple question that measures the amount of democratic participation that happens within each club. Question 56 asks, "As a member of this buying club, do you feel as though you have a say in all decisions being made?" The options for this question, with a

score of 0-3 assigned to each, are as follows: I don't have any say (0), I have some say but not as much as others (1), I have equal say in what happens on some matters (2), and I have I have equal say in what happens on all matters (3). To calculate the overall score for this principle, the sum of these assignments was divided by the number of responses times three, which is the maximum score for each response. This formula provided a score ranging from 0-1 for each club.

Design principle four is concerned with monitoring individual behavior within groups to ensure that members are held accountable for their actions that affect the CPR. In other words, it is a way to determine if the rules of the group need to be enforced. The coordinator survey contains one question that addresses this principle. Question 28 asks, "Does your club have a system for monitoring behavior among members? Options are yes or no, with a text box to describe any particular monitoring methods. To calculate the score, clubs were either given a 0 or 1, with 0 indicating no use of a monitoring system and 1 indicating the presence or use of such a system. In the present study, none of the clubs used a system to monitor member actions, so we have excluded this variable from the regressions.

The fifth principle is also concerned with rule enforcement, but is more focused on disciplinary action. The survey includes design principle five in question 29 of the coordinator survey, which asks, "Are there consequences for breaking these rules?" as a follow-up to question 28 described above. The options for question 29 are yes or no, and the score for this principle was calculated in the same manner as design principle four, with 0 indicating no consequences, and 1 indicating the presence or implementation or consequences for rule-breaking.

The sixth and final design principle included in this survey is concerned with group ability to resolve conflicts in a productive and beneficial way. Question 31 of the coordinator survey asks, "Does the buying club have a standardized method for resolving conflicts?" The options for response are yes or no, and the score for this principle was calculated in the same manner as principles four and five, with 0 indicating no standard method and 1 indicating the presence or use of a conflict-resolution method. Because no clubs had a score of 1, we excluded this IDP from the analysis.

To calculate the total, aggregated score for each club, a simple average of all of the individual scores was taken (see Table 6).

Table 6. Calculated design principle scores of individual clubs

Club	IDP 1	IDP 2	IDP 3	IDP 5	Total IDP Score
A	0	0.9	0.57	0	0.25
B	1	0.66	0.64	0	0.38
C	0.5	0.32	0.62	0	0.24
D	0	0.85	0.83	0	0.20
E	0.5	0.24	0.88	0	0.27
F	1	0.32	0.57	1	0.40
G	0	0.27	0.71	0	0.16

Average score: 0.29

4.2 – Statistical Analyses

These data were analyzed using two statistical methods. First, a series of means tests cross-examining the average donation amounts of each group for the two experimental games were conducted. Though these data are discrete, the use of means tests, especially with ordinal data, is common (De Winter & Dodou 2010). Because these data are not normally distributed, we used a non-parametric Mann-Whitney Wilcoxon

Test. The purpose of these means tests was to observe any significant difference between donations across groups. The means tests did not yield any significant difference between group donations, as shown in Appendix D.

The second method of statistical analysis implemented was a multi-level regression. Four versions of the regression were computed to examine both the dictator and public goods game donations and measuring those outcomes against the use of the Ostrom design principles within groups, while constituting for demographics. For each of the two games, the regressions observed both aggregated IDP scores (see Table 6) in relation to the game contributions, and individual IDP scores (indices shown in Table 5) in relation to game contributions. We model individual dictator game responses as a function of group level characteristics related to IDPs and individual characteristics. The results of these regressions are listed in Table 7.

Formula 3. Regression formula

$$D_{ij} = \alpha + \eta' \text{IDP}_{j} + \beta' \text{X}_{i} + \epsilon_{i}$$

Table 7. Estimated coefficients (in dollars)

Estimates	Dictator Game		Public Goods Game	
	IDP Total	IDP Individual	IDP Total	IDP Individual
IDP Score	-1.746553	–	3.341762	–
IDP 1	–	0.09	–	0.91
IDP 2	–	0.09	–	0.21
IDP 3	–	-2.07	–	1.46
IDP 5	–	-2.52**	–	-0.18
Age	-0.04*	-0.03'	-0.05*	-0.05'
Income	0.02**	0.02**	0.005	0.01
# of dependents	-0.27	-0.02	0.10	0.10
R-squared	0.14	0.20	0.05	0.01
F	3.67	3.47	1.96	1.15
p-value	0.01'	0.003*	0.11	0.35

**p < 0.01, *p < 0.05, 'p < 0.1

4.3 – Discussion of Quantitative Analysis Results

As shown in Table 7, the only significant predictors of dictator game donations are IDP 5, age, and household income. Interestingly, the existence of design principle 5 (graduated sanctions) is negatively associated with dictator game contributions. This is an unanticipated outcome, seemingly contradicting hypothesis *H2*. However, the effect for IDP 5 relies on a single coordinator answering a single yes answer on question 29. While this could be a truthful answer and real effect we are observing, this finding can only be supported with low certainty due to its reliance on a single data point.

Age was negatively associated with donations in both economic games, showing some level of significance in each regression. This runs counter to the expected positive effect (Engel 2011). Income was positively associated with donations in the dictator

game, which also runs counter to the expected negative relationship (Piff, Kraus, Côté, Cheng, & Keltner, 2010).

The models developed for the dictator game were significant at both the total and individual levels, as indicated by the respective p-values of 0.01 and 0.003. The models for the public goods game were not significant enough to express the relationship between the IDP scores and game donations, which is evident in their p-values. There are many potential reasons for the inadequacy of these models. The paucity of data gathered by the present study must be taken into account, which has almost certainly yielded some unanticipated results. There were only seven individual clubs with a total of nine coordinators and 76 members surveyed. In addition, there may be better ways to specify the model given these data.

If the methods of analysis used in this study measured the IDPs accurately, the data observed at present do not suggest that the use of design principles in the food buying clubs surveyed has any significant impact on the strength of individual or group cooperation as measured by the experimental economic games. While it is entirely possible that the extent to which buying clubs utilize the principles is not significant enough to impact the cooperation of individuals or groups, as the data suggest, it would be difficult to determine without a larger study population and more accurate models to observe the potential relationship between design principle implementation and experimental measures of cooperation.

CHAPTER V

5.1 – Conclusions

This study found average dictator game contributions from the participating buying clubs to be nearly double that of average contributions from groups in other contexts, with 58% found in this study compared to Engel's 28% (2011). The average public goods game donation found in this study was 66% of total endowment, which is nearly double that of typical donations of 38% found in other studies (Zelmer 2003). This comparison suggests elevated levels of cooperation among buying club participants when compared to other study populations, and provides support for H1. Scant support for H2 was found, with the significance of one design principle's influence on cooperation resting on a single data point. Age was associated negatively with giving in both games, and household income was associated positively with dictator contributions but had no effect on public goods game donations. Mean contributions for both experimental games greatly exceeded those observed in other study populations.

5.2 – Next Steps

The major goal of this thesis is to provide a preliminary, exploratory analysis of survey data generated by the ongoing study of food buying clubs, which is one component of a larger study of cooperation in the local food industry. Thus, recommendations for next steps are key deliverables of this project. The next step in

unpacking all of the data generated by the buying club survey is to summarize and

interpret the remaining quantitative questions. Many of these transcend the scope of this

thesis, and pertain to other hypotheses formulated in the study framework (see Table 1).

Additionally, an assessment of the qualitative data needs to be generated. Coordinators

who filled out the survey have provided some more detailed and lengthy responses that

should be compiled and analyzed. Once the results unaddressed by this thesis are

compiled and analyzed, a summary of meaningful findings should be crafted and

 distributed to interested parties including the buying clubs that have participated in the

study as well as Mr. Jeremy Bloom. The summarizing and reporting of key findings

pertaining to these groups and Mr. Bloom is an important aspect of this

stakeholder-driven research and is a top priority for the team following this exploratory

study.

Next, a reassessment of the role of institutional factors including the IDPs should

take place, using the new findings to help refine the metrics used. Once the formulas have

been improved upon, the models developed for the public goods game should be revised,

as they were not identified as significant models of in the statistical analysis (see Table

7).

Beyond the regression results, this study has identified a number of interesting

paths to be taken by further investigation. There are many ways to study cooperation

among groups with these data – comparing design principle scores to experimental game

donations is only one. There are some interesting findings discussed in Section 3.3 that

point to similarities and differences between groups, outliers and general trends in the

data that could be more comprehensively analyzed. Some key questions for future

investigation include:

1) Why did buying club E have the smallest donation average for the dictator game, but typical donations for the public goods game? What characteristics make this club stand out from the others in the study?
2) Why do buying clubs C and D seem to be more cooperative than the rest? Are there other similarities that these clubs possess that make them unique from the study population?
3) Why does buying club G have a higher average donation to the dictator game than the public goods game? Do the club's survey results express lower cooperation at the group level?

Aside from these points, more investigation should be done which looks at

volunteering to understand cooperation, reciprocity and weak altruism. A number of

questions in the survey address this connection (see Table 1, *H5*). Understanding

cooperation in terms of time committed to the club and perceived personal reward.

Finally, more data would certainly enhance the findings of this research. The paucity of

data available for analysis in this preliminary stage of research makes it difficult to truly

understand what is happening in these clubs, but nonetheless provide some valuable

insight that will help improve the next stages of research. Another round of survey

distribution to more food buying clubs would allow the research team to dive deeper into

the connection between Ostrom's design principles and institutional cooperation. This

Honors thesis has truly only scratched the surface.

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Appendix A – Buying Club Survey

Buying Club Software Survey

Welcome to the Buying Club Survey

Thank you giving your time to fill out this survey.

The Food Club Project is a collaborative research group. We are searching for the best solutions to the challenges that food buying clubs face. Your responses will help us identify those solutions. We will share the survey results with you as soon as possible. We hope that the findings will help your group in some new and interesting ways. After a required University research statement, the survey proceeds as follows.

Two paid economic games (2 min) Buying club experiences (10 min) Demographic information (3 min) We also have a special section for buying club coordinators (10 min). All together, it should take between 15 and 25 minutes. We look forward to your input!

   - The Food Club Project team

University of Maine Notice of Informed Consent
You are invited to participate in a research project lead by professor Tim Waring and student researchers at the University of Maine. The project is a study of the challenges faced by food buying clubs, and the solutions that groups have discovered. You must be at least 18 years of age to participate.

What Will You Be Asked to Do?
You will be asked to play two economic games with real money provided by the researcher, some of which you will get to keep. You will also be asked to complete a survey about your experience with your food buying club. In total this should take 15 to 30 minutes.

Risks: The only risks to participating in this experiment are the time and inconvenience of participation.

Compensation: The economic games provide monetary compensation ranging from $0 to $35, depending on your choices in the game.

Confidentiality: Your responses will be treated confidentially, and will be encrypted for security. You will be anonymous to other players in the economic games. You will be asked to select your club ID from a list, and provide your email address so that we can compensate you. Email addresses, club IDs and personal identifying information will never be published, presented, or shared outside of the research team. Identifying information will be destroyed at the end of the project (~5 years). Summary data (key findings, trends, themes etc.) will be shared with Jeremy Bloom, and buying club participants, but no raw data will be shared.

Benefits: There are no direct benefits to you. The research will benefit society by improving our understanding of food buying clubs and cooperation.

Voluntary: Participation is voluntary. You may stop at any time. However, if you stop before the end of the survey we will not be able to calculate your payment, or pay you.

Contact: If you have any questions about the research or its goals, please contact Afton Hupper at afton.hupper@maine.edu or (207) 691-1786 or Ethan Tremblay at ethan.tremblay@maine.edu or (207) 299-4975, or Dr. Waring at timothy.waring@maine.edu. Any questions about your rights as a participant may be directed to Gayle Jones, Assistant to the University of Maine's Protection of Human Subjects, Institutional Review Board (IRB), at gayle.jones@umit.maine.edu or by phone: (207) 581-1498.

By continuing you signal that you understand the risks and benefits and agree to participate.

Economic Games

• First you will play two separate economic games.
• Your identity and responses will be completely confidential.
• You will be anonymous to other players, and they will be anonymous to you.

First Game

You are playing with: another person in your buying club.
     1. You have an endowment of $8.
     2. You may choose to contribute any whole-dollar amount ($0 to $8) to the other player.
     3. You will be paid the amount you chose to keep.
     4. The other player will be paid the amount you chose to contribute to them.

Q 10 Use the slider to indicate how much, if any, you will contribute to another person in your buying club.
_____ Dollars contributed

Second Game

You are playing with the all other members of your buying club.
   1. You have an endowment of $8.
   2. You may choose to contribute any whole-dollar amount ($0 to $8) to a group
   fund.
   3. Every other player may choose to contribute to the group fund.
   4. The group fund will grow by 40%, then be divided equally between every
   member of the group, regardless of their individual contributions.
   5. You will be paid the amount you kept, plus your equal share of the final group
   fund.
   6. Every other player faces the same scenario as you.

Q 11 Use the slider to indicate how much, if any, you contribute to your buying club's
group fund. Remember, the group fund will be increased 40% and divided evenly
between all members.
_____ Dollars contributed

Thank you. Your choices have been recorded. We will calculate your payment once all
responses are recorded. To make payment possible, you will be asked to provide your
email address at the end of the survey. If you fail to complete the survey and provide a
correct email address, we will be unable to pay you.   Next, we ask a series of questions
on your experience with your buying club.

Q 12 Which best describes your role in the buying club?
❍   Member (participates in buying club orders)
❍   Coordinator (facilitates or coordinates buying club business)

Coordinators Section

As a buying club coordinator, you have responsibilities and perspectives beyond those of
an individual member. This section concerns your role and experiences as a coordinator,
and has questions about the ordering process, club organization, and history.

Ordering Process – we will start with how the buying club makes orders.

Q 13 Has your buying club had problems with people not contributing to group work as
they should, or people breaking the rules?
❍   Yes
❍   No

Q 14 How frequently does your club usually place orders? Please enter the number of
days between orders.

Q 15 How many people typically participate in an order?

Q 16 About what percentage of purchases are typically shared among members?
_____ Percent of purchases shared

Q 17 What amount of shared ordering would be best for the group?
- ❍ More shared orders
- ❍ The current amount
- ❍ Fewer shared orders
- ❍ Not sure

Organization and Operation – please consider how your buying club operates.

Q18 How does your club communicate? Select all that apply.
- ❑ Email
- ❑ Phone
- ❑ Texting
- ❑ Facebook
- ❑ Other _____

Q 19 Your group uses Buying Club Software to organize orders. What other tools do you use to organize your orders? Select all that apply.
- ❑ Paper order lists
- ❑ Offline spreadsheets (like Microsoft Excel)
- ❑ Online spreadsheets (like Google Sheets)
- ❑ Financial software (like Quicken, Quickbooks)
- ❑ Other (please describe) _____

Q 20 Buying clubs usually need certain tasks to be done. On average, how many hours per week does each task require?
_____ Compiling and Submitting orders (a)
_____ Financial Bookkeeping (b)
_____ Communication & Member Management ©
_____ Hosting deliveries (d)
_____ Hosting meetings (e)
_____ Contacting wholesalers (f)
_____ Task A (g)
_____ Task B (h)
_____ Task C (i)

Q 21 How do members share work tasks? If the coordinator shares the task with other members, indicate the total number of people sharing the task.

_____ Compiling and Submitting orders (a)
_____ Financial Bookkeeping (b)
_____ Communication & Member Management (c)
_____ Hosting deliveries (d)
_____ Hosting meetings (e)
_____ Contacting wholesalers (f)
_____ Task A (g)
_____ Task B (h)
_____ Task C (i)

Q 22 Are any roles or tasks in the club compensated? If so, please explain which tasks or roles are compensated, and how.

Q 23 Are there any criteria required to join your buying club?
❍   No
❍   Yes ---> Please list criteria to join: _____

Q 24 Are there any requirements for staying a member of the club?
❍   No
❍   Yes ---> Please list membership requirements: _____

Q 25 Please list the three most important group decisions the buying club makes. For example, these might concern suppliers, scheduling, group work, changing rules, or other topics.
Group Decision #1
Group Decision #2
Group Decision #3

Q 26 How does the group make these important group decisions?
❍   Leader / coordinator decides
❍   Informal discussion
❍   Vote (majority rule)
❍   Consensus (action requires unanimity)
❍   Other _____

Q 27 Please describe the three most important rules (guidelines or expectations) your group has.
        Rule 1 (a)
        Rule 2 (b)
        Rule 3 (c)

Q 28 Does your club have a system for monitoring behavior among members?
○   No
○   Yes ---> Please summarize monitoring system: _____

Q 29 Are there consequences for breaking these rules?
○   No
○   Yes ---> Please list consequences: _____

Q 30 How often do conflicts between members arise?
_____ Frequency of conflicts

Q 31 Does the buying club have a standardized method for resolving conflicts?
○   No (2)
○   Yes ---> Please summarize method for resolving conflicts:

_____

 Buying Club History – please tell us a little about how your buying club began, and how it has changed.

Q 32 What year was your buying club was established?

Q 33 When your buying club began, how many members did it have?

Q 34 What resources were helpful in organizing the group initially? Check all that apply.
❑   Experienced members (1)
❑   Advice from non-members (2)
❑   Written guidelines, advice or principles (3)
❑   Other: (4) _____

Q 35 By how many many members has your buying club grown since it started? If your group has shrunk, use negative numbers.

Q 36 Please comment on how your buying club has changed over time.
order & delivery schedule (a)
food preferences (b)
shared purchases (c)
division of work tasks (d)
goals and motivations (e)
group identity (f)

Q 37 What has been your group's biggest challenge?

Q 38 What goals or plans does the group have for the future?

Members Section – this section concerns your experiences as a buying club member.

Ordering Practices – please consider your ordering practices.

Q 39 What are your primary motivations for joining your buying club? Select all that apply.
❑ To save money on food
❑ To gain access to certain foods
❑ To meet health and dietary preferences
❑ To support local producers
❑ To support good environmental practices
❑ To support good social practices
❑ To avoid industrialized food
❑ To socialize with club members
❑ Due to familiarity with buying clubs
❑ Due to personal connection or invitation
❑ Other _____
❑ Other _____
❑ Other _____

Q 40 How often do you place an order with your buying club?
_____ Weeks

Q 41 What percent of your total household needs are met through your buying club?
_____ % of needs met

Q 42 People in buying clubs often split big, bulk purchases. Considering these split purchases:
_____ How often do you split a purchase to help someone else? (a)
_____ How often do other people split a purchase to help you? (b)

Food Preferences – this section concerns how your buying club fulfills your food preferences.

Q 43 Please select the types of foods that you purchase through the buying club. (Select all that apply)

- ❑ organic (a)
- ❑ fair trade (b)
- ❑ non-GMO (c)
- ❑ sustainably sourced (d)
- ❑ rare, ethnic or specialty foods (e)
- ❑ local food (f)
- ❑ other (g) _____
- ❑ other (h) _____

Q 44 What percentage of the items you purchase are sourced locally?
_____ % of local

Q 45 What percent of items you purchase are organic, fair trade, or sustainably sourced?
_____ % organic, fair trade, sustainable

Q 46 How expensive are these organic, fair trade, or sustainably sourced items compared to conventional items?

	Much less expensive (1)	Less expensive (2)	About the same (3)	More expensive (4)	Much more expensive (5)
Relative cost (1)	○	○	○	○	○

Q 47 If you purchase organic, fair trade, or sustainably sourced items, please explain your personal reasons.

Q 48 Have your food preferences or habits changed due to your experience in the buying club? Please explain.

Participation – this section focuses on your participation in the buying club.

Q 49 Please consider your connections to other buying clubs, food coops, or related groups. (Select all that apply.)

- ❑ Do you have personal experience with a similar group (e.g. buying club, food coop, etc.)? (a)
- ❑ Did you learn from someone with experience in a similar group? (b)

Q 50 How many hours per week, on average, do you do work tasks for the buying club? (Work tasks might include hosting deliveries, financial bookkeeping, etc.)

Q 51 What work tasks have you done, and what roles have you occupied in the buying club?

Q 52 Please rank the accuracy of the following statements in terms of how your group functions.
_____ My group communicates well. (a)
_____ Members contribute a fair share of the work. (b)
_____ Each member benefits equally from participating in the group. (c)
_____ Group members share purchases when needed. (d)
_____ My group functions well overall. (e)

Q 53 Please reflect on the various costs and benefits of participating in the buying club. Participating...
_____ ... benefits me financially. (a)
_____ ... costs me financially. (b)
_____ ... benefits me socially. (c)
_____ ... costs me   socially. (d)
_____ OVERALL: Participation benefits outweigh costs. (e)

Q 54 In general, how happy or satisfied are you with your group?
_____ Level of satisfaction

Q 55 Please rank the accuracy of the following statements in terms of your buying club.
_____ I have a strong sense of belonging to the buying club. (a)
_____ When I talk about the buying club, I usually say "we" rather than "they." (b)
_____ When someone praises the buying club, it feels like a personal compliment. (c)
_____ What happens to the buying club will have an impact on my own life. (d)
_____ The needs and wants of other members of the buying club influence my needs and wants. (e)
_____ The buying club requires effort from all members to function. (f)
_____ I interact with other buying club members frequently. (g)
_____ Being a member of the buying club is a major factor in my social relationships. (h)
_____ I am active in other organizations that include mostly members of the buying club. (i)

Q 56 As a member of this buying club, do you feel as though you have a say in all decisions being made? (i.e. changes in suppliers, goals, rules, etc.)
❍   Yes, I have an equal say in what happens on ALL matters (a)
❍   Yes, I have an equal say on SOME matters (b)
❍   Yes, I have some say but not as much as others (c)
❍   No, I don't have any say (d)

Q 57 Is there anything you wish your group could do better? Please be specific. For example, communication, shared purchases, members, hours contributed, organization, etc.

Demographic Information – the basic information provided in this section will be kept strictly confidential.

Q 58 Please select your age.
- ❍ 18
- ❍ 19
- ❍ …up to 100

Q 59 What is your gender?
- ❍ Male
- ❍ Female
- ❍ Prefer not to say

Q 60 Please describe your ethnicity by selecting all that apply.
- ❑ White
- ❑ Black or African American
- ❑ Latino / Latina
- ❑ American Indian or Alaska Native
- ❑ Asian
- ❑ Native Hawaiian or Pacific Islander
- ❑ Prefer not to say
- ❑ Other

Q 61 Please select your highest completed education level.
- ❍ Some high school
- ❍ High school diploma or GED
- ❍ Some college or an associate's degree
- ❍ Bachelor's degree
- ❍ Master's or professional degree
- ❍ PhD, JD, MD, etc.

Q 62 What is your approximate annual household income?
_____ Approximate annual household income (in thousands)

Q 63 Please select your employment status.
- ❍ Employed full time
- ❍ Employed part time
- ❍ Unemployed looking for work
- ❍ Unemployed not looking for work
- ❍ Self-employed/work from home
- ❍ Homemaker
- ❍ Retired
- ❍ Student
- ❍ Disabled

Q 64 How many people are in your household?

Q 65 How many earners are in your household?

Q 66 How many dependents are in your household?

Buying Club Software

Please consider how your group uses BuyingClubSoftware.com to organize shared orders. Your responses here will help improve BuyingClubSoftware.

Q 67 How satisfied are you with the service provided by BuyingClubSoftware?
_____ Satisfaction

Q 68 How could BuyingClubSoftware improve its service?

Q 69 What do you appreciate about BuyingClubSoftware now?

Q 70 Payment Details

One last step... electronic payment! We use a free service called Square Cash to send your games payments electronically.

Square Cash Details:
- Square Cash is secure, fast, and will deposit the payment into your bank account.
- You will need a current debit card to accept the payment.
- You will receive an email from cash@square.com, with a link to accept the payment.
- You will have 14 days to accept the payment.
- The deposit will appear on your bank statement as "SQC*WARING" or "SQ*WARING". Please enter your email address below so we can send you your payment:

You're all done!

Thank you.

Your answers will help us better understand the best solutions buying clubs have found to their hardest challenges. Once everyone has been able to complete the survey and games, and we have analyzed them all, we will share the survey results with you and your club. We hope that the findings will be interesting and useful!

Don't Forget:

Look for an email from cash@square.com with instructions to accept your games payment!

 - The Food Club Project Team

Appendix B – Institutional Review Board Approval of research with human subjects

MEMORANDUM

TO: Timothy Waring
                200 Winslow Hall

FROM: Gayle Jones
                Assistant to the Institutional Review Board for the Protection of Human
                Subjects (IRB)

SUBJECT: "Investigating the Role of Cooperation Among Food Buying Clubs and
                Cooperatives," #2016-08-09

DATE: October 26, 2016

        The above referenced project was approved by the University of Maine's
Institutional Review Board for the Protection of Human Subjects (IRB) in an expedited
review. The approval period is 10/25/2016 through 10/24/2017. A continuing review of
this project must be conducted by the IRB before the end of the approval period.
Although you will receive a request for this information approximately 6-8 weeks before
that date, it is your responsibility to submit the information in sufficient time to allow for
review before the approval period expires.

        Attached is an approved copy of the consent document for this project. The
approval for this consent expires on 10/24/2017. **Please be sure the approval
information found on the bottom is added to the version you post.** The Board waived
the requirement for signed consent under Section I.K.3.b. of the Policy.

        Please remember that any proposed changes to the research must be approved by
the IRB **prior** to implementation. If you have questions, please contact me at 1-1498.
Thank you.

Appendix C – Emails to Buying Clubs

1. Launch Email

SUBJECT: The Buying Club Survey

Dear COORDINATOR,

I am an honors student working on the **Food Club Project** with professor Tim Waring at the University of Maine and Jeremy Bloom of BuyingClubSoftware.com. Over the past several months we have carefully designed a survey to discover the practices that make buying clubs most successful. Your feedback in this survey will help us identify those solutions and practices. We will share the survey results with you as soon as possible, and we are hopeful that they will help your group in some concrete and interesting ways.

The survey includes two paid economic experiments and will take only 15 - 30 minutes. **Could you please help make sure everyone in your group takes the survey?**

Here is the link:
The Buying Club Survey: Group Name

Thank you so much!

If you would like to learn more about the Food Club Project, please feel free to contact me at **afton.hupper@maine.edu**, by phone (207-691-1786), or visit our **website**. Sincerely,

Afton Hupper
Honors Student, Sustainable Food Systems

And the rest of the team….
  Jeremy Bloom (BuyingClubSoftware.com)
  Tim Waring (Associate Professor, University of Maine)
  Ethan Tremblay (Masters Student, Economics)
  Taylor Lange (PhD Student, Environmental Science)

2. Reminder Email

SUBJECT: Happy New Year from the Food Club Project!

Dear COORDINATOR,

Happy new year to CLUB NAME from the Food Club Project at UMaine. We study buying clubs, and our survey helps clubs learn what makes them unique, and makes it easy to learn from other clubs.

Thank you!
Thanks for distributing the survey to CLUB NAME buying club. The responses so far hint at some interesting results we look forward to sharing with you. But, so far, only PERCENT% of your club has completed the survey - not enough for clear conclusions. The more people complete it, the stronger the results will be. So, we are opening the survey again for one month in 2017. Can you please help encourage everyone in your group to complete the survey? Here's the link:

[CLUB SURVEY LINK]
Survey link for [CLUB] members & coordinators only.

As a reminder, the survey:

- **Is built to help buying clubs**. We share our results with clubs that take the survey.
- **Includes a paid economic game**. Payments up to $35, depending on your choices.
- **Is short.** Although comprehensive, the survey takes only 15 to 25 min.
- **Is good for your club.** If 75% of your club finishes the survey, you get $100 off BuyingClubSoftware.com.
- **Is confidential.** We are a non-profit, grant-funded research team. We don't share any of your personal information with third parties.

Please let us know if you have any problems or questions! We are here to help, and we would be happy to chat, and answer any questions.

Again, thank you, and happy 2017!

Sincerely,

Afton Hupper (Honors Student, University of Maine)
And the Food Club Project Research Team
afton.hupper@maine.edu
(207) 691-1786

Appendix D – Means Tests

Table 8. Differences in mean dictator game donations between groups (in dollars)

Club	A	B	C	D	E	F	G
A	–	–	–	–	–	–	–
B	0.26	–	–	–	–	–	–
C	0.21	0.47	–	–	–	–	–
D	0.40	0.14	0.61	–	–	–	–
E	1.15	0.89	1.36	0.75	–	–	–
F	1.13	0.87	1.34	0.73	0.02	–	–
G	0.10	0.16	0.31	0.30	1.05	1.03	–

Table 9. Differences in mean public goods game donations between groups (in dollars)

Club	A	B	C	D	E	F	G
A	–	–	–	–	–	–	–
B	0.05	–	–	–	–	–	–
C	0.50	0.44	–	–	–	–	–
D	0.20	0.14	.30	–	–	–	–
E	0.36	0.41	.85	.56	–	–	–
F	0.63	0.68	1.13	.83	.27	–	–
G	1.41	1.46	1.91	1.61	1.05	.78	–

AUTHOR'S BIOGRAPHY

Afton Hupper was born September 20, 1995 and raised in St. George Maine. She graduated from Oceanside High School in 2013, and completed her Bachelor of Science in Ecology and Environmental Sciences with a concentration in Sustainability, Environmental Policy and Natural Resource management and minor in Sustainable Food Systems at the University of Maine in 2017. During her undergraduate career, Afton held a number of internships and research positions pertaining to sustainable food systems including those with the Honors College, the Orono Economic Development Corporation, the Good Shepherd Food Bank of Maine, the Anthropology Department and the School of Economics. After graduating, Afton looks forward to completing a Master of Science in Resource Economics and Policy at the University of Maine.