Conditional Cooperation and Cultural Worldviews

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1. Introduction

Contributions to public goods are often found to be conditional on the willingness of others to contribute. While psychologists have long recognized the existence of conditional cooperation (Kelley and Stahelski 1970), the topic re-emerged as a prominent line of inquiry among economists decades later (e.g., Croson 1996; Keser and van Winden 2000). Findings from lab and field experiments suggest that most people condition their own contributions on others' contributions (e.g., Fischbacher et al. 2001; Fischbacher and Gächter 2010), with such behavior even being prevalent at an early age (Lergetporer et al. 2014).

However, the literature reports that conditional cooperation is not universal, with some people exhibiting pure free-riding behavior—i.e., they remain non-contributors regardless of other people's actions (e.g., Fischbacher and Gächter 2010). The mix of different types of behavior is important because a minority of free-riders is often enough to deter the conditional cooperation of others (Ambrus and Pathak 2011). Previous research reports the distinction between free-riders and conditional cooperators varies systematically across populations in different countries (e.g., Kocher et al. 2008; Herrmann et al. 2008; Martinsson et al. 2013) and across people of different social classes (Martinsson et al. 2015).

We extend this line of inquiry by exploring whether conditional cooperation varies systematically across individual cultural worldviews. Rather than categorizing individuals by geographic location or by social class, we draw from the literature to measure cultural worldviews at the individual level. Combined with standard laboratory methods to measure

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individual conditional cooperation, we examine how cultural worldviews explain conditional

cooperation. Findings corroborate previous reports that conditional cooperative behavior is not

universal and extend the literature by showing conditional cooperation and pure free-riding

behavior is strongly associated with specific worldviews.

2. Experimental Design

Conditional cooperation. Our experimental design uses the strategy method introduced by

Fischbacher et al. (2001) and adopted by many others (e.g., Kocher et al. 2008; Martinsson et al.

2013). Subjects (*n*=201) were drawn from the Amazon Mechanical Turk (MTurk) workforce.[1]

Table 1 reports the sample distributions of education, income, gender and age. Subjects were

endowed with 20 tokens and placed in groups of four. Subjects could keep their tokens or invest

them in a group project with a marginal per capital return (MPCR) of 0.40 tokens.

Subjects made two types of decisions. The *unconditional contribution* decision was how

many of the 20 tokens to contribute to the public project independent of the decisions made by

the other three members. The *conditional contribution* decision was how many of the 20 tokens

to contribute given the average contribution of the other three members. Either the unconditional

contribution or the conditional contribution would be binding but the subject would not know

which one until after all decisions were made. After all decisions were submitted, one group

member would be randomly chosen to have their conditional contribution decision be binding,

with the other three members having their unconditional contribution be binding. Subjects'

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[1] Participation was restricted to U.S. residents with a 95% or higher grade on MTurk. Studies report that MTurk
subject behavior can be reliable (e.g., Mason and Suri 2012), and MTurk samples are more representative than
typical in-person convenience samples, such as university students (Berinsky et al. 2012). Moreover, experimental
studies that use MTurk subjects report findings consistent with the literature, including Prisoner's Dilemma and
public good games (e.g., Horton et al. 2011).

earnings were determined and paid using an exchange rate of 10 tokens = $1 (USD). Including a fixed participation payment of $1.25, subjects earned on average $3.60. This translates to $14.40 hourly earnings considering the task took an average of 15 minutes to complete.

Cultural worldviews. Following the seminal work of Douglas and Wildavsky (1982), we define cultural worldview as the socially constructed orientation that dictates how one interprets and interacts with reality. This concept of worldviews has been the impetus for an emerging literature that has documented their importance in individual preferences about social issues and conflicts, including climate change (Kahan et al. 2011), gun control (Kahan et al. 2009) and low-carbon energy (Cherry et al. 2014).

Following this literature, we employ the (short-form) cultural worldview questionnaire from Kahan et al. (2011), which is used to measure an individual's cultural worldview across two dimensions. The *hierarchy-egalitarianism* dimension relates to "attitudes toward social orderings that connect authority to stratified social roles based on highly conspicuous and largely fixed characteristics such as gender, race, and class" (p. 51, Kahan et al. 2011). The *individualism-communitarianism* dimension relates to "attitudes toward social orderings that expect individuals to secure their own well-being without assistance or interference from society versus those that assign society the obligation to secure collective welfare and the power to override competing individual interests" (p. 51, Kahan et al. 2011).

For each worldview dimension, the questionnaire presents four statements that capture the worldview predispositions. Subjects use a five-level Likert scale to indicate the extent to which they agree with each of the statements, which is translated to a score of 1 to 5 (1=strongly disagree to 5=strongly agree). The sum of scores for the four hierarchy statements places the individual's views along the hierarchy-egalitarianism spectrum, while the sum of scores for the

individualism statements focus on the individualism-communitarianism dimensions. The two worldview measures, hierarchy and individualism, will provide the basis for examining the influence of cultural worldviews on conditional cooperation.

Table 1. Sample Demographics

Education		Income (thousands)		Gender		Age	
< High School	1%	$x < \$15$	10%	Male	57%	18 to 30	52%
High School	10%	$\$15 \leq x < 25$	18%	Female	43%	31 to 48	39%
Some college	27%	$\$25 \leq x < 50$	31%			49 to 67	9%
2 year degree	8%	$\$50 \leq x < 75$	24%				
Bachelors Degree	43%	$\$75 \leq x < 100$	9%				
Graduate Degree	9%	$\$100 \leq x < 125$	6%				
		$\$125 \leq x$	2%				

3. Results

Cultural worldviews. To examine how worldviews explain conditional cooperation, we assign subjects to worldview categories based on their scores. The two worldview scores range from 4 to 20, with higher scores in the individualism measure indicating more individualistic (less communitarian) worldviews and higher scores in the hierarchy measure indicating more hierarchical (less egalitarian) worldviews.[2] Subjects that scored above the median of the individualism measure are defined as individualistic types, while those that scored at or below the median are classified as communitarian types. Similarly, subjects with scores above the median are considered hierarchical types, and subjects with scores at or below the median are considered egalitarian types. We compare conditional cooperative behavior by the four worldview types. Table 2 presents the aggregate measures of subject behavior for the pooled and worldview-specific samples.

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[2] The average individualist-communitarian score was 12.58 ranging from 6 to 20. The average hierarchical-egalitarian score was 8.67 ranging from 4 to 20.

Conditional cooperation. We consider two metrics for conditional cooperation. First, we report the percent of subjects that exhibit conditional cooperative behavior, as defined by the literature (Fischbacher et al. 2001; Kocher et al. 2008).[3] Second, we report the mean Spearman rank correlation coefficient (rho), which is a continuous measure of the strength of the relationship between own and others' contributions (higher rho indicates stronger relationship).

Table 2 shows, for the pooled sample, the mean correlation coefficient between own and others' contributions registered 0.696, with 73.6 percent of subjects being conditional cooperators and 16.9 percent being pure free-riders. These proportions fall within the range of findings reported in previous experiments (e.g., Fischbacher et al. 2001; Kocher et al. 2008). Differences emerge when stratifying by worldview type. Considering the individualism-communitarian dimension, we find the correlation coefficient is significantly less among individualists than communitarians (0.601 vs. 0.789; p<0.01). This translates to conditional cooperators being less prevalent among individualists than communitarians (62.6 vs. 84.3; p<0.01), while pure free-riders are more common among individualists than communitarians (26.3 vs. 7.8; p<0.01). Turning to the hierarchical-egalitarian dimension, we find more similar behavior across worldviews. The correlation coefficient registered 0.672 and 0.718 for hierarchical and egalitarian types (p=0.456), which corresponds to hierarchical and egalitarian types having similar rates of conditional cooperators (71.3 vs. 75.7; p=0.480) and pure free-riders (14.9 vs. 18.7; p=0.476).

Unconditional contributions. The first row of Table 2 reports the mean unconditional offer—i.e., the offer made without information on others' contribution. Consistent with Fischbacher et al. (2001), the mean unconditional contribution is 6.98 tokens or about a third of the endowment.

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[3] A subject is conditionally cooperative when tests indicate a significant (p<0.01) and positive Spearman rank correlation coefficient (rho) between her own contribution and others' contribution.

However, the level of unconditional contributions varied across worldview types. Individualists contribute significantly less than communitarians (5.69 vs. 8.23; p < 0.01), while unconditional contributions are similar across hierarchical and egalitarian types (6.80 vs. 7.13; p=0.732).

Table 2. Conditional cooperation and cultural worldviews: summary results

	Pooled (n=201)	Individualist (n=99)	Communitarian (n=102)	Hierarchical (n=94)	Egalitarian (n=107)
Unconditional Offer	6.98	5.69	8.23	6.80	7.13
Conditional Cooperator (Rho)	0.696	0.601	0.789	0.672	0.718
Conditional Cooperator (%)	0.736	0.626	0.843	0.713	0.757
Pure Free Rider (%)	0.169	0.263	0.078	0.149	0.187
Hump Shaped (%)	0.060	0.061	0.059	0.085	0.037
Other (%)	0.035	0.051	0.020	0.053	0.019

4. Conclusion

Results indicate that conditional cooperation systematically varies across worldviews, particularly across the individualist-communitarian dimension. We find that conditional cooperative behavior is significantly more prevalent among communitarians than individualists, and that communitarians also contribute more unconditionally than individualists. Individualists, on the other hand, are significantly more likely to be pure free-riders. We find no statistically significant differences along the hierarchy-egalitarianism dimension. This finding that conditional cooperation is more closely associated with communitarianism than egalitarianism

corresponds to previous findings that reciprocity is more important than distributional concerns as motive for fairness-driven sanctions of non-cooperative behavior (Falk et al., 2005).

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