Measuring Ethnic "Technology"

Draft Experimental Protocol

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This memo describes an experimental data collection protocol, which will be undertaken this summer in Uganda. The protocol we describe is part of a larger project that investigates and attempts to assess the relative power of four distinct mechanisms through which ethnicity may facilitate or hinder collective action. These include preference-based mechanisms, institution or reciprocity-based mechanisms, focal point mechanisms, and technology mechanisms. This memo describes the data collection protocol we have designed to test the latter.

The technology mechanism is based on the idea that ethnicity provides a shared set of tools – information networks, language, and shared understandings about modes of social interaction – that makes it technologically easier for individuals to coordinate with co-ethnics. These technological aspects may be a precondition for the use of social institutions or they may function independently of them.

The larger project employs versions of standard experimental economics games to investigate the first three mechanisms (we investigate actors' preferences via the Dictator Game; reciprocity mechanisms via the Trust and Ultimatum Games; and coordination dynamics via the Voting Game), but there are no existing "off-the-shelf" games that we know of that would permit us to explore our fourth mechanism, which emphasizes the technological advantages of ethnicity. This draft protocol describes two approaches – one with simulated interaction, and the second involving face-to-face contact – we have designed to measure ethnic technology. Before describing these approaches, we will first present some results of pilot work, conducted at UCLA and USC, which employed a different game (which we have decided not to use in Uganda) that was also designed to test the effects of ethnic technology.

The Pilot: UCLA and USC

In a pilot experiment involving UCLA and USC students from seven different ethnic groups (African Americans, Arabs, Asians, Caucasians, Indians, Latinos, and Iranians/Persians) we employed a new game – the complexity game – which was designed to measure the extent to which shared ethnicity offers players a technology conducive to collective action. The complexity game is a variant on the children's game 'telephone,' and is designed to capture one aspect of ethnic technology: the ability to transfer information from point to point.

The game was played as follows using a computer interface.

1. Players A and B are given a common set of information about each other.

2. Player A's task is to record a given statement that will be given to Player B and that B can, in turn, relay back to the investigators, uncorrupted. She is told that B will receive a fixed sum upon successful delivery of whatever message A gives B.[1]

3. A is asked to wager a share of $1 on Player B's likelihood of delivering the original message uncorrupted. If the delivery is successful, then the wager is tripled and returned to A. B has no information on the size of the bet placed by A.

The wager in this game is designed to estimate Player A's confidence that Player B is *capable* of relaying a message constructed by A.[2] Insofar as co-ethnics have greater confidence in each other to faithfully relay their messages in this game, and gain higher payoffs in this game, we attribute this to a technological mechanism – the ability to communicate, and to have confidence in the capabilities of others to interpret and relay communications.

This involves aspects of a communications technology: it may simply be easier for a player to pass on a message, for linguistic or other reasons, to a partner from the same ethnic group. But it also involves estimates of the cognitive capacity of others, whether or not they are co-ethnics. In particular, the game is designed to minimize the likelihood that variation can be attributed either to preferences, institutions, or the use of focal points.

Some Early Results

Tables 1-6 present some preliminary results from the pilot experiment. The first three tables focus on the wagers made by Player A. The final three tables present the success rates – in terms of transferring the message – across different types of pairings.

If we are right that the game accurately simulates the technology mechanism, the experimental findings do not seem to support the hypothesis that technology is a key channel enabling members of ethnic groups to coordinate with one another, at least in the

[1] The message is designed to be minimally complex and to be the kind of message that one may want to relay to a business partner. Note that the reward to Player B does not depend on the size of the wager placed by Player A. Here are two examples of the six messages used. "I hope you can come to the meeting on Tuesday. If you come, please bring some pens and paper and also three bottles of water, some ice, glasses, and a copy of today's newspaper." And we also used: "To get to the meeting, you have to take the number 4 bus to the last stop. When you get off the bus, turn left and take the first street on your right. Walk down that street and turn left at the intersection. Then you should see a red building. The meeting will be on the second story of the building."

[2] In the experiment, we record the method used by A to transfer the message to B as well as the relaying of the message from B back to the investigators. This provides further information on how individuals from different groups "encode" their message depending on who they are talking to. The key concern for us, however, is in the confidence that Player A has that Player B may deliver her message.

sample of college students.[3] In fact, the only clear effects are "main effects" – that is, some ethnic groups are more likely to make high wagers (Arabs and Persians in particular), or elicit high wagers from their partners (Indians and Arabs). But mean wagers in in-group and out-group pairings are not significantly different than one another.

There is some stronger evidence – as there was in the dictator and ultimatum games – that gender effects may be present. Men wager significantly more than women.[4] Moreover, men make higher wagers when paired with another man; women do the same, taking relatively more risk when paired with a woman.

One of the innovative features of the experiment was that research subjects were provided with different levels of information about their partners. In some rounds of each game, players were shown photographs of their partners. In other rounds, they were shown brief videos of their partners, either greeting them or saying their names. In still other rounds, they were shown a message indicating that they had "no information about their partner for this round." This experimental manipulation about the level of information players had about each other permitted us to investigate the impact of information on players' behavior. We find some (albeit weak) evidence that information about a partner makes a player more willing to make a high bet. Information increases the average wager by just over 4 cents.

The results are not more encouraging for ethnic effects when it comes to the successful transfer of messages. Again, there are group main effects – message transfer is most likely to be successful if pairings include African Americans (in the first role) or Arabs and Persians in the second role (suggesting those who wager are making pretty good bets). Yet, table 4 does not suggest any ethnic diagonal, which we might expect if individuals could more successfully pass messages with members of the same ethnic group.

Again, there are gender effects in success rates as well. Men are better at passing messages in general, and their success rates are higher when paired with another man. There is no significant difference for women.

The Proposal: Uganda

Taking the same experimental protocol we used in Los Angeles and employing it in Uganda would add a host of complexities to the experimental enterprise. As investigators, our first priority is to ensure that subjects understand the situation they confront in the game. For this reason, experimentalists – particularly those working in

[3] Importantly, the co-ethnic variable really captures co-ethnic pairings of three types: with Caucasians, Asians, and Latinos. As a result, we cannot comfortably say no co-ethnic effects exist for the other groups included in the sample.

[4] The difference in wagers is very large (close to 15 cents), and mean wagers made by men and women are significantly different than one another at the 99% level.

developing country settings – have shied away from computer interfaces in favor of some form of face-to-face interaction. In addition, the stakes of the game must be made to feel real for participants. While college students in the U.S. may believe that the experimenters will actually pay the accumulated gains at the end of the experiment, those expectations are less likely to be held in Uganda. A third concern is that the subjects themselves may lack the facility to utilize a computer terminal to read the message, record a response, and enter a wager.

More generally, for all of the games we employ, we are concerned with the external validity of our findings. Insofar as possible, we hope to move the experiments from lab to field settings while still retaining experimental control.

For these reasons, we have designed a new variant of the complexity game (with two components) that employs face-to-face interaction to measure two distinct aspects of ethnic technology, rather than the single one captured in our pilot experiment.

The first aspect of technology is that studied in the original game: communications technology. The second aspect is the gains to productivity that may follow from preexisting social networks. Players might favor working with co-ethnic partners because they can be more productive as they are able to draw on the ties that connect them to their partner.

We propose to examine communications technology through a game that works as follows:

1. 24 players from two different ethnic groups are invited to a primary school.[5] They are broken up into three groups: 8 to Group A, 8 to Group B, and 8 to Group C. Each player receives a fixed sum of $5 for showing up to participate.

2. Groups A and B are ethnically homogenous, while group C is equally divided between the two ethnic groups.

3. Working one group at a time, each member of the group is randomly assigned to a classroom, numbered 1-8.

4. The experimenter provides a minimally complex message to the player stationed in classroom 1, delivered in the national language (English).

5. The player in classroom 1 enters classroom 2 to pass the message on to her partner. The passing of the message is recorded by a device pre-installed in the room. This exercise is repeated until the message has been passed to the player in classroom 8, who then returns the message to the investigator.

[5] With approximately 100 subjects in each city, the actual experiment will be run a total of eight times, generating 72 total playings and 504 individual to individual observations of message transfer.

6. With the first group, the experiment is then repeated twice, with the message delivered in each of the two local languages spoken by the players participating that day.

7. The experiment is repeated with the other two groups.

The strength of social networks is assessed in the following way:

1. 50 players are assigned to group A and 50 players are assigned to group B in each of two cities, Kampala and Jinja (for a total of 200 subjects). Subjects in Group A are the "runners" and those in group B are the "receivers."

2. Each receiver chooses a codeword that she can subsequently share with a given runner to demonstrate that the runner has in fact met the receiver (for example, this could be the receiver's birthdate).

3. The runners convene in a location with a set of linked computers on a Saturday morning at 8:00AM.[6] Proctors will provide a basic description of their task. Runners will be shown information about two potential partners (a picture, video greeting, *and* name). Runners will be asked to select the partner with whom they wish to play the game.[7] The task of the runners is simply to find their partner (who resides in the same city, either Kampala or Jinja). Runners will have no additional information about their partner beyond what is provided by the experimenters.

4. Runners will then receive an initial sum of $3. The $3 is an initial endowment that runners can use to pay for the transport costs associated with finding their partner. Runners can also choose to keep the $3 and opt out of the experiment. If runners choose to play the game, they will have the opportunity to earn $12 if they successfully find their partner. Of the $12, one-half will be a lump-sum provided if the receiver is found. The additional $6 will be awarded on the basis of how long the runner takes to identify the receiver, with the reward decreasing proportionately as the amount of time increases.

5. If runners opt to participate in the experiment, they will be released from the session to begin searching for their partners at 9:00AM. They will have a total of 24 hours to find their partner.[8]

[6] The games will be played on four consecutive Saturdays so that only 12 or so subjects will need to be monitored on a given day.

[7] We can implement variants of the game in which partners do not have a choice about their partner, but with a small sample size, this will reduce our sample of co-ethnic pairings.

[8] We can use a variety of tools to examine how these social networks function in practice. Runners may be asked to keep a running list of the strategies they employ and the people they contact. We might also consider using GPS devices that automatically record the spatial progression of their search for the receiver. Finally, after the game is completed, we may conduct debriefings to gather more information about successful (and unsuccessful) strategies.

6. When a runner finds a receiver, the receiver in turn passes his code to the runner. At this point the runner can contact the experimenters (by phone) and communicate the receiver's codeword indicating that the transfer of the message has taken place. This provides a measure of exactly how long it takes different individuals to identify and find random individuals inside or outside their networks.[9]

In these versions of the complexity game, we obtain a series of measures of ethnic technology.[10] In the first game, we are able to assess the ability of homogenous and heterogeneous groups to successfully communicate with one another, and to see how that varies with the language in which the message is passed. Moreover, with the use of recording devices, we can explore the characteristics of the individual pairings to look at where communication breaks down.

In the second game, we are able to measure an individual's confidence that he can find his partner. Whether an individual chooses to invest $3 in the game provides a clear indicator of this level of confidence. The choice of partner also provides valuable information about a player's assessment of the likelihood of success. Finally, the game provides an assessment of the relative strength of social networks as indicated by the time it takes individuals to find their partners.

[9] Of course, the time it takes a runner to find a receiver is a measure *both* of the strength of social networks and logistical considerations. Using background data on both runners and receivers, we will be able to control for the distance between a runner's home and that of the receiver, in order to parse out the true network effect.

[10] Our experiment will measure group-specific technology effects only to the extent that they emerge from a random sample of respondents in Kampala and Jinja. External validity is an important concern for experimental work in general. In the case of this experiment, we will not be able to assess how important technology effects are in the population in general, nor be able to isolate what may be technology effects specific to particular communities or neighborhoods, rather than to the groups in general. Running it in both Kampala and Jinja offers us some leverage over context-specific variation and its impact on the strength of networks, but our sampling design will not be representative enough for us to distinguish neighborhood effects at a lower level of disaggregation.

Preliminary Results from the Complexity Game

Table 1: Mean Wagers (by Ethnic Group)[11]

Ethnic Group of Receiver	Ethnic Group of Offerer: African American	Arab	Asian	Caucasian	Indian	Latino/a	Persian/ Iranian	Total
African American			**79.17** **(6)**	52.90 (19)	23.33 (3)	46.50 (10)	67.00 (15)	56.98 (53)
Arab			75.43 (7)	67.27 (11)	**70.71** **(7)**	28.33 (3)	71.00 (5)	66.76 (33)
Asian	35.80 (10)	74.17 (6)	56.48 (29)	55.87 (23)	30.00 (4)	**57.08** **(12)**	59.17 (6)	54.29 (90)
Caucasian	51.25 (12)	66.00 (15)	49.92 (26)	63.02 (50)	45.00 (4)	44.74 (19)	**73.33** **(6)**	57.00 (132)
Indian	**73.75** **(4)**	**78.75** **(4)**	53.33 (3)	**82.86** **(7)**	50.00 (1)	53.33 (3)		70.91 (22)
Latino/a	40.09 (11)	65.00 (6)	54.87 (16)	59.64 (22)	55.00 (5)	50.68 (22)	73.00 (5)	54.90 (87)
Persian/ Iranian	48.67 (15)	74.33 (6)	51.87 (8)	43.50 (10)		38.00 (5)		50.36 (44)
Total	46.90 (52)	69.89 (37)	56.76 (95)	59.92 (142)	49.58 (24)	47.97 (74)	68.11 (37)	56.80 (461)

Table 2: Mean Wagers (by Gender)[12]

Gender Group of Receiver	Gender Group of Offerer: Male	Female	Total
Male	70.24 (76)	47.57 (100)	57.36 (176)
Female	62.64 (109)	52.63 (176)	56.46 (285)
Total	65.76 (185)	50.79 (276)	56.80 (461)

[11] With some information provided about receiver.
[12] With some information provided about receiver.

Table 3: Determinants of Wagers

		Mean Wager	Difference (p-value)
In-group/ Out-group Pairing[13]	Receiver is From Offerer's Ethnic Group	58.37 (127)	2.02 (0.56)
	Receiver is Not From Offerer's Ethnic Group	56.35 (496)	
Level of Information	Some Information	56.80 (461)	4.71 (0.12)
	No Information	52.09 (162)	
Gender Pairing[14]	Offerer and Receiver Share the Same Gender	57.94 (308)	2.51 (0.38)
	Offerer and Receiver Do Not Share the Same Gender	55.43 (315)	
In-group/Out-group Pairing (Offerer is Male)	Receiver is From Offerer's Ethnic Group	64.04 (49)	-2.34 (0.65)
	Receiver is Not From Offerer's Ethnic Group	66.38 (136)	
In-group/Out-group Pairing (Offerer is Female)	Receiver is From Offerer's Ethnic Group	53.13 (53)	2.89 (0.52)
	Receiver is Not From Offerer's Ethnic Group	50.24 (223)	

[13] With some information provided about the identity of the receiver.
[14] With some information provided about the identity of the receiver.

Table 4: Percent Successful (by Ethnic Group)

Ethnic Group of Person Recording the Message	Ethnic Group of Person Relaying the Message								
		African American	Arab	Asian	Caucasian	Indian	Latino/a	Persian/ Iranian	Total
	African American			75.00 (8)	61.11 (18)	33.33 (3)	**100 (6)**	78.57 (14)	71.43 (49)
	Arab			**80.00 (5)**	30.00 (10)	**60.00 (5)**	66.67 (3)	25.00 (4)	48.15 (27)
	Asian	57.14 (7)	66.67 (6)	59.26 (27)	60.71 (28)	25.00 (4)	22.22 (9)	83.33 (6)	56.32 (87)
	Caucasian	62.50 (16)	71.42 (7)	58.33 (24)	53.85 (52)	33.33 (9)	62.50 (16)	**85.71 (7)**	58.02 (131)
	Indian	50.00 (4)	66.67 (6)	40.00 (5)	44.44 (9)	0.00 (1)	0 (1)		46.15 (26)
	Latino/a	**66.67 (6)**	**100 (4)**	33.33 (9)	**73.68 (19)**	33.33 (3)	53.85 (13)	25.00 (4)	58.62 (58)
	Persian/ Iranian	54.55 (11)	**100 (3)**	42.86 (7)	50.00 (6)		66.67 (3)		56.67 (30)
	Total	59.09 (44)	76.92 (26)	56.47 (85)	56.34 (142)	36.00 (25)	56.86 (51)	68.57 (35)	57.84 (408)

Table 5: Percent Successful (by Gender)

Gender Group of Person Recording the Message	Gender Group of Person Relaying the Message	
	Male	Female
Male	64.18 (67)	57.73 (97)
Female	56.12 (98)	56.16 (146)
Total	59.39 (165)	56.79 (243)

Table 6: Determinants of Success

		Success Rate	Difference (p-value)
In-group/ Out-group Pairing	Players are from the Same Ethnic Group	54.84 (93)	-3.89 (0.51)
	Players are not from the Same Ethnic Group	58.73 (315)	
Level of Information	Some Information	59.16 (311)	5.56 (0.34)
	No Information	53.61 (97)	
Gender Pairing	Players Share the Same Gender	58.69 (213)	1.76 (0.72)
	Players Do Not Share the Same Gender	56.92 (195)	