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When Giulia and Andrea meet Salma and Omar: Essays on cultural adaptation

Theory and Evidence

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When Giulia and Andrea meet Salma and Omar: Essays on cultural adaptation

Theory and Evidence

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When Giulia and Andrea meet Salma and Omar: Essays on cultural adaptation

Theory and Evidence

Summary

Culture plays a very important role in determining the preferential traits such as social preferences, risk preferences, time preferences and other cultural traits including fertility practices, civic participation, gender differences in education as well as labor market. Therefore, with increasing levels of migration from all parts of the world intercultural contact is inevitable which leads to individual as well as societal implications. This may lead to innovation, more varieties of goods available for consumption, creativity, cognitive complexity etc. For example, a diverse organization may be able to solve a problem from different perspectives to have a more creative solution for the problem. Assuming that humans prefer variety in their life, cultural diversity may increase the number of varieties available, for example restaurants with different cuisines. Individuals may also benefit from health related practices in different cultures, for example Yoga or the herbal Chinese medicine. However, cultural diversity and inter-cultural contact may also lead to value clashes, conflict or higher levels of discrimination. These benefits of cultural diversity can be maximized and the costs/losses can be minimized if the hybridization of culture that emerges from this inter-cultural contact comprises aspects of both cultures. Therefore it is of extreme importance to understand this dynamic when different cultures come into contact with each other.

While studies exist on the hybridization of cultures, researchers have focused on the adaptation patterns of immigrants but only from the minority perspective with immigrants assimilating into the majority culture. That is the hybrid culture either consists aspects of only the majority or it leads to a segregated society. However, the natives' adaptation levels play an equally important role in accruing the benefits of cultural diversity. Researchers in cross cultural psychology have shown if the hybrid culture consists of aspects

of both cultures, it leads to lower levels of discrimination, a lower risk of conflict and a multicultural society with more varieties to consume, with higher levels of creativity and innovation among other benefits. This dissertation addresses this knowledge gap by examining two potential factors that may affect the adaptation levels of immigrants and natives. The first factor is the strength of group identity or the conformity pressure from the peers belonging to the same culture. This may affect the adaptation levels of immigrants as well as natives. The second factor is the proportions of the two groups which can also play a crucial role in affecting these adaptation levels and whether the hybridization of the culture constitutes the aspects of both cultures.

Chapter 1 of this dissertation introduces a theoretical model consisting of a cultural adaptation game focusing on the effects of strength of group identity and share of the minority in the population on the adaptation levels of the minority as well as the majority. The model focuses on the trade off between coordinating with own group members by playing a pure coordination game and cooperating with other group members to increase the gains from adaptation by playing a variant of a public good game. The coordination with own group members corresponds to the identity loss or the conformity pressure that an individual may face by own group members. If the group identity is strong or sanctions from the groups are high such as getting outcast from the group or extreme behavior such as honor killings in India as well as other countries, it may affect the individual's incentive to adapt to the other culture. The cooperation with the other group members corresponds to the gains from adaptation which increase with mutual adaptation by embracing each others cultural practices. The model predicts four pure strategy Nash equilibira that exist where either, both or none of the groups adapt to the other groups norms. The results of the theoretical model show that it is in the interest of and socially optimal for a small minority to assimilate into the majority culture. However, with a sizable minority the likelihood of no one adapting increases and minority assimilating into majority decreases leading to a segregated society even though mutual adaptation is Pareto dominant as well as socially optimal. The results do not change with the change in group identity, that is irrespective of whether the group identity is weak or strong, a small minority tends to adapt to the other culture and a big minority leads to segregation.

In Chapter 2, I test the predictions of the theoretical model and the possible ways to improve efficiency by conducting a laboratory experiment. The experiment follows the structure of the cultural adaptation game from Chapter 1 where mutual adaptation is socially optimal. In the experiment, I focus on the share of the minority to be one-third and strong group sanctions. This improves the external validity of the experiment. The

results from the experiment reveal that with a one-third share of minority, the minority participants are equally likely to adapt or not, however the majority participants never adapt. This leads to a hybrid culture either consisting of only majority practices or it leads to a segregated society even though mutual adaptation is socially optimal. To improve efficiency, I introduce the possibility of communication through a leader. There is one participant selected from the minority and one from the majority who can send a message to the rest of the participants. I consider a 2X2 design. The first dimension is based on the ability of the leader (high or low) and the second dimension is based on which participants receive the message by the leader, that is either only the same group participants receive the message (Partisan) or all participants receive the message (Universal). The results of the experiment reveal that only leaders with high ability and who can send a message to all the participants irrespective of the group can lead to mutual adaptation and an increase in efficiency. This shows that the ability of the leader and who receives the message from the leader is extremely important in improving efficiency.

The last chapter of this dissertation gives a literature review on the role of the host country characteristics affecting the adaptation patterns of immigrants. This review combines literature from economics, political science and cross cultural psychology on three different aspects of host country characteristics that are important for the adaptation patterns. The first is from the immigrants' perspective including factors such as ethnic fractionalization, the size of the cultural group, the spatial segregation, and group sanctions. These factors are researched upon mostly in economic literature. The second aspect is from the natives' perspective which includes the attitudes of natives' towards immigrants, towards cultural diversity tolerance and group identity. These factors are researched upon extensively in cross cultural psychology where the natives' acculturation strategies play a crucial role in the hybridization of different cultures. The third perspective is based on the policies and the institutions in the host countries including factors such as naturalization, integration policies, education institutions, legal rights and anti-discrimination laws. These factors are researched extensively in political science literature where researchers have been able to successfully show that the policies also play a very important role in supporting the integration of immigrants. I end this review by showing a correlation between the integration patterns of immigrants from different cultural origins and the attitudes of natives towards diversity and immigration. Using the European Social Survey data from different European countries, I show that natives attitudes towards diversity and immigration are positively related to the civic participation of immigrants, attitudes towards homo sexuality as well as religiosity but

no significant correlation between traditional values, the praying frequency or the trust levels of immigrants.

This dissertation contributes thematically and methodologically to the existing literature by enhancing our understanding of the cultural adaptation process and how we can improve the adaptation levels to improve efficiency in today's globalized world where inter-cultural contact is inevitable.

1

When Giulia and Andrea meet Salma and Omar: A theory of cultural adaptation

1.1 Introduction

Cultural values, beliefs and norms play a very important role in shaping dietary and culinary practices, clothing, medical treatment etc. or preferences such as risk attitudes, time preferences, social preferences, altruism etc. These practices or preferences may differ across cultures such as in Hinduism cows are considered to be sacred whereas eating beef is allowed in Islam. Punctuality is considered to be very important among Germans as compared to other cultures. Historical practices such as traditional Chinese medicine including herbal medicine, acupuncture etc., which are still practiced, are different from the scientific Allopathic medicine practiced in other parts of the world.

What happens when these different cultural practices come into constant contact with each other? In today's globalized world, cultures are interacting, changing and evolving systems due to cross cultural interactions rather than independent static entities (Morris et al. 2015). Cross cultural interactions may influence how people see themselves and others, and how they organize the world around them (Benet-Martínez 2012) presenting different challenges and opportunities for social cohesion. Due to the continuous cross cultural interactions some cultural practices go extinct such as foot binding or many of the languages have become extinct. While some absorb diverse cultural influences creating hybrid cultures such as Creolization where Creole cultures emerged in colonial societies with aspects of different cultures, integration of different styles of art, music or combining different cuisines.

Previous empirical research has shown that cross-cultural interaction may lead to in-

crease in productivity, and innovation (Ashraf & Galor 2013; Montalvo & Reynal-Querol 2005), greater academic achievement (Régner & Loose 2006), greater cognitive complexity (Benet-Martinez 2006), integrative complexity (Tadmor et al. 2009), creativity (Maddux & Galinsky 2009), better health outcomes, positive inter-group attitudes and social behavior (Schofield 1991). For example, use of traditional Chinese medicine for creating new drugs such as the antimalarial drug Artemisinin, or the first widespread treatment of malaria called quinine was developed by the indigenous people of Peru and spread by the British and Jesuits to the rest of the world. However, a large empirical and theoretical literature also links greater cultural diversity with conflict (Esteban & Ray 2011), low levels of public good provision (Miguel & Gugerty 2005), low levels of cooperation across different cultural groups (Humphreys et al. 2009) and diminished economic growth (Easterly & Levine 1997). At the individual level cultural diversity can also lead to acculturation stress, bringing to mind identity confusion, dual expectations, and value clashes (Padilla 1994; Phinney & Devich-Navarr 1997).

Part of these different outcomes of the cultural practices can be explained by the intergroup relation, the acculturation patterns and the adaptation levels of the actors from different cultures. Based on a framework of visions of differences and the degree of adaptation levels, researchers identify different multicultural ideologies which may explain the different trajectories of the cultural practices evolution. These different ideologies are termed as assimilationalism, interactive pluralism, and fragmented pluralism (Berry 1997; Hartmann & Gerteis 2005). That is, if members of both the groups adapt, an integrated or an interactive pluralistic culture emerges with aspects of both cultures; members of only one group adapting leads to an assimilated culture with homogenization of cultural practices with aspects of only one culture; no one adapting leads to fragmented pluralistic or a segregated society. For example, countries like Canada were the first advocates to support interactive pluralism or countries like India where festivals of different religions are celebrated with great enthusiasm. While others could have only the dominant culture practiced and the different minorities assimilate into the majority culture such as the aboriginals in Canada during the 19th century assimilated into the mainstream culture. A third possibility is a segregated society with no adaptation from either cultures leading to high levels of conflict such as African countries.

Different levels of adaptation by individuals belonging to different cultures can get affected by many factors such as integration policies, institutions, ethnic enclaves etc.[1] This

1 Please refer to the third chapter of this thesis for a detailed discussion on how these factors affect the acculturation strategies and the integration patterns.

paper focuses on four factors that may affect individual/group strategies for choosing the adaptation level and the resultant multicultural-ideology in a culturally diverse society: the preference towards the norms of one's own culture which affects the cost to adapt, the group identity or the conformity pressure from own cultural types, the gains/losses from the resultant multicultural ideology in equilibrium which is based on the adaptation/cooperation levels between groups, and the share of the groups in the population. I propose a simple model of inter-cultural contact with a set of agents partitioned into two cultural groups with different initial preferences and norms (Lazear et al. 1999; Kuran & Sandholm 2008; Carvalho 2017). Individuals are matched randomly in pairs irrespective of the cultural group. All individuals must choose between following own norms or adapting to the other groups' norms without knowing whom they are matched with. The payoffs are structured in such a way that agents must coordinate with their own group members as well as cooperate with other group members to maximize their payoffs. Under equilibrium, these choices map into the multicultural ideologies, that is assimilation if individuals from only one group adapt, integration if both groups adapt and segregation if none of the groups adapt. We are interested in which equilibrium do individuals converge to. A key feature of the model is that equilibrium behavior is driven by both coordination levels within groups and the cooperation levels between groups. The within group coordination is affected by the degree of individual as well as distinct communal identity and the importance of conforming to own group norms. This in group conformity pressure reduces the willingness to cooperate and learn the practices of other cultures and imbibe them to develop a hybrid culture which has aspects of both the cultures. This in turn drives the cooperation between groups. The benefits due to the cooperation levels between diverse cultural groups depend on the resultant multicultural ideology and the form of hybrid culture that emerges under the long run equilibrium.

The results of the theoretical model show that the proportions of the two groups play a very important role in determining whether the hybridization of the culture constitutes aspects of both cultures, one culture or if we have a segregated society with least cooperation between groups. It is in the interest of a small minority to assimilate into the majority culture. As the proportion of the minority increases, the between group cooperation and the structure of the hybrid culture depends more on the within group coordination. The hybrid culture could take any form of assimilation, fragmented or an interactive pluralistic society based on how the groups are able to coordinate within themselves. To understand the equilibrium selection, I conduct computerized simulations with myopic and boundedly rational agents which reveal that the likelihood of converging to a fragmented society is high even though mutual adaptation is Pareto dominant

and socially optimal. The results do not change with the change in individual identity, group identity or the gains/losses from integration, that is whether the identity is weak or strong or the gains/losses are small or large, a small minority tends to adapt to the other culture and a big minority leads to segregation.

The previous models incorporate only the first two aspects focusing on how the minority or immigrants can gain from assimilating into the majority culture (Lazear et al. 1999; Kuran & Sandholm 2008), however the third aspect is equally important for the hybridization process. Recent literature has focused on the network formation with the other group members that may have economic benefits (Advani & Reich 2015; Goyal et al. 2017). However, these models do not take into consideration the possibility of hybridization of cultures by taking a common action. In these models cultural diversity is assumed to be beneficial when individuals from different cultural groups interact with each other while maintaining own cultural norms but not based on mutual adaptation and learning the other cultural practices. This may lead to conflict as the identity can still be threatened if the practices differ even though individuals have formed networks for economic benefits. Secondly, these models assume benefits based on a unilateral network. In contrast, I take diversity to be beneficial when there is bilateral learning that is there is adaptation from both the groups involved. Secondly, these models concentrate on choosing a network where as I concentrate on random matching, for example meeting the other group members at public parks, schools or offices, where individuals may end up interacting without a voluntarily network. Although forming a network, or choosing to live in a segregated neighborhood would affect the random matching, there is still some likelihood of interacting with members from other groups. Although the perfect model would be to have random matching based on the network, I focus on the random matching after the network has been chosen. Thirdly, the benefits in this model depend on not just own action but also the actions of the other. In previous models, the benefits are only based on what an individual does and whether he/she chooses to have a network or not. This model combines these different aspects from Kuran & Sandholm (2008) & Advani & Reich (2015); Goyal et al. (2017) where individuals do not choose the network and there are benefits from interactions with both group members based on the cultural practices of the whole population.

In the following sections, I first describe the model incorporating all these features making them parallel to the real-life scenarios in section 2. In section 3, I describe the equilibrium outcome based on the computerized simulations and section 4 concludes.

1.2 The model

I model a population of individuals belonging to distinct cultural types and living in the same neighborhood. Culture here is defined as the traditions and practices accepted within a type such as the way of dressing, the food habits, the different ways to greet, punctuality among other things. From hereon, I call these traditions and practices "norms". The norms constitute social capital promoting trust, networks, coordination and the like between individuals of the same type. Deviating from the norms leads to costly punishment or sanctions to the individuals deviating by their peers of the same type to maintain the norms and social capital.

The model incorporates three important features that mirror widespread behavioral practices in the field. The technical details of these features follow in the next sub section. The first important feature is the individuals' choice over which norms to follow. Individuals can either choose to follow the norms of their own type or choose to adjust to the norms of the other types. Individuals have an identity defined by the norms of their own type and they can follow these norms without any effort. Adjusting to the norms of the other types involves an individual cost and exposes them to sanctions from their peers of the own type. The individual cost could be both monetary and non-monetary. For instance, breaking a habit like adjusting to the eating habits or the way of dressing, learning a new language, or forming a new identity. Along with the individual cost, there could be sanctions from peers of own type because of not following the norms, causing further identity confusion and psychological stress. These sanctions could vary in different cultures such as weak sanctions like getting outcast from the group or strong sanctions like honor killings.

Social interactions are at the root of several important socioeconomic phenomena, from smoking and other risky behavioral patterns to peer effects in school performance (Bisin et al. 2011). The second main feature of the model concerns how social interaction takes place in a population. On one extreme, individuals may choose the type they want to interact with (for example preferring to meet the own type and avoiding the outsider). On the other extreme, interaction could be entirely at random and hence depending essentially on the share of different types in the population, similar to the theory of "contact zone" which is the space in which geographically and historically separated people come into contact with each other (Pratt 1992). These encounters may happen in public spaces such as schools, playgrounds, street markets, local parks, offices etc. (Butler 2008). With the current levels of migration and globalization, groups of

different backgrounds, ethnic and otherwise, cannot help but enter into relations with each other, no matter how great the desire for separateness and the attempt to maintain cultural purity (Ang 2001). Although, the reality is a combination of the two where there is desired segregation and a possibility of random encounters, I abstract from the possibility of choosing your partners. This model is based on random encounters and these encounters will be in pairs.

The third important feature of the model is that the actions are taken ex-ante and cannot be conditional on the identity or the action of the counterpart that one encounters.[2] For instance, clothing, using gestures, eating habits, sending kids to a given school are choices that cannot be adjusted on the various counterparts that one meets in daily encounters.

1.2.1 Theoretical framework

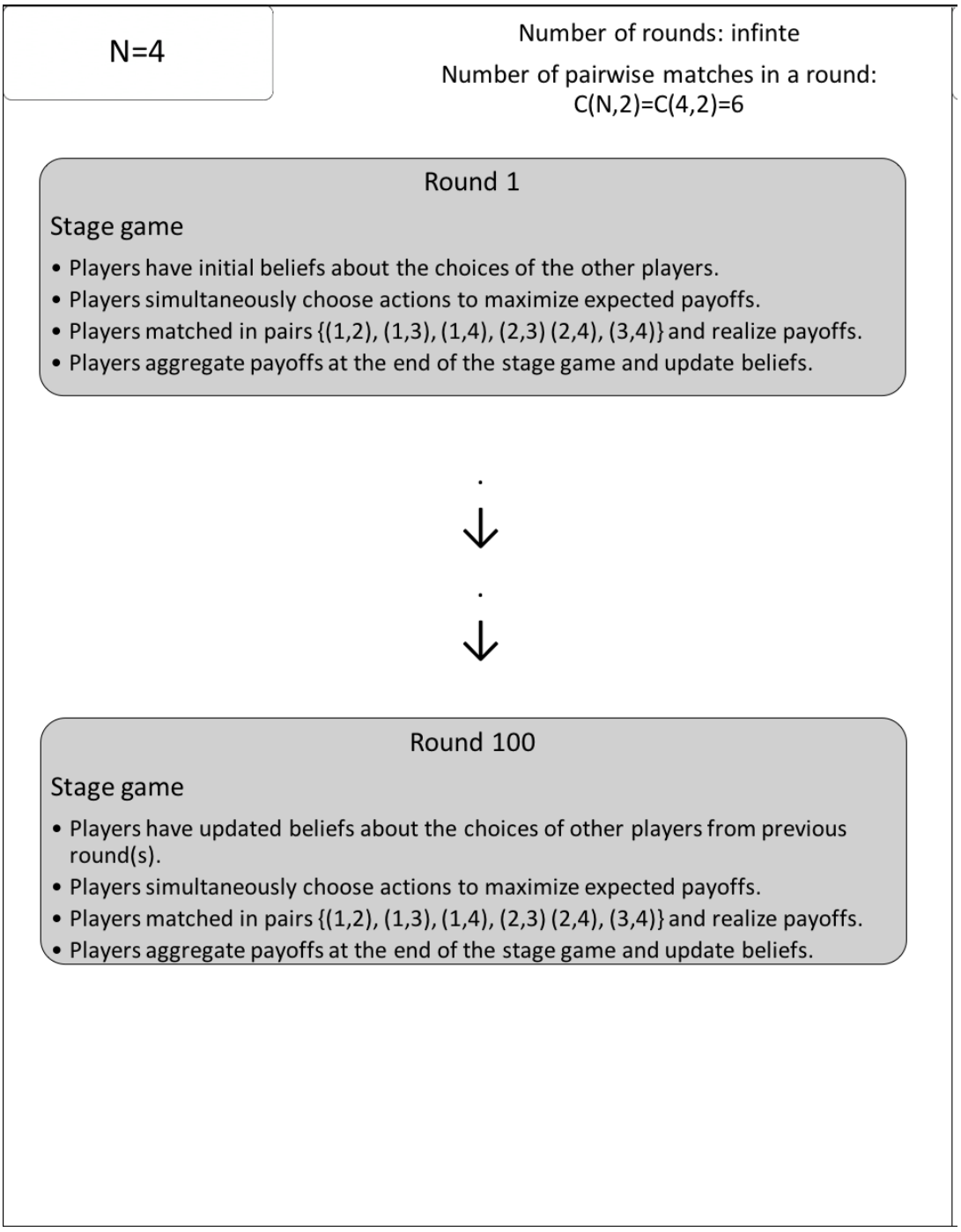
Incorporating these features capturing relevant situations of social interactions in a culturally diverse neighborhood, the model is a Bayesian game of incomplete information. The structure of the model has three levels as depicted in Figure 1.1: a super-game consisting of infinite rounds of a stage game and a stage game consisting of a finite number of pairwise interactions between the players.

At the beginning of each round, each player simultaneously chooses a norm to follow. This choice cannot be changed or adjusted until the next round of the stage game. Players are rational and choose the norm to maximize their expected payoffs based on their beliefs about the choices of other players. Players are assumed to be myopic and maximize payoffs based on the current round and do not care about the future rounds of interactions. After the players have chosen the norm, they are matched with all the other players in the population. Matching is pairwise and following the theory of contact zone, I consider a case where everyone gets matched with everyone in the population in every round. Therefore, if a population consists of N individuals, a stage game consists of C(N,2) number of pairwise matches with N-1 matches for every player. Each player receives a payoff after every match. At the end of each round of the stage game players aggregate their payoffs and update their beliefs based on their personal experience and own payoff from the matches in the previous round(s). This stage game is repeated infinite number of times called a super-game as displayed in Figure 1.1. Let us consider an example before presenting the technicalities of the model. Consider Muslims and

2 That is it is not possible for individuals to be high on neurotic-ism switching cognitive and behavioral frames in response to different cultural cues (Hong et al. 2000).

Christians living in the same neighborhood. Muslims would like to have a mosque and Christians would like to have a Church in the neighborhood. Each group also must take a stand through voting, moral support or monetary contributions on the construction of the other groups' place of worship. Assume every year (=round) each person must take a stand in favor or against the other groups' place of worship. Every year, individuals update their beliefs based on the votes in the previous year. Similarly, this process could be for different domains such as choices over clothing, eating habits, punctuality etc., that is the choice of wearing a veil or a skirt to office gets affected by the choices of the rest of the population today and it affects the choices tomorrow.

Figure 1.1: Structure of a game with 4 players in the population



A super game consists of many stage games. A stage game consists of all the possible matches ($C(4,2) = 6$ here).

Players

A population consists of N individuals belonging to two culturally distinct types

$k \in \{A, B\}$. There are N_A individuals of type A and N_B individuals of type B where $N_A + N_B = N, N_A, N_B \geq 1$ and $N_A \leq N_B$ which is common knowledge. Type A is the minority with a share $p = \frac{N_A}{N} \in (0, 0.5]$ of the total population and type B is the majority with a share $(1-p) = \frac{N_B}{N} \in [0.5, 1]$ of the total population. For analytical simplicity, I treat p as continuous.

Stage game

A stage game is an N player game where each player $i \in \{1, \ldots\ldots, N\}$ of type $k \in \{A, B\}$ simultaneously chooses an action $a_i \in \{e, r\}$ at the beginning of the stage game and is matched with every other player j in the population in pairs with no possibility of changing the action until the next round of the stage game. A stage game has $C(N, 2) = \frac{(N-1)N}{2}$ number of pairwise matches. The action space $a_i \in \{e, r\}$ where r=reject is to follow own norms and e=embrace is to take a step toward or adjust to the norms of the other type. For simplicity and without loss of generality, I assume the model to be symmetric across both individuals and across types. Hence, the action space is identical for all types.

Stage game payoffs

In one round of a stage game, the payoff $\Pi_{i \in k}$ for player i, is the average of the payoffs from $N-1$ matches represented by the function $\pi_{kk'}$ where the first subscript k is i's type and the second subscript k' is j's type. The strategy $s_i \in S_i$ is a singleton set equal to the action and the strategy set is the action space $a_i \in \{e, r\}$:

$$\Pi_{i \in k}(s_i, s_{-i}) = \left(\sum_{j \neq i \in N} \pi_{kk'}(a_i, a_j) \right) / (N-1) \tag{1.1}$$

The payoff $\pi_{kk'}$ player $i \in k$ receives form an interaction with another player $j \in k'$ is dependent on his/her own type $k \in \{A, B\}$ and the type of his/her counterpart $k' \in \{A, B\}$. There are four kinds of matches possible with two types of players $\{AA, AB, BA, BB\}$, that is $\{(i \in A, j \in A), (i \in A, j \in B), (i \in B, j \in A), (i \in B, j \in B)\}$. The corresponding payoff functions for the 4 kinds of interactions can be written as $\pi_{AA}, \pi_{AB}, \pi_{BA}$ and π_{BB}. Since I assume the payoffs to be symmetric, $\pi_{AA} \equiv \pi_{BB}$ and $\pi_{AB} \equiv \pi_{BA}$, from now on, I will use only π_{AA} and π_{BB} to define the payoffs in the four kinds of matches possible as shown in equation 2 and 3 and the corresponding payoff matrices are shown in Table 1.1.

$$\pi_{AA} = 1 - c(a_{i \in k}) - d(a_i, a_j) \quad \text{where if} \left\{ \begin{array}{ll} a_i = a_j & d(a_i, a_j) = 0 \\ a_i \neq a_j & d(a_i, a_j) = d \end{array} \right\} \tag{1.2}$$

$$\pi_{AB} = 1 - c\left(a_{i\in k}\right) + g\left(a_i, a_j\right) \quad \text{where if} \left\{ \begin{array}{cc} a_i = a_j = r & g\left(a_i, a_j\right) = -g \\ a_i \neq a_j & g\left(a_i, a_j\right) = 0 \\ a_i = a_j = e & g\left(a_i, a_j\right) = +g \end{array} \right\} \tag{1.3}$$

Table 1.1: Payoffs in a pairwise match among same types (left panel) and different types (right panel)

SAME TYPE MATCH		Minority A (Majority B)			DIFFERENT TYPE MATCH		Majority B (Minority A)	
$\pi_{AA}(\pi_{AB})$		r	e		$\pi_{AB}(\pi_{BA})$		r	e
Minority A	r	1 1	1-d 1-c-d		Minority A	r	1-g 1-g	1 1-c
(Majority B)	e	1-c-d 1-d	1-c 1-c		(Majority B)	e	1-c 1	1-c+g 1-c+g

The 3 parameters in the two payoff functions are

- $c =$ cost to embrace, the individual cost to adapt to the norms of the other type
- $d =$ identity loss, the loss from mis-coordination between the players of same type
- $g =$ the gain/loss from cooperation between the players of different type

The parameters are such that $c, d, g \in [0, 1]$. The details of these parameters are in the next subsections.

c= Cost to embrace

Cultural habits can be so entrenched that adapting or adjusting to the other culture involves an individual cost independent of what others are doing, for example learning the values, adapting to the food or clothing habits etc. which is not quantifiable. For

simplicity, I take this cost to be $c(a_i)$ as in the previous literature (Akerlof & Kranton 2000; Bisin et al. 2016; Bisin & Verdier 2000) and is given by

$$c\left(a_{i\in k}\right) = \begin{array}{ll} 0 & \text{if } a_i = r \\ c & \text{if } a_i = e \end{array} \tag{1.4}$$

This cost is not dependent on which type is one matched with, rather it is dependent on the action one has chosen at the beginning of the stage game and the cost is paid at the beginning of the stage game. For analytical simplicity, this cost enters the payoff functions for each match.[3] The cost c is positively related to the distance between the two cultures, that is as the length of the norm scale in Figure 2 increases the cost to adjust increases.[4] For instance, it can be easier for a Spanish to adjust to Italian cultural practices, however it could be relatively difficult for a Spanish to adjust to Iranian or Indian practices.[5] Therefore, I assume the cost to be exogenous and in the whole analysis, I assume the cost to be 0.2 which is the same for each individual in the population irrespective of his/her type due to symmetricity.

Payoffs from a single match of same type players $\pi_{AA} \equiv \pi_{BB}$ and identity loss from mis-coordination d

The payoff functions $\pi_{AA} \equiv \pi_{BB}$ corresponding to the same type match represents a pure coordination game. A miscoordination leads to a loss equivalent to "d'' for both the players called the "identity loss". Identity has been an important phenomenon in the economics literature in the last decade. It has been shown that group identity has an important influence on individual behavior (Akerlof & Kranton 2000), social preferences (Chen & Li 2009), in group bias (Kranton & Sanders 2017), social conflict (Huettel & Kranton 2012). Identity here is associated with an individual's cultural type, and to what extent his/her actions correspond to the norm prescribed behavior of own type. For example, if the norm prescribed behavior is to wear a veil, then both wearing a veil pareto dominates both not wearing a veil, and opposite actions lead to identity confusion

3 The cost function can be thought of as an aggregate cost C and $c = \frac{C}{N-1}$ so that the aggregate of the costs is C and since the stage game payoff is normalized to the number of players, we still get c in the stage game payoff.

4 This is an individual cost for embracing or adjusting to the other culture and is paid at the beginning of the stage game. For simplicity I take the average of this cost c and it enters the individual matches payoffs considered at the beginning of the stage game to calculate the expected payoffs.

5 n earlier models, this is the cost of switching to the new culture and the actions are associated with either own culture or other culture. However, this is not able to capture the gains from diversity which can only take place if the two cultures are maintained and cultural hybridization includes traits from both the cultures involved.

Table 1.2: Example of same type pairwise interaction with weak and strong identity

c=0.2						
d=0.1				d=0.5		
weak identity, α				strong identity, β		
	r	e			r	e
r	1 1	0.9 0.7		r	1 1	0.5 0.3
e	0.7 0.9	0.8 0.8		e	0.3 0.5	0.8 0.8

for both players. In this model, the norm prescribed behavior is endogenous, that is each player chooses to be as close as possible to the average action of his/her type to minimize the loss form miscoordination. The model also considers the strength of these sanctions from non-conformity. For instance, in some cultures going against the norm leads to being outcast from the group however in some cultures the sanctions could be as strong as honor killings. The payoff function from a single AA or BB match is shown in tabular form in the left panel of table 1.1. This is a pure coordination game with two pure strategy and one mixed strategy Nash equilibrium. The pure strategy equilibria are symmetric where both the players either choose to embrace or choose to reject. The mixed strategy Nash equilibrium is where both the players randomize between embracing with probability $\frac{d+c}{2d}$ and rejecting with probability $\frac{d-c}{2d}$. Under a same type match, maintaining own cultural norms Pareto dominates, that is playing reject dominates adjusting to the other culture or embracing since there is no individual cost of playing the mixed strategy Nash equilibrium.

To capture the effects of weak or strong sanctions, I assume two possible values of the parameter $d \in \{0.1, 0.5\}$.[6] The game with the two possible values of the parameter is shown in Table 1.2 where the profile α is for weak identity and the profile β is for strong identity. The two values of the identity loss also show when the identity loss is lower and higher than the costs to embrace ($c = 0.2$).

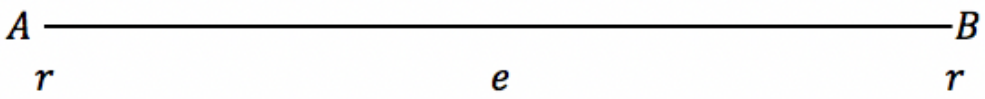
Payoffs from a single match of different type players $\pi_{AB} \equiv \pi_{BA}$ and gain/loss from cooperation 'g'

The payoff functions $\pi_{AB} \equiv \pi_{BA}$ corresponding to the different type matches are depen-

6 Although this is symmetric across players in a single match, the aggregate at the end of each round would differ for a deviation form the average action representing the weak and strong sanctions like getting outcast or honor killings form the rest of the population.

dent on how distant the two players are on the norm scale in Figure 1.2.[7] That is if both the players choose own norms by rejecting, the individuals are at the maximum distance from each other leading to a lower payoff by the parameter g. If either of the players cooperates by embracing there is no extra loss to either of the players, however if both the players cooperate there are gains to both the players by the same parameter g. The corresponding game is shown above in the right panel of Table 1.1.

Figure 1.2: Norm scale



The norm scale representing the differences between the norm prescribed actions of two types A and B.

The gains and losses explained by the parameter g are best predicted by the relative fit between the acculturation preferences of the two cultures in particular societal contexts (Interactive Acculturation Model (Bourhis et al. 1997) or Concordance Model of Acculturation (Piontkowski et al. 2002) and the corresponding adaptation outcomes in terms of acculturative stress, mental and physical health, well-being, creativity, innovation etc. The different outcomes can be divided into four multicultural ideologies that may exist in a culturally diverse society based on the acculturation preferences of individuals. These are: fragmented pluralism or segregation, interactive pluralism or integration, homogenization or melting pot of cultures or assimilation and accommodation by the majority. I make the different possible outcomes of a pairwise match of different match parallel to the multicultural ideologies as shown in Table 1.3. The function g is defined to make the payoff structure parallel to the graphic equivalent of the payoffs from these multicultural ideologies which places interactive pluralism on one end of the continuum and fragmented pluralism on the other.

The multicultural ideologies are based on the attitudes of the individuals towards other cultures. If none of the players embraces the other culture, it leads to segregation. It focuses on the existence of distinctive and relatively self-contained mediating communities, where conformity pressures are group specific with value systems between groups being

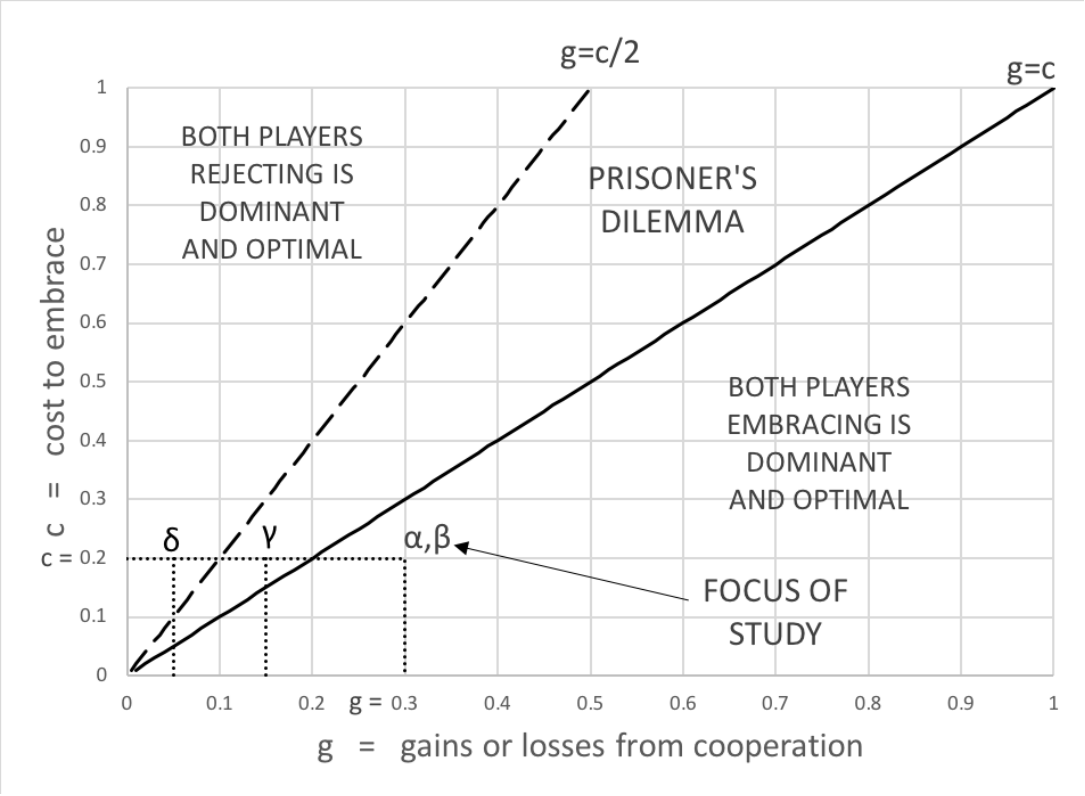
7 Figure 1.2 shows the norm scale with the extreme points of the norm scale being the norms of the two types and the length of the norm scale represents how different the norms of the two types are and how difficult it is to adjust.

Table 1.3: Multicultural ideologies based on the outcomes of the game

		$i \in B$ Majority	
		reject	embrace
$i \in A$ Minority	reject	Segregation	Accommodation
	embrace	Assimilation	Integration

divergent or in some cases directly opposed (Hartmann & Gerteis 2005). This leads to a loss in payoff as shown in the payoff function as it increases the stress, worse psychological outcomes and the possibility of conflict in the society. If only one of the type members embraces for instance if only the minority embraces and the majority rejects, the minority feels more assimilated in the majority and the mainstream culture leading to better job prospects, and labor market integration and the society benefits from societal cohesion, peace harmony and less stress. This leads to assimilationism or a melting pot where the differences between cultures are eliminated or minimized emphasizing on cultural homogeneity and conformity. Assimilation leads individuals to shed their previous markers of group identity and adopt the society's core values (Hartmann & Gerteis 2005; Schlesinger 1993). As much as the assimilating individuals benefit from assimilation, being low on cultural maintenance and no cooperation from the majority leads to anxiety and stress amongst the acculturating individuals. Also, the majority foregoes the possible benefits from other cultures. For example, the practice of yoga and the Ayurveda treatment has proven to be as beneficial as the allopathic treatment based on scientific trials. Therefore, assimilation leads to a net gain of zero as also assumed in the payoff function. If there is cooperation from both the players, the benefits from integration can be maximized as bicultural environment leads to the best adaptation outcomes in terms of low levels of stress and better psychological and societal

Figure 1.3: Nature of different type match game



This is based on the different combinations of parameters gains from integration(parameter g) and cost to embrace (parameter c)

outcomes (Berry 1989; Schwartz & Zamboanga 2008). This leads to interactive pluralism or cultural integration which prioritizes the role of groups (both majority and minority), along with stressing groups-in-interaction facilitating societal cohesion and harmony (Alexander 2001; Taylor 2001). For example, recent studies from adolescent psychologists like Ann Hagel shows that in the UK part of the reduction in teenage drinking, smoking and premarital sex can be attributed to strong inflow of immigrants from Africa, south Asia and eastern Europe who come from different cultural norms and strong taboos against drinking, premarital sex and smoking.[8] This is associated with a net gain as shown in the payoff function.

I assume that the gain and loss when both players reject or embrace respectively are symmetric and defined by the parameter g. The different type match payoff can take different forms of games based on the relationship between the two parameters c and

8 For details look at the article "The youth of today: Teenagers are better behaved and less hedonistic nowadays" in The Economist.

Table 1.4: Examples of different type pairwise interaction with different possible values of gains from integration

DIFFERENT TYPES MATCH $\pi_{AB}\,(\pi_{BA})$									
$c = 0.2$									
ee is dominant and Pareto optimal			Prisoner's dilemma			rr is dominant and Pareto optimal			
$g = 0.3, (\alpha, \beta)$			$g = 0.15(\gamma)$			$g = 0.05(\delta)$			
	r	e		r	e		r	e	
r	0.7 0.7	1 0.8	r	<u>0.85</u> <u>0.85</u>	1 0.8	r	**<u>0.95</u>** **<u>0.95</u>**	1 0.8	
e	0.8 1	**<u>1.1</u>** **<u>1.1</u>**	r	0.8 1	**0.95** **0.95**	r	0.8 1	0.85 0.85	

The four profiles are with different values of parameters where:

$c = 0.2, d = 0.1, g = 0.3$ under profile α

$c = 0.2, d = 0.5, g = 0.3$ under profile β

$c = 0.2, d \in [0, 1], g = 0.15$ under profile γ

$c = 0.2, d \in [0, 1], g = 0.0.05$ under profile δ

g as shown in Figure 1.3. An example of each of the game is shown in Table 1.4. If the value of the parameter g lies in the interval $\left[0, \frac{c}{2}\right]$ rejecting by both the players is strictly dominant and the Pareto optimal outcome. If g lies in the interval $\left(\frac{c}{2}, c\right]$, mutual rejection is dominant however mutual adaptation is the Pareto optimal outcome similar to games like prisoners dilemma. If g lies in the interval $(c, 1]$, mutual adaptation is both dominant and Pareto optimal outcome. The underlined cells in Table 1.4 show the dominant outcome and the bold cells show the optimal outcome.

Researchers in social psychology contend that interactive pluralism/integration as compared to the other multicultural ideologies is the most ideal, leading to greater benefits in all areas of life (Berry 1997). Most studies show that the combination of a strong ethnic identity and a strong national identity promotes the best adaptation (Phinney et al. 2001). However, if the dominant groups' acculturation attitudes do not match with acculturating individuals' attitudes, it may influence an individual's psychological and social well-being, and in-turn conflicts and problems in inter-group relations may arise (Bourhis et al. 1997; Jasinskaja-Lahti et al. 2003). To keep the model in line with the social psychology literature, I take the value of g to be in the interval $(c, 1]$ such that "ee" is the dominant and Pareto optimal outcome representing integration.

To summarize the model, each player $i \in N$ has a given type $k \in A, B$. In a stage game, a player of type k chooses an action $a_i \in \{e, r\}$ where action e has a cost and action r has no cost. Players have full information about the share of the two types in the population but do not know the strategies adopted by the other players. Every player $i \in N$ is then matched with every player $j \neq i \in N$. The action is taken at the beginning of the stage game before the matching process and it cannot be adjusted or changed until all the matches are complete. Players receive payoffs at the end of the stage game. The payoff for player i is dependent on i's type, i's action and the actions of all the other players in the population and the parameters of the model.

The two profiles of the parameters that are being used in this paper and in the simulations are α and β as shown in the Table 1.5. The corresponding tables for the payoffs for same and different matches are shown in Tables 1.6 and 1.7. I also show the simulations for the other two profiles γ and δ in the appendix, however our focus in this paper is on α and β profiles showing varying degrees of identity keeping the payoff structures in line with the previous research in social psychology.

In the next sub-section, I characterize the Nash equilibria for a stage game assuming perfect information about others actions. I show the equilibrium for both sets of parameter combinations α and β. Since it is difficult to analytically find the Nash equilibrium

Table 1.5: Examples of different type pairwise interaction with different possible values of gains from integration

Values of parameters for simulations				
	α *Weak identity*	β *Strong identity*	γ = *Prisoner's dilemma*	δ = *rr dominant and optimal*
c	0.2	0.2	$c \in [0,1]$	$c \in [0,1]$
d	0.1	0.5	$d \in [0,1]$	$d \in [0,1]$
g	0.3	0.3	0.15	0.05

Table 1.6: Payoffs in a pairwise match with weak identity (profile α)

SAME TYPE MATCH $\pi_{AA}(\pi_{AB})$		Minority A (Majority B) r	Minority A (Majority B) e		DIFFERENT TYPE MATCH $\pi_{AB}(\pi_{BA})$		Majority B (Minority A) r	Majority B (Minority A) e
Minority A (Majority B)	r	1 1	0.9 0.7		Minority A (Majority B)	r	0.7 0.7	1 0.8
	e	0.7 0.9	0.8 0.8			e	0.8 1	1.1 1.1

Table 1.7: Payoffs in a pairwise match with strong identity (profile β)

SAME TYPE MATCH $\pi_{AA}(\pi_{AB})$		Minority A (Majority B) r	Minority A (Majority B) e		DIFFERENT TYPE MATCH $\pi_{AB}(\pi_{BA})$		Majority B (Minority A) r	Majority B (Minority A) e
Minority A (Majority B)	r	1 1	0.5 0.3		Minority A (Majority B)	r	0.7 0.7	1 0.8
	e	0.3 0.5	0.8 0.8			e	0.8 1	1.1 1.1

for repeated stage games with imperfect information about others' actions, I show the equilibrium convergence for repeated stage games with random initial beliefs about the choices of other players in a simulation exercise in section 5.

Nash Equilibria

This section provides the basic theoretical results for a single round of a stage game assuming perfect information about the actions of the other players. The equilibrium for repeated stage games is shown in the section with simulations where players have imperfect information about the actions of the other players and update their beliefs after every round of a stage game.

In a stage game, the strategy profile $(s_1^*, s_2^*, \ldots, s_N^*)$ is a Nash equilibrium if $\Pi_{i\in k}\left(s_i^*, s_{-i}^*\right) \geq \Pi_{i\in k}\left(s_i, s_{-i}^*\right)$ for all $i \in N$ and for all $s_i \in S_i$.

Assume $i \in k$ needs to choose an action and q_k^S share of players of its own type are embracing and $(1-q_k^S)$ are rejecting. Similarly, q_k^O share of the other type are embracing and $(1-q_k^S)$ are rejecting. Given these proportions, player $i \in k$ tries to maximize his/her expected payoff form a stage game given by

$$\begin{aligned} E\left(\Pi_{i\in k}\left(a_i\right)\right) =& q_k^S\left(\frac{N_k-1}{N-1}\right)\pi_{k(k'=k)}\left(a_i,e\right)+\left(1-q_k^S\right)\left(\frac{N_k-1}{N-1}\right)\pi_{k(k'=k)}\left(a_i,r\right) \\ &+ q_k^o\left(\frac{N-N_k}{N-1}\right)\pi_{k(k'\neq k)}\left(a_i,e\right)+\left(1-q_k^o\right)\left(\frac{N-N_k}{N-1}\right)\pi_{k(k'\neq k)}\left(a_i,r\right) \end{aligned} \tag{1.5}$$

The player chooses an action $a_i \in \{e, r\}$ that maximizes his/her payoff and the following proposition follows:

Proposition 1

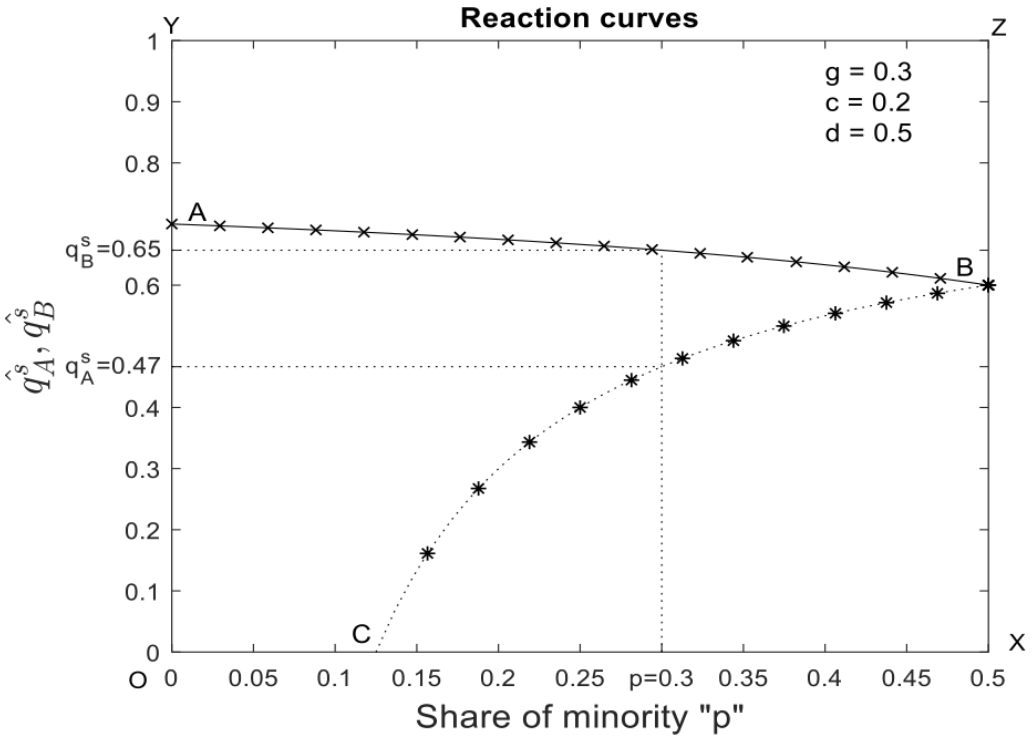
For a given profile of parameters and a share of the minority

1. There exists a threshold $\widehat{q_A^S} = \frac{N(1-P)}{Np-1}\left[\frac{c-g}{2d}\right] + \frac{c+d}{2d}$ such that player $i \in A$ embraces if $q_i^s > \widehat{q_A}$, randomizes between embracing or rejecting if $q_A^s = \widehat{q_A^S}$ and rejects if $q_A^s < \widehat{q_A}$.
2. There exists a threshold $\widehat{q_B^S} = \frac{NP}{(1-p)N-1}\left[\frac{c-g}{2d}\right] + \frac{c+d}{2d}$ such that player $i \in B$ embraces if $q_i^s > \widehat{q}_B^s$, randomizes between embracing or rejecting if $q_i^s = \widehat{q_B^S}$ and rejects if $q_i^s < \widehat{q}_B^s$.

Proposition 1 states that it is only the proportion of the same type embracing or rejecting that affects the choice of a player to embrace or reject. That is, a player tends to minimize

miscoordination with its own types and not maximizing cooperation with the other types. Figure 1.4 shows the change in the two thresholds as the share of minority changes.

Figure 1.4: Reaction curves



The reaction curves of minority (A) represented by the dotted starred line BC and majority (B) represented by the 'solid-x' line AB.

Figure 1.4 shows how the threshold for the two types for embracing or rejecting changes as the share of minority changes. That is, if the share of the minority is $p = 0.3$, then for a player $i \in A$ to embrace at least 47% of the players of type A should embrace denoted by $\widehat{q_A}^S = 0.47$. Similarly, for a player $i \in B$ to embrace, at least 65% of the players of type B should embrace denoted by $\widehat{q_B}^S = 0.65$. The lines BC and AB for the minority A and majority B are the reaction curves showing that the players randomize between embracing or rejecting if the share of the own type embracing is exactly equal to the threshold.

The figure also shows that there are multiple Nash equilibria, that is any combinations of qA^S and qB^S such that $q_A^S \in \left\{0, 1, \widehat{q_A^S}\right\}$ and $q_B^S \in \left\{0, 1, \widehat{q_B^S}\right\}$ is a Nash equilibrium of the game. To define the multicultural ideologies of the society, I define four pure strategy Nash equilibria which are the corner solutions of Figure 1.4 that is both $q_A^S, q_B^S \in \{0, 1\}$ and five mixed strategy Nash equilibria where at least one of the two conditions $q_A^s = \widehat{q}_A^S, \forall i \in A$

or $q_B^S = \widehat{q_B^S}, \forall i \in B$ is satisfied. In this paper, I concentrate only on the pure strategy Nash equilibria since the pure strategy Nash equilibria are stable however, mixed strategy Nash equilibria would tend to converge to one of the pure strategy Nash equilibrium in the repeated rounds of the stage game as shown in the next section on simulations. The pure strategy Nash equilibria and the multicultural ideologies corresponding to the actions of the two types are shown in Table 1.8. A state $(s_1, s_2, \ldots, s_N)$ is defined as

1. Integration (EE): If all the players of both types embrace that is $a_i = e \forall i \in N$, that is $q_A^S = q_B^S = 1$ and there is mutual adaptation from both the types.
2. Assimilation (ER): If all players belonging to the minority embrace and all the individuals belonging to the majority reject, that is $a_i = e \forall i \in A$ and $a_i = r \forall i \in B$, that is $q_A^S = 1$ and $q_B^S = 0$.
3. Accommodation (RE): If all players belonging to the majority embrace and all the individuals belonging to the minority reject, that is $a_i = r \forall i \in A$ and $a_i = e \forall i \in B$, that is $q_A^S = 0$ and $q_B^S = 1$.
4. Segregation (RR): If all the players of both types reject that is $a_i = e \forall i \in N$, that is $q_A^S = q_B^S = 0$, both the minority and the majority reject by taking their preferred actions and do not adjust to the other type.

Table 1.8: Payoffs of player i under pure strategy Nash equilibria

		Every player $i \in B$ (Majority)	
		r	e
Every player $i \in A$ (Minority)	r	RR (Segregation) $\Pi_{i \in B} = 1 - \frac{N}{N-1}(1-p)g$ $\Pi_{i \in B} = 1 - \frac{N}{N-1}pg$	RE (Accommodation) $\Pi_{i \in A} = 1$ $\Pi_{i \in B} = 1 - c$
	e	ER (Assimilation) $\Pi_{i \in A} = 1 - c$ $\Pi_{i \in B} = 1$	EE (Integration) $\Pi_{i \in A} = 1 - c + \frac{N}{N-1}(1-p)g$ $\Pi_{i \in B} = 1 - c + \frac{N}{N-1}pg$

Notice from Tables 1.6 and 1.7 , for the two profiles α and β, the dominant strategies are different in the pairwise matches of same and different types. For AB (BA) matches ee is the dominant strategy whereas for AA (BB) matches rr is the dominant strategy. Since a player gets matched with all the other players in the population and the action once taken cannot be adjusted until the next round of the stage game, a player's action is dependent on what the other players of his/her type are doing and the share of the two types in the population defined by the parameters p and d.

I examine the pure strategy Nash equilibria defined by the thresholds based on the two parameters p and d, and the exogeneous parameters c and g. For the same type match, the Nash equilibrium is the dominant strategy rr whereas the Nash equilibrium for the different type pairwise match is the dominant strategy ee.

Proposition 2: Existence

1. EE is an equilibrium if and only if for both types the loss in payoff from rejecting for a player is greater than the gain from not paying the cost to embrace minus the forgone gains (from the other type) that is

$$d(pN-1) \geq c(N-1) - Ng(1-p) \text{ for type } A$$

$$d\{(1-p)N-1\} \geq c(N-1) - Ngp \quad \text{for type } B$$

2. ER is an equilibrium if and only if

   a) For minority type A, the loss in payoff from rejecting for a player is greater than the gain from not paying the cost minus the losses due to stress (from the other type)

$$d(pN-1) \geq c(N-1) - Ng(1-p)$$

   b) For majority type B, the loss in payoff from embracing for a player is greater than the net gain

$$d\{(1-p)N-1\} \geq Ngp - c(N-1)$$

3. RE is an equilibrium if and only if

   a) For minority type A, the loss in payoff from embracing for a player is greater than the net gain

$$d(pN-1) \geq Ng(1-p) - c(N-1)$$

b) For majority type B, the loss in payoff from rejecting for a player is greater than the gain from not paying the cost minus the losses due to stress (from the other type)

$$d\{(1-p)N-1\} \geq c(N-1) - Ngp$$

4. RR is an equilibrium if and only if, for both types, the loss in payoff from embracing for a player is greater than the gain from avoiding the stress (from the other type) minus the cost of embracing

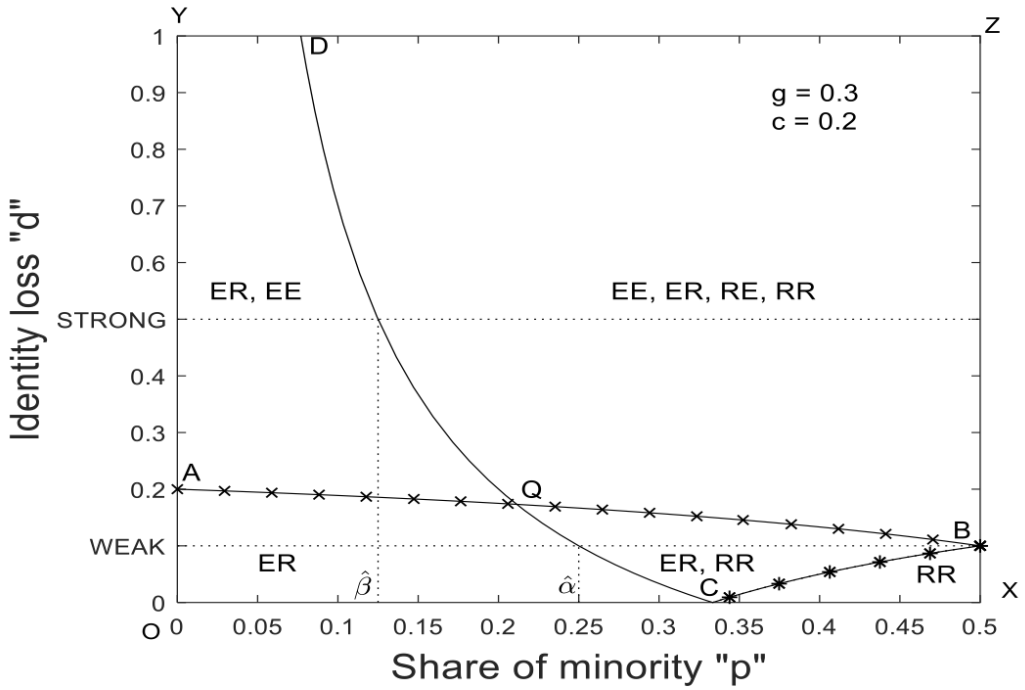
$$d(pN-1) \geq Ng(1-p) - c(N-1) \text{ for type } A$$

$$d\{(1-p)N-1\} \geq Ngp - c(N-1) \text{ for type } B$$

The necessary conditions for the pure strategy Nash equilibria above can best be explained taking specific values for the parameters and when N approaches infinity. I show the equilibrium when $g = 0.3$ and $c = 0.2$ for all possible values of d and p shown in Figure 1.5. The figure also shows the two profiles α and β.

Figure 1.5 shows the necessary conditions for the pure strategy Nash equilibria for different combinations of p and d. The figure shows the proportion of the minority p on the x axis and the identity loss d on the y axis. For example, for strong identity i.e., $d = 0.5$ shown by the black horizontal line, until $p < \hat{\beta} \equiv \frac{1}{8}$, ER and EE satisfy the necessary conditions, and if the proportion of minority is higher all EE,RE,ER and RR satisfy the necessary conditions. Whereas if the identity is weak i.e., $d = 0.1$, for $p < \hat{\alpha} \equiv \frac{1}{4}$, ER is the unique equilibirum, and for higher proportion ER and RR satisfy the necessary conditions for Nash equilibria in proposition 2.

Figure 1.5: Multiple Nash equilibria for strong and weak identity profiles



Multiple Nash equilibria for profiles α and β with weak and strong identity. The areas in the graph are labeled with the Nash equilibria that satisfy the necessary conditions.

Table 1.9: Thresholds for weak identity, α and weak identity, β.

Thresholds	*WEAK IDENTITY* α $\{c = 0.2, d = 0.1, g = 0.3\}$	*STRONG IDENTITY* β $\{c = 0.2, d = 0.5, g = 0.3\}$
$\widehat{p_{EE}}$	$p \geq 0.5$	$p \leq 1.5$
$\widehat{p_{ER}}$	$p \leq 0.5$	$p \geq -0.5$
$\widehat{p_{RE}}$	$p \geq 0.5$	$p \geq 0.125 \equiv \hat{\beta}$
$\widehat{p_{RR}}$	$p \geq 0.25 \equiv \hat{\alpha}$	$p \geq 0.125 \equiv \hat{\beta}$

Corollary 1

With the parameter restrictions of $g \in [c, 1]$ the following corollary follows:

1. There exists a threshold $\widehat{p_{EE}} = (c - d)/(g - d)$ such that EE is an equilibrium iff

$$p \quad \begin{array}{ll} \geq & \widehat{p_{EE}} \quad \text{when } g > d \\ \leq & \widehat{p_{EE}} \quad \text{when } g \leq d \end{array}$$

2. There exists a threshold $\widehat{p_{ER}} = (g-c)/(g-d)$ such that ER is an equilibrium iff

$$p \begin{array}{ll} \leq & \widehat{p_{ER}} \quad \text{when } \widehat{p_{ER}} > 0 \\ \geq & 0 \quad \text{when } \widehat{p_{ER}} \leq 0 \end{array}$$

3. There exists a threshold $\widehat{p_{RR}} = (gN - c(N-1) + d)/N(g+d)$ such that RR is an equilibrium iff

$$p \geq \widehat{p_{RR}}$$

4. There exists a threshold $\widehat{p_{RE}} = \begin{array}{ll} \max\{p_{\hat{EE}}, \widehat{p_{RR}}\} & \text{when } g > d \\ \min\{p_{\hat{EE}}, p_{\hat{RR}}\} & \text{when } g \leq d \end{array}$ such that RE is an equilibrium iff

$$p \geq \widehat{p_{RE}} \tag{1.6}$$

Figure 1.5 and Table 1.9 show the thresholds for the two profiles α and β. Line AB shows the threshold line for EE to be an equilibrium. For a given value of identity loss, there exists a threshold $\widehat{p_{EE}}$ such that, EE is an equilibrium if and only if $p > \widehat{p_{EE}}$. Similarly, line BC is the threshold line for ER such that ER is an equilibrium if and only if p is less than the point on that line. DC shows the line for RR and line DQB shows the thresholds for RE to be an equilibrium. I show in the appendix the change in these areas based on the different values of g. The effects of this corollary would be clearer in the next section where I show the simulations for equilibrium convergence based on different beliefs of the two types.[9]

Social welfare function

The social welfare function is a simple utilitarian welfare function which is the sum of the payoffs of all the players in a stage game, that is

$$SW = \sum_{i \in N} u_i = \sum_{i \in N} \left(\left(\sum_{j \neq t \in N} \pi_{kk'}(a_i, a_j) \right) / (N-1) \right) \tag{1.7}$$

It is the sum of payoffs for all the players after a stage game. This sum is dependent on the actions of the players and the frequency of interactions in a stage game for each type

9 These areas in Figure 1.5 which show the existence of the Nash equilibria are also dependent on the degree of gains or the multiplication factors denoted by g and s assumed to be 0.3 in Figure 1.5, however figures A3, A4 and A5 shows how these areas change as the value of g and s changes.

of player as shown in Table 1.10. The table for the corresponding payoffs is shown in the appendix.

Table 1.10: Pure strategy Nash equilibria and the corresponding payoffs for the two types.

		j's type	
		A	B
i's type	A	$Np(Np-1)$	$pN(1-p)N$
	B	$N(1-p)pN)$	$(1-p)N[(1-p)N-1]$

Based on the frequencies, the social payoff function can be written as a sum of the individual payoffs under the respective Nash equilibria as:

$$SW = N\left\{p(Np-1)\pi_{AA} + (1-p)Np\pi_{BB} + Np(1-p)\pi_{AB} + (1-p)[(1-p)N-1]\pi_{BA}\right\} \tag{1.8}$$

Proposition 3

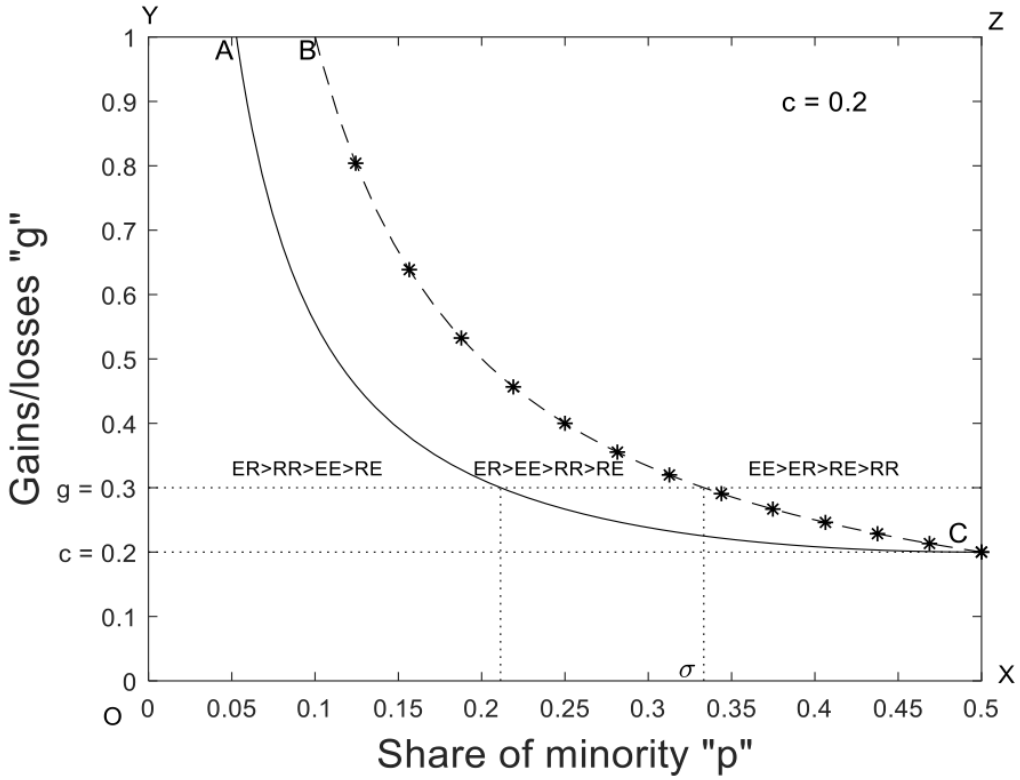
There exists threshold $\delta = \frac{c(N-1)}{2Ng}$ such that

1. It is socially optimal for both types to embrace if $p \geq \delta$.
2. It is socially optimal for type B to assimilate into type A if $p < \delta$.
3. It is never socially optimal to accommodate or segregate.

Notice that the socially optimal outcome is not affected by the identity loss d, since there is no within type miscoordination in the pure strategy Nash equilibria. Figure 1.6 shows the ranking of the pure strategy Nash equilibria based on the total surplus with $c = 0.2$ and varying g on the y axis and p on the x axis. For any combinations of the parameters p and g that fall in the area BCZ, EE is the socially optimal outcome otherwise ER is the socially optimal outcome. That is the minimum proportion of minority needed for integration to be socially optimal is one-third of the total population when $g = 0.3$ as shown by threshold δ. This threshold for EE being socially optimal is negatively related to the gains from EE, that is as the gains increase, the population threshold for EE being socially optimal decreases. The solid line AB in the graph shows the relationship between the second and the third best outcomes, EE and RR. Although the socially optimal outcome is for the minority to assimilate in the area OXCBY, EE is the second-best outcome only if the combination of the parameters p and g are in the area ACB.

This is important because, it would be important in interpreting the simulation results in the next section.

Figure 1.6: Ranking based on total surplus.



1.3 Equilibrium selection

As shown in the previous section, the game of cultural interaction is a game with multiple Nash equilibria. So which equilibrium outcome do we converge to and which outcomes are stable? In this section, I model the super-game which is the infinitely repeated rounds of the stage game. The Nash equilibria defined in the previous section assume that the players have perfect information or have the correct beliefs about the actions of the rest of the population and the Nash equilibria are assumed to be stable. However, players do not have the correct beliefs and tend to learn overtime and update beliefs based on their experiences. That is, a player might think that 80% of the population is embracing and takes an action that maximizes his/her payoff. After one round of the stage game, that is after the player is matched with everyone in the population and has realized his/her

payoff, the player updates his/her beliefs. Therefore, this section describes with imperfect information and random initial beliefs about the actions of the other players, which pure or mixed strategy Nash equilibrium do we converge to and whether it is stable or not.

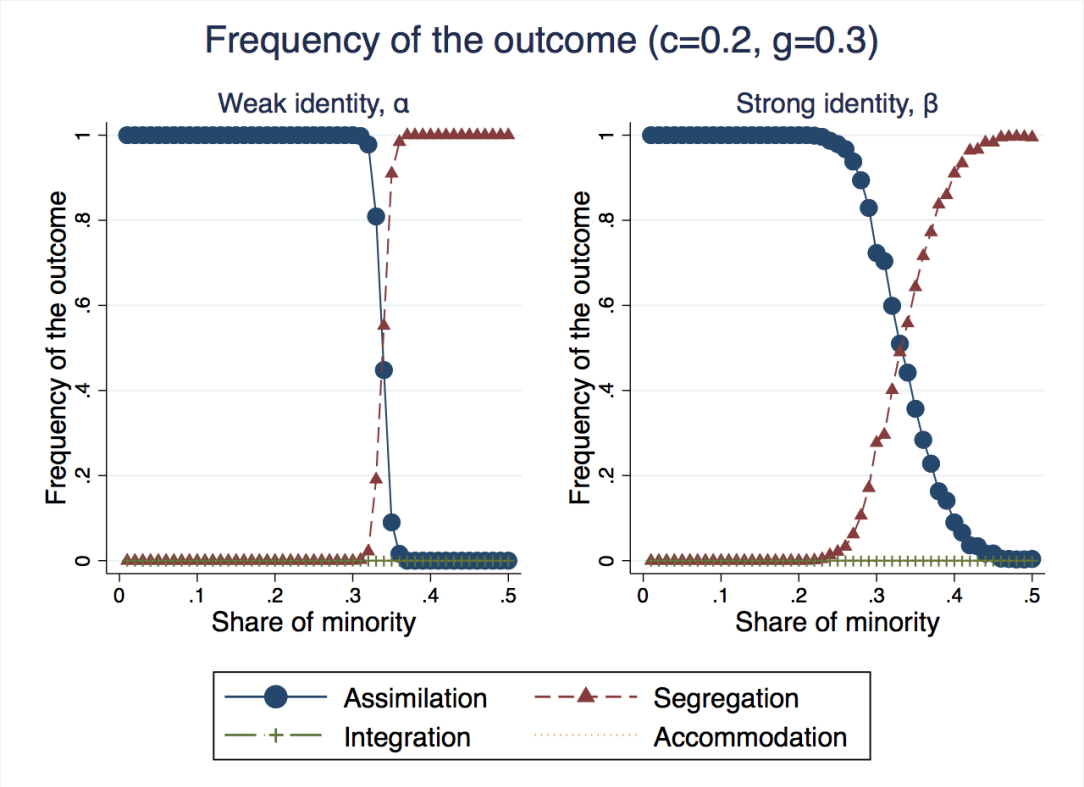
Given there are multiple Nash equilibria in a static environment, the best way to theoretically determine the equilibrium convergence is to run the model in a simulated dynamic environment. A simulation is where all the players have randomly distributed initial beliefs about the proportions of the same and different types embracing. A player has two sets of beliefs: about the proportion of the same type embracing and about the proportion of the other type embracing that is q_k^S and q_k^O respectively. These initial beliefs are randomly drawn from a uniform distribution on the interval $[0, 1]$.

Players are myopically rational and take the actions to maximize the expected payoffs of the current round based on the beliefs. After choosing the action, players are matched with everyone in the population. At the end of the first round of a stage game the players realize payoffs and update their beliefs about the choices of the other players. The learning rule that is being used in this analysis is fictitious play to update the beliefs. Then players play the next round of the stage game and take actions to maximize their expected payoffs based on the updated beliefs. This process is repeated infinitely until there is no change in the actions of the individuals from one round to the next round of the stage game that is the outcome is stable. An example of a simulation is shown in Figure 1.7.

Figure 1.7: Process for computerized simulations

I run 100000 of these simulations with random initial beliefs for every simulation to evaluate the likelihood of the outcome. Figure 1.9 shows the likelihood of the equilibrium outcome for the two profiles α and β. If the proportion of the minority is low, assimilation (ER) is the most likely outcome and as the proportion increases, the likelihood of segregation (RR) increases even though integration (EE) is the Pareto optimal outcome as shown in proposition 3 and figure 1.6. None of the mixed strategy Nash equilibria appear to be stable, that is the whole population always converges to an outcome where there is no mis-coordination within the same type. The degree of identity does not affect the outcome. With weak identity (α) there is an immediate jump from ER to RR however with strong identity (β) the transition from ER to RR as the share of minority increases is a smoother. But the outcome is still the same irrespective of the degree of identity.

Figure 1.8: Frequency of outcomes with weak and strong identity



The frequency of the outcomes with weak identity (α profile) and strong identity (β profile). The frequency is scaled down to the interval [0,1].

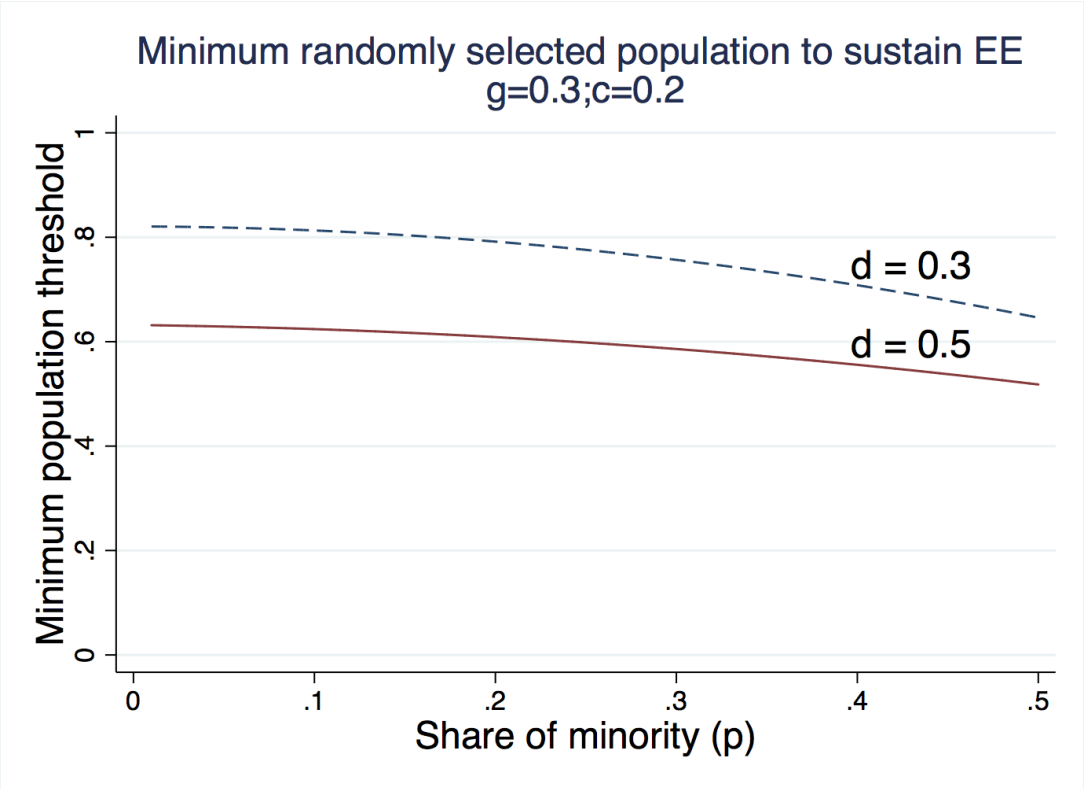
Can we improve the equilibrium outcome?

As shown in proposition 3, it is a Pareto improvement for both the minority and the majority to embrace and cooperate with each other especially when the share of the minority is higher. Than why do we converge to an outcome where both the types are rejecting and is there a way to sustain EE? The only way to improve the outcome is to update the players' beliefs about the actions of the other players. But do we have to inform everyone in the population or informing a selected proportion of the population could help sustain EE. To analyze this, I run simulations where I randomly pick players from the population and assign them with their initial beliefs such that there expected payoff from embracing is higher than rejecting. That is a proportion of players is picked randomly from the population to update their beliefs in such a way that embracing is the dominant strategy for them.

How many random players do we need to pass on this information to or how many players do we have to update the beliefs of? Figure 1.9 shows how we can sustain EE as

an equilibrium outcome. The figure shows the minimum proportion of randomly selected population needed to have updated beliefs such that the likelihood for EE to be stable is at least 90%. The dashed line is for $d = 0.3$ that is when the identity is in between α and β; and the solid line is with strong identity at the profile β. Since when the identity is weak at the profile α, EE cannot be an equilibrium so EE cannot be sustained at weak identity α since the necessary conditions are not satisfied. To show the effect of identity on this threshold, I use the average of the two profiles.

Figure 1.9: Stability of integration



The figure shows the minimum share of the total population to have a belief that mutual adaptation is socially optimal for integration to be stable.

The minimum proportion threshold is negatively related to both the share of the minority p and the group identity d. For instance, if the share of the minority is 0.3, we only need to update the beliefs of only 55% of the randomly selected players to sustain EE when the identity is strong and 73% of players when the identity is between strong and weak. Whereas when the share of minority is 0.4, this minimum threshold decreases to 53% and 70% respectively. This is very important for policy implications, since for strong group identity we need less people to be informed about the benefits of a multicultural society,

so they embrace the other culture. Secondly, a higher share of the minority makes it easier to attain a multicultural society given it is optimal, and one needs to have a lower proportion of population to be informed about the benefits and have their beliefs updated so that the socially optimal equilibrium is achieved.

1.4 Concluding remarks

With current levels of globalization and increasing levels of cultural diversity in the population, inter-cultural contact is inevitable. Given culture plays a very important role in explaining the behavioral patterns of individuals, inter-cultural contact has both positive and negative societal implications. The positive and negative outcomes are modeled into four societal structures which are based on the hybrid cultures that emerge from the intercultural contact. The first structure is integration which has aspects of both culturres leading to mostly positive outcomes in terms of innovation, creativity, cognitive complexity. The second outcome is assimilation where the minority assimilates into majority cultural practices which leads to low levels of conflict but also forgone gains from integration. The third outcome is accommodation, where the majority adapts into minority cultural practices which also leads to low levels of conflict and forgone gains although this leads to lower surplus as the cost of adjustment is paid by more individuals.The last possible structure is segregation which leads to worst possible outcome, with no gains from integration as well as a higher possibility of conflict and discrimination.

In this study I model these four outcomes in a cultural adaptation game and focus on two important factors that may affect the societal structure that emerges: the group identity and the group size. The main intuition behind the model and its parameters is that diversity is beneficial both at the individual and the societal level. However, one of the main drivers for these benefits to materialize is the multicultural ideologies adopted by the whole society (that is integration, assimilation, or segregation) which in turn is dependent on the acculturation strategies of all the individuals in the population. These acculturation strategies include embracing or rejecting the other culture. These acculturation strategies are affected by the group identity or the sanctions as the increase in the strength of group identity or increase in sanctions, it becomes more costly for an individual to go against what the group is doing. Similarly the proportions of the groups in the population also plays a crucial role as the cost of not coordinating with own group members increases and the benefits from cooperating with the other group members decreases with the proportion of own group members in the population.

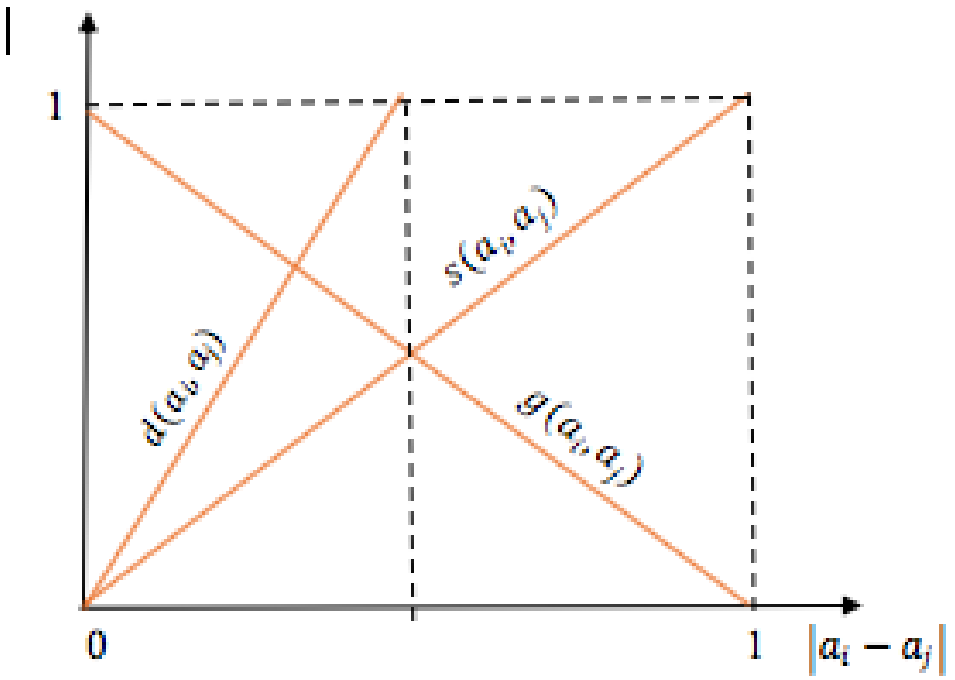
I model the four societal structures as the four pure strategy Nash equilibria that the model predicts where the actions of the individuals map exactly into the four forms of hybrid cultures: integration (mutual adaptation), assimilation (minority adapts), accommodation (majority adapts) and segregation (no one adapts). The model shows that with low levels of sanctions or weak identity and low share of minority in the population, assimilation is the unique pure strategy Nash equilibrium that may exist. However, as the strength of identity or the share of the minority increases the model predicts multiple pure strategy Nash equilibria where integration is the socially optimal equilibrium. The theory is not able to predict which equilibrium gets selected. To this I use computerized simulations to test the equilibrium selection. The simulations reveal that with low shares of minority, assimilation gets selected the most where the minority adapts to the majority culture. However, as the share of the minority increases, the likelihood of segregation, with both minority and majority not adapting with each other, increases even though mutual adaptation is socially optimal and it is also Pareto dominant. With current levels of shares of minority in the population which are continuously increasing, it is of extreme importance to understand how we can accrue the benefits from cultural diversity, to find policies which can help improve the cooperation between groups of different cultures so that we do not get stuck in a segregated society with low payoffs for everyone.

Appendix

1.A Explanation of parameters

The absolute value of the distance between the actions of individuals $i, j \in N$ on the x axis and the values of the three parameters on y axis. The functions $g(a_i, a_j)$ and $s(a_i, a_j)$ are based on the distance between the actions of the opposite types that is when $i \in k$ and $j \in -k$. Whereas the function $d(a_i, a_j)$ is the identity loss or the losses from non-conformity from the same types that is when both$i, j \in k$.

Figure 1.10: Parameters g,s, and d



Relationship between the norm scale and the parameters gains from integration(g), stress from segregation (s) and identity loss (d).

1.B Reasons for convergence

As shown in proposition 2, if it is a pareto improvement for both the minority and the majority to embrace especially when the share of the minority is higher, than why do

Table 1.11: Equilibrium and deviating payoff under pure strategy Nash equilibria.

Equilibrium	Type	Equilibrium payoff	Deviating payoff
EE	Minority	$(1-c)(pN-1)$ $+(1-c+g)(1-p)N$	$(1-d)(pN-1)$ $+(1-p)N$
	Majority	$((1-c)[(1-p)N-1]$ $+(1-c+g)Np$	$(1-d)[(1-p)N-1]+Np$
ER	Minority	$(1-c)(pN-1)$ $+(1-c)(1-p)N$	$(1-d)(pN-1)$ $+(1-g)(1-p)N$
	Majority	$(1-p)N-1+Np$	$(1-c-d)[(1-p)N-1]$ $+(1-c+g)Np$
RE	Minority	$pN-1+(1-p)N$	$(1-c-d)(pN-1)$ $+(1-p)N(1-c)$
	Majority	$(1-c)[(1-p)N-1]$ $+(1-c)Np$	$(1-d)[(1-p)N-1]$ $+(1-g)Np$
RR	Minority	$pN-1+(1-g)(1-p)N$	$(1-c-d)(pN-1)$ $+(1-p)N(1-c)$
	Majority	$(1-p)N-1+(1-g)Np$	$(1-c-d)[(1-p)N-1]$ $+(1-c)Np$

Table 1.12: Equilibrium conditions.

Equilibrium	Type	Conditions
EE	Minority	$d \geq \dfrac{c(N-1)-Ng(1-p)}{pN-1}$
	Majority	$d \geq \dfrac{c(N-1)-Ngp}{(1-p)N-1}$
ER	Minority	$d \geq \dfrac{c(N-1)-Ng(1-p)}{pN-1}$
	Majority	$d \geq \dfrac{Ngp-c(N-1)}{(1-p)N-1}$
RE	Minority	$d \geq \dfrac{gN(1-p)-c(N-1)}{pN-1}$
	Majority	$d \geq \dfrac{c(N-1)-Ngp}{(1-p)N-1}$
RR	Minority	$d \geq \dfrac{Ng(1-p)-c(N-1)}{pN-1}$
	Majority	$d \geq \dfrac{Ngp-c(N-1)}{(1-p)N-1}$

Table 1.13: Total surplus under pure strategy Nash equilibria.

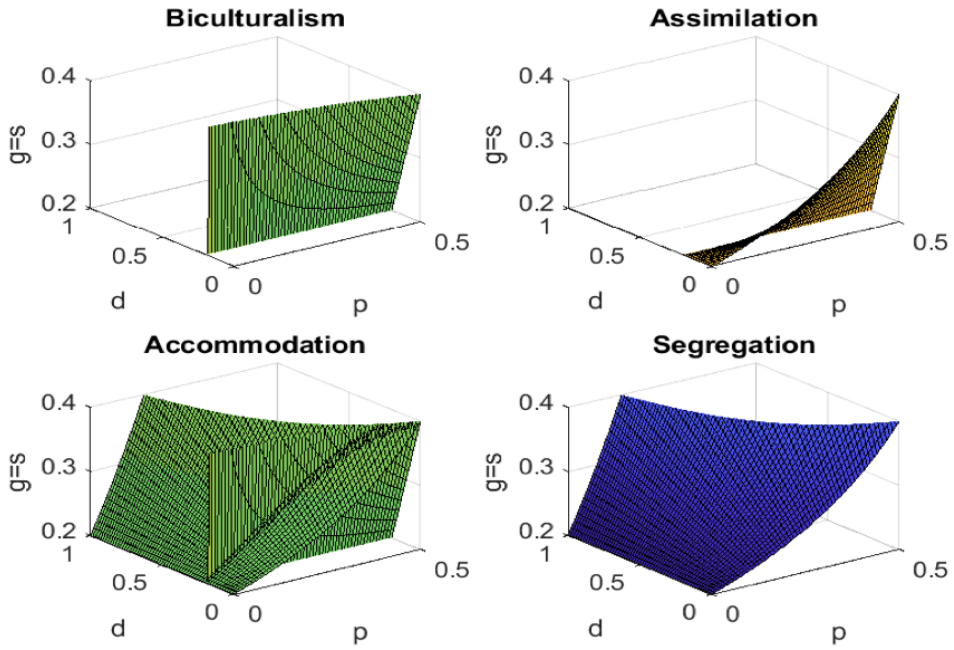
Equilibrium	Total surplus
EE	$N\left\{\begin{array}{c} p[(1-c)(pN-1)+(1-c+g)(1-p)N] \\ +(1-p)[(1-c)[(1-p)N-1]+(1-c+g)Np] \end{array}\right\}$
ER	$N\left\{\begin{array}{l} p[(1-c)(pN-1)+(1-c)(1-p)N] \\ +(1-p)[(1)[(1-p)N-1]+(1)Np]\} \end{array}\right.$
RE	$N\left\{\begin{array}{c} p[(1)(pN-1)+(1)(1-p)N] \\ +(1-p)[(1-c)[(1-p)N-1]+(1-c)Np] \end{array}\right\}$
RR	$N\left\{\begin{array}{c} p[(1)(pN-1)+(1-g)(1-p)N] \\ +(1-p)[(1)[(1-p)N-1]+(1-g)Np] \end{array}\right\}$

Table 1.14: Thresholds for surplus under different Nash equilibria.

Equilibrium	Total surplus
$EE > ER$	$g \geq \frac{c(N-1)}{2Np}$
$EE > RE$	$g \geq \frac{c(N-1)}{2N(1-p)}$
$EE > RR$	$2g \geq \frac{c(N-1)}{2Np(1-P)}$
$ER > RR$	$g \geq \frac{c(N-1)}{2N(1-p)}$
$RE > RR$	$g \geq \frac{c(N-1)}{2Np}$
$ER > RE$	$g \geq \frac{c(N-1)}{2N(1-p)}$

we converge to an outcome where both the types are rejecting? Why does the minority always assimilate even though there can be a higher payoff for the minority and socially for both the types to cooperate with each other? These outcomes shown in figure 8 can be explained by the ranking of the payoffs under the respective outcomes.

Figure 1.11: Necessary conditions for Nash equilibria



The 3-dimensional plot with the minority proportion p on the x axis, identity loss d on the y axis, and the multiplication factor $g \equiv s$ on the z axis. The cost is assumed to be 0.2, so the z axis that is the multiplication factors $g \equiv s \in [0.2, 0.4]$. The graph sows that as the multiplication factors change how the area of the necessary conditions for the Nash equilibria change.

1.C Individual payoffs from different outcomes

With threshold $\sigma = \frac{c}{2g}$, the preference relation based on the payoffs for pure strategy Nash equilibria is:

The table shows the ranking of the payoffs for individuals. For the simulations we assume the value of $g = 0.3$ which makes $\sigma = \frac{1}{3}$. The minority and the majority ranking for the individual payoffs under a pure strategy Nash equilibrium are shown in Figure 1.12 respectively. Irrespective of the proportion of the minority, the majority,Äôs most preferred

Table 1.15: Preference relation for a player i based on payoffs under all pure strategy Nash equilibria.

Type	Condition	Ranking of Nash equilibria based on the payoffs
$\forall i \in A$	$p \geq 1 - 2\sigma$	$RE > EE > RR > ER$
	$p < 1 - 2\sigma$	$EE > RE > ER > RR$
$\forall i \in B$	$p \geq 2\sigma$	$EE > ER > RE > RR$
	$\sigma \leq p < 2\sigma$	$ER > EE > RR > RE$
	$p < \sigma$	$ER > RR > EE > RE$

equilibrium is ER (assimilation) and the least preferred equilibrium is RE (accommodation) as shown in the left panel of Figure 1.12. However, the preference ordering for the 2nd most preferred and the 3rd most preferred equilibrium out of the four equilibria are dependent on the threshold $\sigma = \frac{c}{2s} = \frac{c}{2s}$. This threshold is depicted by the line AX in the left panel. For any combinations of the multiplication factors and the minority proportion above this threshold line, that is area AXZ, the majority prefers integration over segregation and in the area OXAY, the majority prefers segregation over integration. This ranking of the 2nd and the 3rd most preferred equilibrium for the majority has important implications for equilibrium convergence, since for any combinations of the two parameters falling in the area OXAY, the majority prefers to reject irrespective of the actions of the minority which increases the likelihood of converging towards assimilation. Similarly, the minority always prefers integration to both segregation and assimilation whatever the values of the parameters are since the gains from integration are high enough to offset the costs. However, if the share of the minority is high in the total population as depicted by the area OXZ, then the minority prefers accommodation to integration, otherwise integration is the most preferred equilibrium for the minority. This leads to a segregated society when the proportion of the minority is high, since both the minority and the majority prefer the other type to embrace leading to a third ranked equilibrium for both the majority and the minority. Also, this is also the worst possible outcome for the society.

Figure 1.12: Payoff relationship for pure strategy Nash equilibria for minority and majority

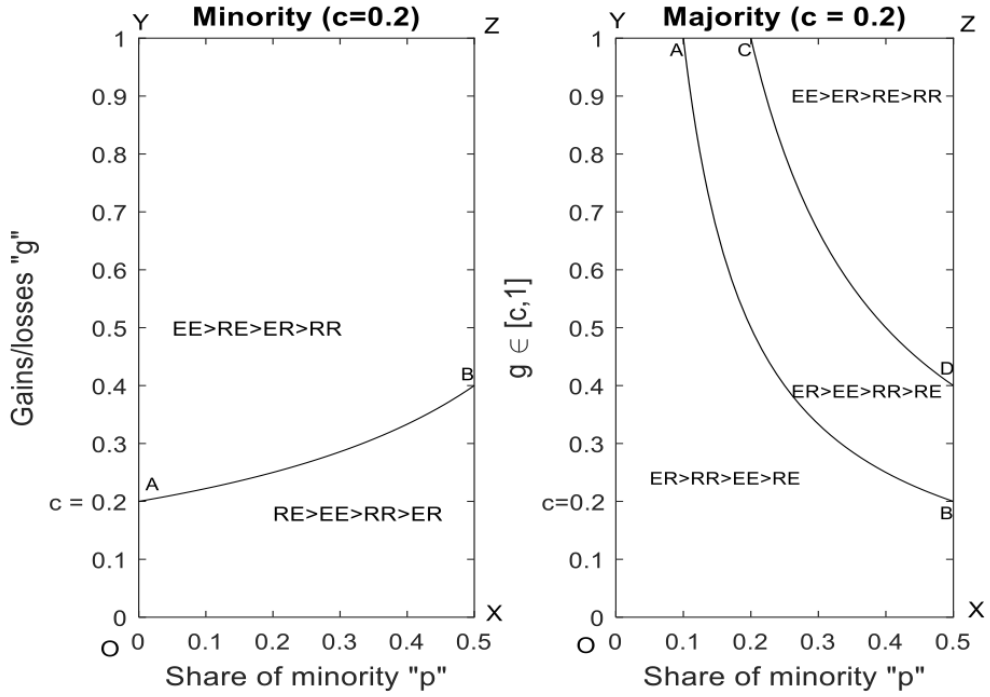
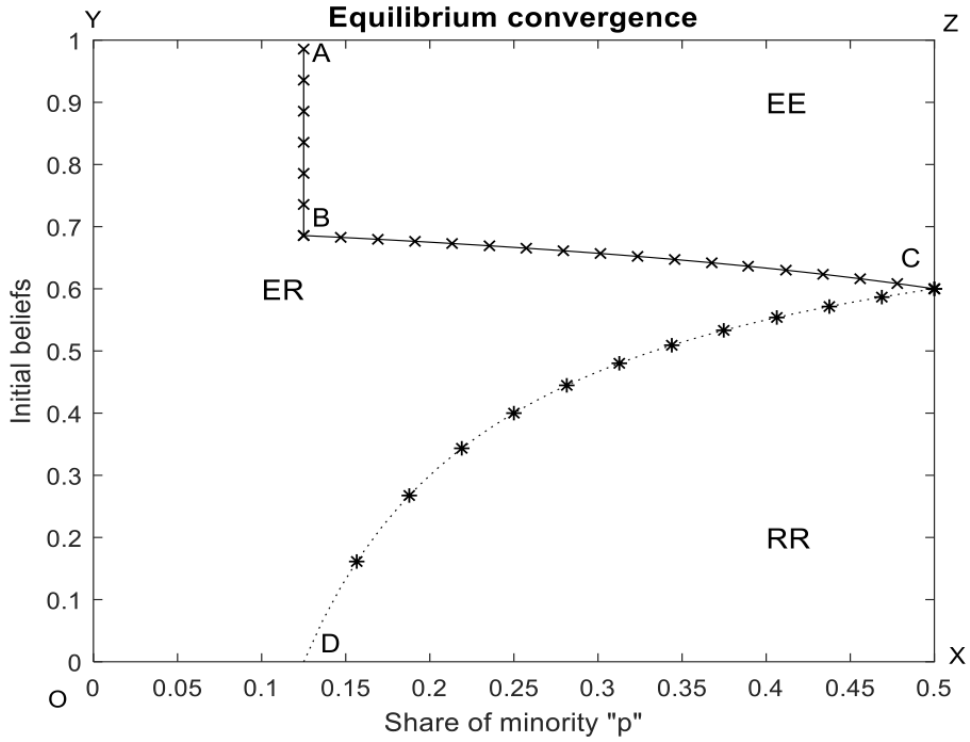


Figure 1.13: Expected equilibrium convergence



The expected equilibrium convergence with random initial beliefs, with parameters c=d=0.2 and g=s=0.3.

2

When Giulia and Andrea meet Salma and Omar: An experimental analysis

2.1 Introduction

Adopting or reacting to the traits of different cultures that we encounter is a human phenomenon. Acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original culture patterns of either or both groups (Redfield et al. 1936). This paper presents an experimental study to determine the adaptation levels of the two groups with different cultures coming into unavoidable contact with each other. I follow the cultural adaptation game where the key aspect of the game is that individual payoffs are dependent on both the coordination with the same group members by maintaining own cultural norms and cooperation with the other group members by adapting to the other culture's norms.

Many real-life scenarios fit the cultural adaptation game. For instance, not wearing clothes that can be improper in certain cultures at a public space such as offices or parks could be a form of adaptation that can come from both the majority and the minority cultures. Another instance would be not serving food that is prohibited in certain cultures in public lunches or the school common lunches. The different forms of adaptation could be adapting to what is polite and not polite in different cultures or learning the social etiquette of other cultures. Choosing the topic of discussion wisely when one is sitting in a room with people from different cultural backgrounds where talking about certain things is considered to be inadequate are certain examples where this game finds external validity.

To introduce the payoffs and the game in such a way that it follows the theories of acculturation, I use the cultural adaptation game with the following steps. In the experiment,

12 participants play the cultural adaptation game repeatedly. The focus of the experiment is when one-third of the participants belong to the minority and the rest two-third belong to the majority, that is four participants are of one type and eight are of the other type. In each round of play the participants interact with every other participant in pairs. The players must choose between embracing the other culture at a cost "$c = 0.2'$" or rejecting the other culture and keep following own group norms at no additional cost. Each participant's payoff in each interaction is dependent on the type of the other player and his/her action. When the same type players interact, it is a pure coordination game where if the players fail to coordinate each player suffers an identity loss "$d = 0.5$". This loss is increasing in the number of people with whom a participant is not able to coordinate with. Therefore, it is a dominant strategy for all players to coordinate on rejecting. When the different type players interact, they suffer a loss of "$s = 0.3$" if both players reject and gain "$g = 0.3$" if both players embrace and there is no extra gain or loss when the players of different types fail to coordinate. This represents the loss from conflict when the players follow their own norms and segregate but gain if players integrate with each other. The loss or the gain is increasing if players with opposite colors reject or embrace respectively. All aspects of the game are common knowledge.

The parametrization of the model follows the properties associated with different forms of hybrid cultures. The game predicts four pure strategy Nash equilibria which map into the four forms of hybrid cultures: integration with aspects of both cultures as a result of mutual adaptation, assimilation with aspects of only majority culture as a result of only minority embracing and majority rejecting, accommodation with aspects of only minority culture is a result of majority embracing and minority rejecting, and segregation with no hybrid culture as a result of both majority and minority rejecting. Theoretically, integration is the most efficient outcome where all the participants embrace leading to the lowest possibility of conflict, higher creativity, low levels of discrimination and prejudice etc. When participants belonging to one group embrace and the other group rejects, the hybrid culture consists of aspects only of the culture leading to low levels of conflict but also low levels of creativity and forgone gains. the worst outcome is when all the participants reject leading to a segregated society with the highest possibility of conflict and discrimination.

The results show that participants are not able to achieve the efficient outcome without a leader. The participants tend to converge to either assimilation or segregation, when it is common knowledge that integration is socially optimal. The majority participants never adapt/cooperate with the minority and the minority participants tend to adapt

with the majority participants with 50% probability. That is, either the hybrid culture consists of only majority traits or we converge to a fragmented pluralistic society with least cooperation between groups. Since the groups are not able to cooperate to achieve the best possible outcome, I introduce a possibility of communication through a leader to improve efficiency. Cultural leaders may influence the adaptation levels of their as well as other group members. There is one participant selected from the majority and one from the minority to be a leader. The role of the leader is to send a message to the rest of the participants about what could be the best strategy. I use a 2X2 experimental design. The first dimension is based on ability of the leader that is either the leader is of high ability or low ability. The second dimension is which participants receive the message, that is either only the same group participants receive the message (Partisan) or both the group participants receive the messages (Universal). Introducing a leader improves the adaptation levels for both the majority and the minority but only when the leader is of high ability and the message is universal. This also leads to a higher level of efficiency as well as reduces inequality as the likelihood of mutual adaptation increases. This evidence suggests that, having high ability leaders from different cultures, who understand the benefits of adapting and who are able to communicate not just with their own cultural groups but with the population as a whole, facilitates higher efficiency and low levels of inequality in a multicultural society where inter-cultural contact is inevitable.

The paper proceeds as follows. Section 2 gives a review of the related literature. Section 3 describes the cultural adaptation game with theoretical considerations. Section 4 describes the experimental design. Section 5 reports the results and Section 6 offers final considerations with concluding remarks.

2.2 Literature review

This paper is related to literature from different discipline to motivate the structure of the game, its parameterization as well as the experimental design. The structure of the cultural adaptation game takes valuable insights from extensive research in cross-cultural and multicultural psychology. As also shown in the previous chapter, researchers in these disciplines identify different forms of multicultural ideologies or the kind of hybrid culture that may exist in a culturally diverse environment with constant cross-cultural contact. A hybrid culture constructed with aspects of both cultures leads to an integrated society increasing the accessibility to multiple knowledge domains influencing creative-cognition (Cheng et al. 2008; Maddux & Galinsky 2009), greater academic achievement (Régner &

Loose 2006), greater cognitive complexity (Benet-Martinez 2006), integrative complexity (Tadmor et al. 2009), lowering the levels of prejudice and discrimination, positive inter-group attitudes and social behavior (Schofield 1991). Whereas a hybrid culture where none of the group adapts leads to a segregated society increasing possibility of conflict (Corvalan & Vargas 2015), lowers the levels of public goods (Trounstine 2016), lowers the the levels of trust (Rothwell 2012) among other things. If the minority cultures adapt to majority or mainstream cultures, it leads to an assimilated society with a low possibility of conflict but also forgone gains as described above such as the knowledge domain, creative-cognition etc. And the last possibility is where the majority culture adapts to the minority which leads to an accommodated society, where the possibility of conflict is still high because the larger share of the population adapts, and the smaller share does not. But what are the factors that affect these acculturation or adaptation patterns patterns? What are the consequences when either, both or none of the groups adapt?

This study is related to the theoretical as well as empirical investigations that model acculturation as equilibira however take into consideration the acculturation strategies of the minorities, even though majority's strategies are equally important. Bisin et al. (2016) show how the interaction of cultural transmission, peer effects and social interactions, and identity choices affect the assimilation patterns of immigrants. Secondly some recent studies has also taken into consideration the acculturation strategies of the majority in terms of forming networks with different cultures for economic gains (Advani & Reich 2015). This study focuses on the choice of within and between group networks, however I focus on the unavoidable contact where individuals do not choose to meet other individuals from same or different cultural backgrounds. The recent paper by Goyal et al. (2017) focuses on both exogenous as well as endogenous contact, however it differs from the current study in several respects. First, their paper is based on a simple coordination game and do not have any common action that lead to an adjustment from both the majority and the minority which leads to better payoffs. Secondly they use the proportions of the minority to be relatively high (46%) which is unrealistic. They also do not check any ways to improve the coordination between groups which is the core of the current study. Related experimental literature on identity and inter-group relations focuses on equal proportion of the two groups which is unrealistic.

Furthermore, existing research in group experiments uses either sequential move dictator games (Chen & Li 2009; Kranton & Sanders 2017) with the same proportions of the two groups or the simultaneous move games which do not take into consideration the aspects

of between group complementarities and the within group conformity. This lacks external validity in the context of cultural adaptation since in certain situations individuals move simultaneously with both the aspects of inter-group contact active at the same time. I use the cultural adaptation game where individuals belonging to different cultural groups come into contact with each other with within group social pressure to take actions according to own group norms. But there are also between group complementarities if individuals adjust with the other group. Individuals take actions simultaneously irrespective of whether they belong to the minority or the majority.

Earlier experimental literature on identity and inter-group relations has concentrated only on the aspect of in-group favoritism and out-group discrimination and its effects on social preferences but none of the earlier experiments have tested it in a game like this where there is a substitution between within and between group coordination. That is, the better outcome of within group coordination leads to a worse payoff between groups and vice versa. Understanding this trade-off is crucial in understanding the effects of group identity on the acculturation strategies of the individuals. Secondly, previous experiments have mostly been based on group matching and not individual matching which is dependent on different proportions of the population. To the best of my knowledge, most of the previous experiments on identity considered equal proportion of the two groups or very high proportions of minority which is unrealistic.

Lastly to improve efficiency, I introduce the possibility of communication. Communication has been to shown to have positive effects of cooperation in experiments to improve cooperation and efficiency in different settings (Cooper & Kühn 2014; Embrey et al. 2013). Communication can be of different forms such as pre-play communication among the participants, communication after a defection, free form communication etc. In this experiment, I choose communication through the medium of a cultural leader who can send a message to the rest of the participants. Cultural leaders can play a significant role in changing the cooperation or adaptation levels. Cultural leaders, through the medium of cultural institutions like mosques, churches, schools or ethnic associations may have an important impact on the acculturation patterns of individuals (Verdier & Zenou 2018). For example, in the United States, sermons, lectures, and discussions held in places of worship on immigration influence the ways that parishioners think about immigration policy (Nteta2012). Within Islam, contemporary pronouncements by clerics can have substantial sway among lay Muslims, defining norms of acceptability and permissibility for the entire range of human action (Nielsen, 2012). Bhalotra et al. (2018) find that religious minority leaders (Muslims) in india improve coordination where as the majority

leaders (Hindus) do not in a simple coordination game.

2.3 The cultural adaptation game

The cultural adaptation game consists of players who interact with each other repeatedly for a finite number of rounds. Each round is a stage game with a finite number of pairwise interactions between the players depending on the number of players. There is a group of N players. Each player $i \in \{1, \ldots, N\}$ is of a type $k \in \{A, B\}$. All players must simultaneously choose an action $a_i \in \{reject, embrace\}$ at the beginning of a stage game. The action space depicts following own norms if a player chooses to reject and to adjust to the norms of the other type if a player chooses to embrace but at an individual cost.

Players make choices at the beginning of the stage game and meet everyone in pairs. That is, a player i is matched with every other player j in pairs and the choice of player i is fixed for all the $N-1$ pairwise encounters. This is the same for all N players which constitutes a stage game and this stage game is repeated for a finite number of rounds.

Payoffs in a stage game

Player receives points for every match in a stage game. The payoffs for a player are the sum of points received from all $(N-1)$ pairwise matches. The payoffs from a single pairwise match are shown in Table 2.1.

The left matrix shows the payoffs from a single pairwise match of the same types, that is when a player of type A (type B) is matched with a player of type A (type B). If both players choose to reject, both get 20 points. If both players choose to embrace, there is no loss from mis-coordination however both players pay a cost of 4 points for adjusting and receive 16 points. If one player chooses to reject and the other chooses to embrace, both the players lose 10 points from mis-coordination but the player choosing to embrace pays also the adjustment cost of 4 points. Therefore, the rejecting player gets 10 points and the embracing player gets 6 points. If both the players choose to embrace, both the players pay the adjustment cost but do not suffer the loss from mis-coordination and get 16 points each. This pairwise match represents a simple pure coordination game with two pure strategy Nash equilibria, $\{reject, reject\}$ and $\{embrace, embrace\}$, and one mixed strategy Nash equilibrium. The pure strategy Nash equilibrium $\{reject, reject\}$ is payoff dominant in this single pairwise match represented as a bold cell in Table 2.1.

The right matrix shows the payoffs from a pairwise match of the different types, that is when a player of type A (type B) is matched with a player of type B (type A). If both

Table 2.1: Payoffs in a pairwise match among same types (left panel) and different types (right panel)

SAME TYPE MATCH		Type A (Type B)			DIFFERENT TYPE MATCH		Type B (Type A)	
		reject	embrace				reject	embrace
Type A (Type B)	reject	**20** **20**	10 6		Type A (Type B)	reject	14 14	20 16
	embrace	6 10	16 16			embrace	16 20	**22** **22**

players coordinate on embracing, both players pay the adjustment cost but also gain 6 points from the inter-cultural benefits of mutual adaptation. Therefore, each player gets 22 points from embracing. If both players coordinate on rejecting, there is no adjustment cost, but the players face a loss of 6 points from rejecting each other and get 14 points each. This represents a scenario of segregation from both players by choosing to follow own cultural norms and not adjusting to each other. If only one player embraces, there is no extra loss or gain. But the one embracing pays the adjustment cost of 4 points and gets 16 points and the rejecting player gets 20 points. This pairwise match represents a coordination game with only one pure strategy Nash equilibrium where both the players embrace and get 22 points each represented as a bold cell in Table 2.1.

The payoffs for player i in a stage game is the sum total of the points from all $N-1$ pairwise matches.

Nash Equilibria of a stage game

Assume there are both type A and type B players, and the proportion of type A players is p with $p \in \left[0, \frac{1}{2}\right]$ and the proportion of type B is $1-p$ with $(1-p) \in \left[\frac{1}{2}, 1\right]$, that is type A is the minority and type B is the majority. For each player the strategy profile is $s_i = \{reject,$ embrace $\}$. In a stage game, the strategy profile $(s_1^*, s_2^*, \ldots, s_N^*)$ is a Nash equilibrium if $\Pi_{i \in k}\left(s_i^*, s_{-i}^*\right) \geq \Pi_{i \in k}\left(s_i, s_{-i}^*\right)$ for all $i \in N$ and for all $s_i \in S_i$. I denote $\Delta\left(A_i\right)$ as the set of probability distributions over $A_i$and $\sigma_i \in \Delta A_i \equiv \{q_k, (1-q_k)\}$ as a

mixed strategy of player $i \in N$ and $k \in \{A, B\}$. That is a player pf type A chooses to reject with probability q_A and chooses to embrace with probability $(1 - q_A)$. Similarly, a player of type B chooses to reject with probability q_B and chooses to embrace with probability $(1 - q_B)$.

This game predicts symmetric Nash equilibria of a given type, where $q_A = \left\{0, \frac{N(8p-1)-7}{10(pN-1)}, 1\right\} \forall i \in A$ and $q_B = \left\{0, \frac{7(N-1)-8pN}{10((1-p)N-1)}, 1\right\} \forall i \in B$. The strategies might differ across types, but the strategies are symmetric for all players of the same type. The set of Nash equilibria are dependent on the proportion of the minority p.

Case I: $p = 0$

When $p = 0$, that is there is no minority and $i \in B \forall i \in \{1, \ldots, N\}$, there are two pure strategy Nash equilibrium when all players of the same type make identical choices with probability 1 and there is a unique mixed strategy Nash equilibrium. The two pure strategy Nash equilibria are $s_i^* = \{1, 0\} \forall i \in B$ where all players reject with probability 1, that is $q_k = 1$; and $s_i^* = 1 \forall i \in B$ where all players embrace with probability 1, that is $q_k = 0$. The mixed strategy Nash equilibrium is $s_i^* = \{q_k, (1 - q_k)\} \forall i \in \{1, \ldots, N\}$ where $q_k = \frac{7(N-1)}{10N}$, that is all the players reject with probability $\frac{7(N-1)}{10N}$ and all the players embrace with probability $\frac{3(N-1)}{10N}$.

Case II: $p > 0$

When $p > 0$, that is there are some players of type A and some are of type B, the game again predicts multiple Nash equilibria with both pure and mixed strategies. The pure strategy equilibrium is again defined as an equilibrium when there is no miscoordination amongst the same type players, that is all the players of type A take the same action and all the players of type B take the same action. However, the actions of the players of two types could differ. The mixed strategy sets of the Nash equilibria differ for majority and minority and are dependent only on what the same type players do and not on what the other type players do. There exist nine Nash equilibria where four are pure strategy Nash equilibria for both majority and minority, two Nash equilibria where the minority has mixed strategies and the majority has pure strategies, two where the majority has mixed strategies and the minority has pure strategies and one with both minority and majority with mixed strategies. I characterize all the equilibria below:

1. Four pure strategy Nash equilibria for both majority and minority:

    a) EE (Embrace-Embrace/Integration): If all the players of type A embrace and all players of type B embrace with probability 1, that is, $s_i^* = \{0, 1\} \forall i \in A$ and $s_i^* = \{0, 1\} \forall i \in B$.

b) ER (Embrace-Reject/Assimilation): If all the players in the minority that is type A embrace and all the players in the majority that is type B reject, that is $s_i^* = \{0,1\}\forall i \in A$ and $s_i^* = \{1,0\}\forall i \in B$.

c) RE (Reject-Embrace/Accommodation): If all the players in the minority reject and all the players in the majority embrace that is $s_i^* = \{1,0\}\forall i \in A$ and $s_i^* = \{0,1\}\forall i \in B$.

d) RR (Reject-Reject/Segregation): If all the players in the minority reject and all the players in the majority also reject that is $s_i^* = \{1,0\}\forall i \in A$ and $s_i^* = \{1,0\}\forall i \in B$.

2. Two Nash equilibria where the minority randomizes, and the majority uses pure strategies:

a) ME (Mixed-Embrace): If all the players of type A randomize between embracing and rejecting that is use mixed strategies and all players of type B embrace with probability 1, that is,$s_i^* = \left\{\frac{N(8p-1)-7}{10(pN-1)}, \frac{N(2p+1)-3}{10(pN-1)}\right\}\forall i \in A$ and $s_i^* = \{0,1\}\forall i \in B$.

b) MR (Mixed-Reject): If all the players of type A randomize between embracing and rejecting that is use mixed strategies and all players of type B reject with probability 1, that is, $s_i^* = \left\{\frac{N(8p-1)-7}{10(pN-1)}, \frac{N(2p+1)-3}{10(pN-1)}\right\}\forall i \in A$ and $s_i^* = \{1,0\}\forall i \in B$.

3. Two Nash equilibria where the majority randomizes, and the minority uses pure strategies:

a) EM (Embrace-Mixed): If all the players of type A randomize between embracing and rejecting that is use mixed strategies and all players of type B embrace with probability 1, that is, $s_i^* = \{0,1\}\forall i \in A$ and $s_i^* = \left\{\frac{7(N-1)-8pN}{10((1-p)N-1)}, \frac{N(3-2p)-3}{10((1-p)N-1)}\right\}\forall i \in B$.

b) RM (Reject-Mixed): If all the players of type A randomize between embracing and rejecting that is use mixed strategies and all players of type B reject with probability 1, that is, $s_i^* = \{1,0\}\forall i \in A$ and $s_i^* = \left\{\frac{7(N-1)-8pN}{10((1-p)N-1)}, \frac{N(3-2p)-3}{10((1-p)N-1)}\right\}\forall i \in B$.

4. One Nash equilibria where the minority randomizes, and the majority uses pure strategies:

Mixed-Mixed (MM): If all the players of both type A and type B randomize between embracing and rejecting, that is use mixed strategies with strategy profiles, $s_i^* = \left\{\frac{N(8p-1)-7}{10(pN-1)}, \frac{N(2p+1)-3}{10(pN-1)}\right\} \forall i \in A$ and $s_i^* = \left\{\frac{7(N-1)-8pN}{10((1-p)N-1)}, \frac{N(3-2p)-3}{10((1-p)N-1)}\right\} \forall i \in B$.

Existence

The existence of the above defined Nash equilibria depends on the different proportions of the minority and the majority.

Case I: $p = 0$

With no minority, all three Nash equilibria exist, that is the pure strategy as well as the mixed strategy Nash equilibria.

Case II: $p > 0$

With $p > 0$, the necessary conditions for the existence of the Nash equilibria are shown in Table 2.2.

Table 2.2: Necessary conditions for equilibrium existence

Nash equilibrium	Threshold when $p \in (0, \frac{1}{2}]$
EE	$p \in (0, \frac{1}{2}]$
ER	$p \in (0, \frac{1}{2}]$
RE	$p \in [\frac{19}{96}, \frac{1}{2}]$
RR	$p \in [\frac{19}{96}, \frac{1}{2}]$
ME	$p \in [\frac{1}{5}, \frac{1}{2}]$
MR	$p \in [\frac{1}{5}\frac{1}{2}]$
EM	$p \in (0, \frac{1}{2}]$
RM	$p \in (0, \frac{1}{2}]$
MM	$p \in [\frac{1}{5}, \frac{1}{2}]$

Nash equilibria for the experimental parameters $(N = 12, p = \{0, \frac{1}{3}\})$

This experiment consists of 12 participants and only two possible values of p. The first case is when there is no minority ($p = 0$), that is there are 12 players of type B. The second case is with a one-third minority ($p = \frac{1}{3}$), that is there are 4 players of type A and 8 players of type B. With these parameters, all three equilibria may exist when $p = 0$ but only the four pure strategy Nash equilibria exist when there is a one-third minority. Table 2.3 shows the payoffs possible for both the minority and the majority for all four pure strategy Nash equilibria.

Table 2.3: Payoffs under pure strategy Nash equilibria

		Every player $i \in B$ (Majority)	
		reject	embrace
Every player $i \in A$ (Minority)	reject	RR (Segregation) 196 172	RE (Accommodation) 176 220
	embrace	ER (Assimilation) 220 176	EE (Integration) 200 224

Social Optimality

I define socially optimal as the sum of payoffs of all the players. Table 2.4 ranks the Nash equilibria according to the sum of the expected payoffs of all the participants under the two possible values of p, p=0 and $p = \frac{1}{3}$.

Table 2.4: Expected payoff under different Nash equilibria

$p = 0$		$p = \frac{1}{3}$	
$\{reject, reject\}$	2640	Integration	2496
$\{embrace, embrace\}$	2112	Assimilation	2464
$\{mixed, mixed\}$	2640	Accommodation	2288
		Segregation	2256

Case I ($p = 0$): It is socially optimal for all players of type B to reject when there is no other player of type A.

Case II ($p = \frac{1}{3}$): With 4 players of type A and 8 players of type B, it is socially optimal for all the players to embrace and integrate, although type A players make maximum points when integration is the equilibrium and type B players make maximum points when assimilation is the equilibrium as shown in Table 2.3.

Equilibrium selection

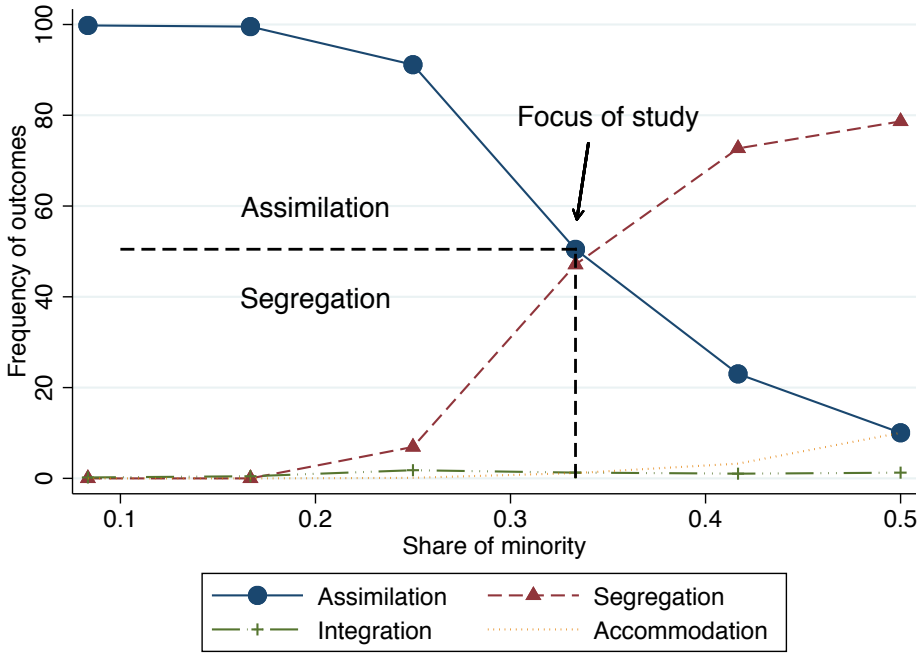
Given there is multiple equilibria for all values of p, it is important to understand which equilibrium gets selected. To understand the equilibrium selection, I conduct computerized simulations where players play the cultural adaptation game repeatedly. All the players have randomly distributed initial beliefs drawn from a uniform distribution about the proportions of the same and different types embracing or rejecting. A player has two sets of beliefs: about the proportion of the same type embracing and about the proportion of the other type embracing.

Players are myopically rational and take the actions to maximize the expected payoffs of the current round based on the beliefs. Since this game is played repeatedly, at the end of each round of a stage game, the players realize payoffs and learn about the choices of the other players and update their beliefs. Players make a choice between embracing and

rejecting at the beginning of each round, maximizing their current round payoffs, based on their updated beliefs from the previous round. This process is repeated until there is no change in the actions of the individuals from one round to the next round of the stage game i.e. the outcome is stable.

Figure 2.1 shows the frequency with which players converge to different pure strategy Nash equilibria in computerized simulations with different shares of minority. When the share of the minority is zero, that is there are only type B players in the population, players tend to choose the socially optimal outcome which is $\{reject, reject\}$. That is players tend to follow their own norms and maximize their payoffs as the same type players.

Figure 2.1: Frequency of equilibria in computerized simulations



When the share of minority is low, the frequency of assimilation is the highest. As the share of minority increases, the frequency of assimilation starts decreasing and the likelihood of segregation starts increasing. The focus of the experiment is when the proportion of the minority is one-third. At this proportion of minority, it is socially optimal for the minority and the majority to "embrace" and integrate as shown in Table 2.4. For majority the best possible outcome is when everyone in the majority rejects and everyone in the minority embraces. Whereas for the minority the best possible outcome is when

everyone embraces. As shown in the figure, the majority always tends to reject, whereas the minority embraces half of the time but also tends to segregate by rejecting half of the time. The frequency of integration is negligible even though it is the socially optimal outcome. This trade-off is due to the fact that the majority benefits more when the minority assimilates whereas the society as a whole will benefit more if everyone integrates but at the cost of the majority. The results from the laboratory experiment would make the predictions from the computer simulations even stronger.

2.4 Experimental design

The experimental design is parallel to the cultural adaptation game described in the previous section. There are 5 treatments described in Table 2.5. In all treatments, the following procedure is followed of the cultural adaptation game. There are two types of players Blue and Red. The two types are based on the colors assigned to the participants. The computer randomly assigns the color blue to half of the participants and red to the other half at the beginning of the experiment which is private information. The participants play the game repeatedly for 46 rounds. At the beginning of each round, the participants choose between two options "reject" and "embrace". I use neutral words for these actions where $reject \equiv YOURCOLOR$ and $embrace \equiv WHITECOLOR$. The 46 rounds are divided into two parts. Part 1 lasts 6 rounds and part 2 lasts 40 rounds. Part 2 is further divided into 2 parts of 20 rounds each. I call the second part of part 2 as part 3 for ease of explanation. The participants are divided into two societies of equal size at the beginning of part 1 and part 2. In each part participants interact within their society.

Case I $p = 0$: For part 1 there is no minority and all the players in each society are of same type, that is all the red participants are in society 1 and all blue participants are in society 2. This part is designed for two reasons: first is for a better understanding of the game so that the subjects do not get confused what is happening, and second is to establish a norm before a minority is introduced.

Case II $p = 1/3$: In the second part there is a one-third minority, that is from each society 4 randomly selected players are assigned to the other society. The four participants in each society who are assigned to the other society in part 2 are selected based on their performance in an incentivized quiz. At the beginning of part 1 and part 2, before the group assignment, all the participants answer a quiz based on the understanding of the game. Participants are ranked according to their combined performance in the

two quizzes. The ranking is done separately for the two types. Once the participants are ranked, from each society in part 1, there is one participant randomly selected from the top three best performers in the quiz, a second one randomly selected from the participants ranked 4th to 6th in the quiz, the third participant randomly selected from the participants ranked 7th to 9th in the quiz, and the fourth participant randomly selected from the bottom three performers in the quiz. These four participants from each society are assigned to the other society.

At the end of part 1, the break in part 2 and at the end of part 2, the participants are shown the average payoffs for the participants in their own society. Since in part 2, there are both types of participants, the average payoffs are shown separately for the two types but only in the same society.

Treatments

The experiment follows a 2X2 design with a baseline control treatment and 4 other treatments:

Table 2.5: Experimental treatments

	No leader	High ability leader	Low ability leader
No message	Baseline	–	–
Partisan message	–	Partisan High	Partisan Low
Universal message	–	Universal High	Universal Low

The sessions were conducted in April-May 2019 in three different colleges in Pune, India. Conversion rate: 100 points = Re. 1. The subjects earned Rupees 500 on average.

Baseline: The baseline treatment is the "no leader-no message" treatment. This is the control treatment where the participants play the game as described above.

Leader: For the four additional treatments, two leaders in each society are selected in part 2, one leader for each color. Therefore, in each society, one leader is from the participants who have the color red and 1 leader is from the participants who have the color blue. Participants are informed at the beginning of part 2 if they are assigned the role of a leader or not.

The leader has the option to send a message to his or her own society participants. The message could be sent at the beginning of every fifth round, i.e. at the beginning of round 1, round 6, round 11, round 16 and so on. The message can contain anything, including what the leader thinks is the best approach to the experiment, what the leader intends to do, or what the leader thinks others should do. However, there are some limitations to the content of the messages: the leaders are not allowed to use any identifiers such as real name, nickname, or self-description of any kind. The leaders are not allowed to make any threats or promises relating to the time after the experiment. The leader can send a message as long as 200 characters and they are given 40 seconds to write the message. The leader is called a speaker during the experiment.

The leader selection and who can read the message in the group is based on the treatments divided into a 2X2 design:

1. Ability: The ability measure is based on the performance in the incentivized quiz at the beginning of part 1 and part 2. There is either a high ability leader or a low ability leader:

    - High ability: The leader is selected from the top three performers in the quiz. That is, in society 1, the red leader is from the two participants of the top three performers who were not assigned to society 2 and the leader with color blue is the one participant from the top three performers from society 2 who was assigned to society 1. Similarly, in society 2, the leader with blue color is selected from the two participants of the top three performers who were not assigned to the other society and the leader with color red is the one participant from the top three performers from the participants with color red who was assigned to society 2.
    - Low ability: The leader is selected from the bottom three performers in the quiz. That is, in society 1, the red leader is from the two participants of the bottom three performers who were not assigned to society 2 and the leader with color blue is the one participant from the bottom three performers from society 2 who was assigned to society 1. Similarly, in society 2, the leader with blue color is selected from the two participants of the bottom three performers who were not assigned to the other society and the leader with color red is the one participant from the bottom three performers from the participants with color red who was assigned to society 2.

2. Message: The message can be sent to the participants in the same society in two ways:

    - Partisan message: The leader can send a message only to the participants in the same society and the same color as the leader. That is, every participant receives only one message from the leader of the same color.
    - Universal message: The leader can send a message to all the participants in the same society irrespective of the color of the participants. That is each participant receives two messages, one from the leader of the same color and one from the leader of the other color again in the same society.

Instructions were read aloud at the start of the experiment and left on the participants' desks (a copy is in the Appendix). The instructions were written in English but explained in both English as well as Hindi. No eye contact was possible among participants. On average, a session lasted about 90 minutes, including instruction reading and the exit survey. Details about the sessions are in Table 2.6. The funding for the experiment was provided by Center for Experimental and Social Sciences (CESS) at Nuffiled college ,Äì FLAME University. There were 3 sessions conducted for Baseline with a total of 72 participants, two sessions each for Partisan High, Partisan Low and Universal Low with a total of 48 participants for each, and due to technical difficulties only one session for Universal High with 24 participants. The average age of participants was 21 years and the sessions were gender balanced. The payoffs of the subjects were dependent on the total points earned at the end of the experiment. The average payments were Rs. 500 (Euro 6.8) which was in line with the policy of CESS, India and payments were made in private.

Table 2.6: Summary for the experimental treatments

	Baseline	Partisan	Partisan	Universal	Universal
Sessions	3	2	2	2	1
Average age	21	21	21	21	19
Female	44%	48%	42%	55%	62%

Exit survey: At the end of the experiment the subjects are asked to answer a set of questions based on the conformity scale. Subjects are asked to rate ten statements measuring conformity developed by Hong and Faedda (1996). Example statements are "I become angry when my freedom of choice is restricted" or "it disappoints me to see

others submitting to standards and rules." For each statement subjects indicated on a five-point rating scale how much they agree with the statement. Each experimental session employed 24 participants with two societies in each session of 12 participants each. Combining all the treatments, we recruited a total of 240 participants for 10 sessions at three colleges in Pune, India. The experiments were conducted with the help of CESS at Nuffield college - FLAME University in Pune, India. The experiment was programmed in z-Tree (Fischbacher 2007) and subjects were recruited through posters and flyers.

2.4.1 Results

There are six key results: Result 1 is on the rejection rate for both types, Result 2 compares the coordination within the majority and the minority, Result 3 and Result 4 focus on the equilibrium frequency and selection, Result 5 describes the efficiency and inequality between the majority and the minority in different treatments. I follow these results with some text analysis of the messages sent from the leaders in result 6.

Result 1: *Average rejection rate*

1. *Average rejection rate for the majority is always higher than the minority.*
2. *Introducing a leader decreases the average rejection rate but only in Universal High. This decrease is entirely due to the majority.*

Support for these results comes from Figure 2.2 and Tables 2.7 and 2.8.

Figure 2.2 gives an overview of the average rejection rate for the majority and minority in all treatments (each observation is the average rejection rate for all the sessions taken together for part 2 and part 3). All the observations are below the 45 degree line depicting higher rejection rate for majority (see column 1 Table 2.8). Table 2.7 shows the corresponding averages separately for part 1 to part 3 and also for part 2 and part 3 together. Overall, average rejection in all the treatments in part 1 is 90%-95% which is also the dominant strategy. The average rejection rate for majority ranges from 89% to 95% apart from Universal High, where the average rejection rate is only 51% which is 40% lower than the Baseline. This suggests that the average rejection rate for the majority decreases only with a high ability leader who sends a message to all the players. The rejection rate for the minority is lower in Partisan Low and Universal High and higher in Partisan High and Universal Low although they are not significant. at 41% and 39% which is 16% and 18% lower than the Baseline respectively. Although this decrease is

not significant. However, it is significantly higher in Partisan High and Universal Low at 74% and 70% which is 17% and 13% higher than the Baseline respectively.[1]

Figure 2.2: Average rejection rate for majority and minority in all treatments for part 2 and part 3.

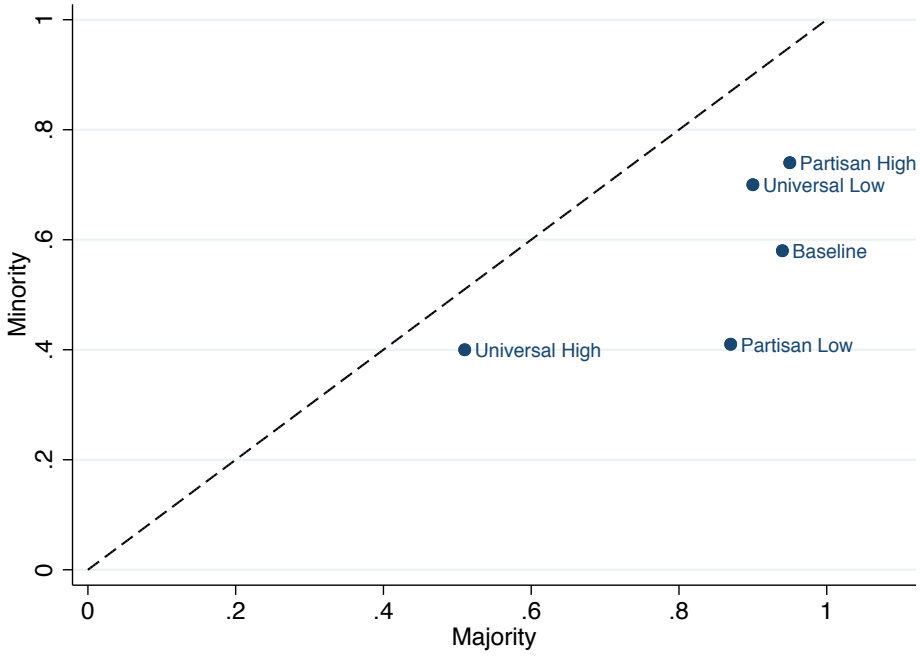


Table 2.8 gives additional evidence for the differences in rejection rates for the minority and the majority in all the treatments. The dependent variable is the average rejection rate for a participant in each session. Having a leader has differential effects on minority and majority based on the ability of the leader and to whom the leader sends the message. Column 1 of the tables shows the average rejection rate for all the participants together and columns 2 and 3 show it separately for minority and majority.[2] These regressions are only for part 2 and part 3 as those are the relevant parts with different shares of the population. All the regressions cluster standard errors at the session level.[3] The average rejection rate is 28.8% higher for the majority. It also shows that the average rejection rate is 35.2% lower in Universal High compared to Baseline and it does not change in

1 I perform Epps-singleton tests and Mann-Whitney tests for teh significance which are shown in the appendix.

2 In the whole analyses I use simple OLS regressions

3 I do not use session fixed effects as there are too few observations for statistical power.

Table 2.7: Average rejection rate in a treatment for majority and minority

	Treatments	Baseline	Partisan High	Partisan Low	Universal High	Universal Low
Part 1	Only Majority	0.93	0.94	0.93	0.90	0.95
Part 2 and Part 3	Minority	0.57	0.74	0.41	0.39	0.70
	Majority	0.94	0.95	0.87	0.51	0.89
Part 2	Minority	0.51	0.80	0.45	0.31	0.65
	Majority	0.92	0.93	0.75	0.43	0.86
Part 3	Minority	0.64	0.68	0.37	0.48	0.76
	Majority	0.96	0.97	0.99	0.60	0.93

any other treatments. All the coefficients for all the other treatments are insignificant. Column 2 of Table 2.8 shows that the rejection rate is similar in all the treatments as all the coefficients are insignificant. However for the majority, the average rejection rate is 42.9% lower in Universal High and is not different in any other treatments compared to the Baseline. That is the rejection rate decreases only when there is a high ability leader who sends a message to everyone.

Result 2: *Coordination Rate: Majority coordinates more often than the minority in all treatments apart from Universal High. Universal high improves the coordination rate for the minority and does not change for the majority.*

Support for this result comes from Figures 2.3 and Table 2.9.

I define coordination as the maximum number of players of a type choosing the same action divided by the total number of participants of the same type in a group. That is the proportion of participants of the same type in a group choosing the same action in a round. I take the average of this coordination rate for each group (minority and majority) each society in a session as these rounds are not independent of each other but the societies are. Figure 2.3 gives an overview of the average coordination in all the treatments for all the sessions taken together. The average coordination is significantly higher for the majority than the minority in all the treatments except Universal High. The average coordination rate for the minority ranges from 85% to 88% for all the treatments, that is 85% to 88% of the participants in the minority coordinated on the same action, except Universal High where the average coordination rate is 93%. Whereas for the majority the average coordination rate for all the treatments ranges from 94% to 96% except Universal High where the average coordination decreases to 91%. This shows that

Table 2.8: Participants' average rejection rate across treatments

	(1) Minority & Majority together	(2) Only Minority	(3) Only Majority
Majority	0.288***		
	(0.081)		
Partisan Low	-0.110*	-0.185	-0.073
	(0.049)	(0.194)	(0.075)
Partisan High	0.053	0.145	0.007
	(0.062)	(0.219)	(0.029)
Universal Low	0.007	0.109	-0.045
	(0.049)	(0.155)	(0.024)
Universal High	-0.352***	-0.197	-0.429***
	(0.049)	(0.143)	(0.012)
Observations	240	80	160
R-squared	0.402	0.167	0.397

Standard errors in parentheses

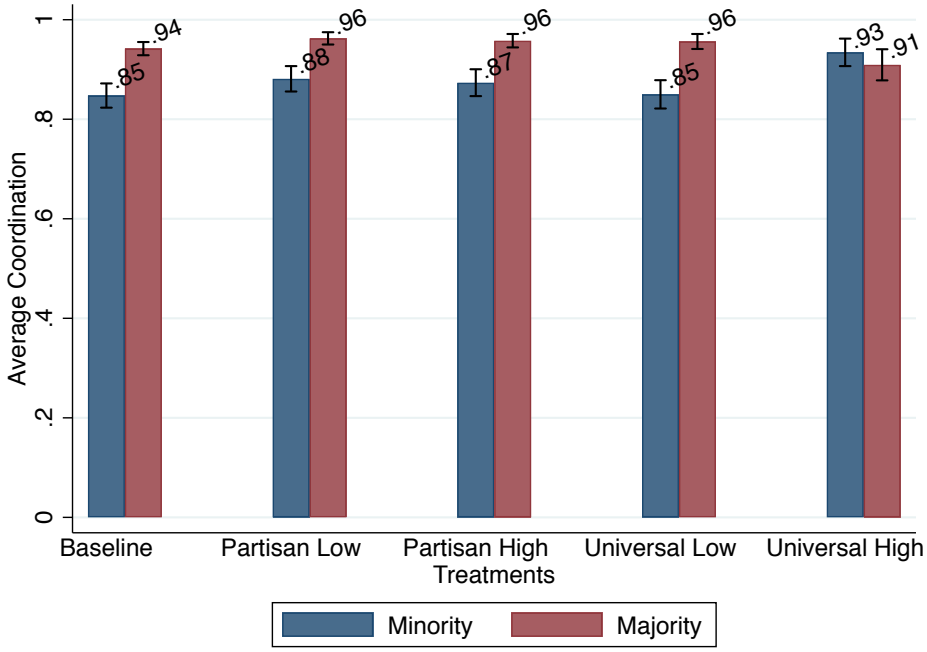
Dependent variable: Average choice of a participant in a session over all rounds.

Robust standard errors in parentheses clustered at the session level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

the majority participants deviate less from the equilibrium since only pure strategy Nash equilibria exist in this setup where there is no within group miscoordination.

Figure 2.3: Average coordination for minority and majority in all treatments



The estimates in Table 2.9 give additional evidence for the coordination differences for the minority and the majority in all the treatments. The dependent variable is the average of the coordination rate of the same type players in a group in every session over all the rounds. The majority coordinates significantly more than the minority by 9.2% and the average coordination rate is also 8.4% higher in Universal High compared to other treatments. However, the majority does not coordinate more than the minority in Universal High, as shown by the interaction term which is negative and significant at 11.7%. Columns 2 and 3 show the results separately for minority and majority. The minority coordination rate is 8.4% higher in Universal High and the majority coordination rate is marginally lower by 3.3% compared to the Baseline. Both the effects are significant at 5%. A high ability leader who can send a message to everyone in the population improves the within group coordination for the minority and does not change it for the majority.

Table 2.9: Coordination rate across treatments

	(1) Minority & Majority together	(2) Only Minority	(3) Only Majority
Majority	0.092***		
	(0.028)		
Partisan Low	0.030	0.030	0.020
	(0.032)	(0.031)	(0.013)
Partisan High	0.023	0.023	0.015
	(0.077)	(0.076)	(0.024)
Universal Low	-0.001	-0.001	0.014
	(0.052)	(0.051)	(0.027)
Universal High	0.084**	0.084**	-0.033**
	(0.030)	(0.030)	(0.012)
Majority in Partisan Low	-0.010		
	(0.029)		
Majority in Partisan High	-0.007		
	(0.096)		
Majority in Universal Low	0.015		
	(0.072)		
Majority in Universal High	-0.117***		
	(0.028)		
Observations	40	20	20
R-squared	0.438	0.146	0.138

Standard errors in parentheses

Dependent variable: Average of the proportion of players, of the same type, choosing the same action over all the rounds in a session.

Robust standard errors in parentheses clustered at the session level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Result 3: *Equilibrium convergence: The probability of participants not deviating from a Nash equilibrium increases with a leader and this increase is the maximum in Universal High.*

As shown in previous section, this game predicts multiple pure strategy Nash equilibria, that is integration, assimilation, accommodation and segregation. Figure 2.4 shows the percentage of rounds when the participants deviated from any of the Nash equilibrium or did not converge to any of the Nash equilibrium. The x-axis shows the number of participants deviating from any equilibrium in a single round and the y axis shows the percentage of rounds. The participants converged to at least one of the four pure strategy Nash equilibria in 38% of the rounds in Baseline. This percentage increases in other treatments with 52% in Partisan Low, 43% in Partisan High, 46% in Universal Low and 55% in Universal High. This shows, that the likelihood of a society converging to an equilibrium state increases by as much as 17% with Universal High compared to the Baseline.

Figure 2.4: Percentage of rounds with the number of participants deviating from the equilibrium

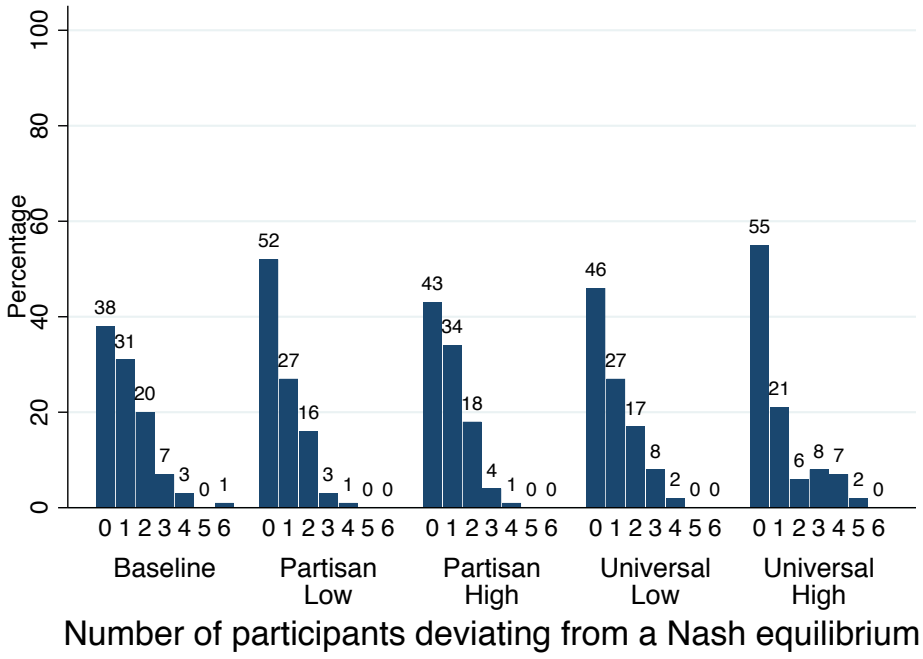


Table 2.10 shows additional evidence for the smaller number of participants deviating from a Nash equilibrium with a leader. The dependent variable is the number of participants

Table 2.10: Equilibrium convergence or deviation

	(1) Zero	(2) One	(3) Two	(4) Three	(5) Four	(6) Five	(7) Six
Partisan Low	0.144*	-0.043*	-0.043	-0.047*	-0.013	0.006	-0.004
	(0.066)	(0.023)	(0.028)	(0.025)	(0.025)	(0.005)	(0.004)
Partisan High	0.057	0.032	-0.024	-0.034*	-0.026	-0.000	-0.004
	(0.094)	(0.040)	(0.047)	(0.016)	(0.021)	(0.000)	(0.004)
Universal Low	0.082	-0.043	-0.036	0.009	-0.007	-0.000	-0.004
	(0.081)	(0.065)	(0.038)	(0.028)	(0.028)	(0.000)	(0.004)
Universal High	0.175**	-0.099***	-0.143***	0.003	0.043*	0.025***	-0.004
	(0.062)	(0.023)	(0.021)	(0.016)	(0.021)	(0.000)	(0.004)
Observations	788	788	788	788	788	788	788
R-squared	0.083	0.008	0.039	0.026	0.032	0.019	0.005

Standard errors in parentheses

Dependent variable: Number of participants deviating from a pure strategy Nash equilibrium in a round. Robust standard errors in parentheses clustered at the session level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

deviating from a Nash equilibrium in a round ranging from zero to six. The likelihood of perfect equilibrium convergence, that is no one deviating from a Nash equilibrium, increases significantly in Partisan Low and Universal High and is the same in Partisan High and Universal Low compared to the Baseline. The coefficients in column are positive for all the treatments but significant only for Universal High and Partisan Low. The likelihood increases by 14.4 % in Partisan Low and 17.5% in Universal High. The rest of the columns in Table 2.10 also show negative and significant coefficients for Partisan Low and Universal High and insignificant for the rest of the treatments.

Result 4: *Equilibrium selection*

1. *The likelihood of converging to at least some equilibrium increases with a leader and is the most with Universal High.*
2. *Participants tend to assimilate or segregate with equal likelihood in Baseline.*
3. *The likelihood of assimilation increases in Partisan Low and decreases in all other treatments.*
4. *The likelihood of segregation decreases in Partisan Low and increases in all other treatments.*
5. *Participants tend to integrate only in Universal High and in no other treatment.*

Figure 2.5 and Table 2.11 confirms result 4. Participants do not converge to any equilibrium in 61% of the rounds in Baseline, 48% in Partisan Low, 57% in Partisan High 54% in Universal Low and only 44% in Universal High showing that a high ability leader with Universal message helps in converging to some equilibrium. The participants assimilate in 18% of the rounds and segregate in 21% of the rounds in Baseline. The percentage of the rounds in which participants assimilate increases to 34% in Partisan Low and decreases to 9%, 5% and 4% in Partisan High, Universal Low and Universal High respectively. Similarly, the percentage of segregation decreases in Partisan Low to 14% and increases to 34%, 40% and 19% in Partisan High, Universal Low and Universal High respectively. Participants also tend to accommodate in Partisan Low and Universal Low for very few rounds. The only treatment where participants tend to integrate is in Universal High. The participants integrate for 33% of the rounds in Universal High.

Figure 2.5: Percentage of rounds with different Nash equilibria

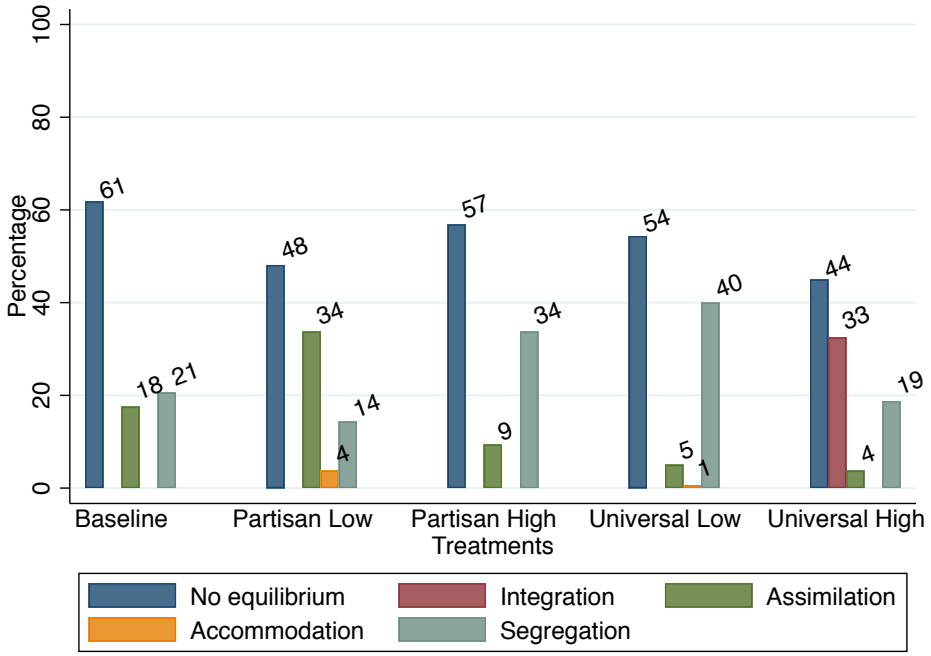


Table 2.11: Equilibrium selection

	(1) No equilibrium	(2) Integration	(3) Assimilation	(4) Accommodation	(5) Segregation
Partisan Low	-0.144*	0.000	0.165	0.037	-0.058
	(0.066)	(0.000)	(0.122)	(0.028)	(0.133)
Partisan High	-0.057	0.000	-0.079	-0.000	0.136
	(0.094)	(0.000)	(0.105)	(0.001)	(0.189)
Universal Low	-0.082	0.000	-0.123	0.006	0.198
	(0.081)	(0.000)	(0.086)	(0.005)	(0.128)
Universal High	-0.175**	0.325***	-0.135	-0.000	-0.014
	(0.062)	(0.000)	(0.077)	(0.001)	(0.126)
Observations	788	788	788	788	788
R-squared	0.083	0.302	0.111	0.029	0.082

Standard errors in parentheses

Dependent variable is a dummy for the pure strategy Nash equilibria which equals 1 if true otherwise 0 in every round. Robust standard errors in parentheses clustered at the session level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 2.11 shows the corresponding regressions for the either no equilibrium, or any of the four pure strategy Nash equilibria. The dependent variable takes the value 1 if true and zero otherwise. The coefficients for Partisan Low and Universal High are negative and significant for no equilibrium confirming that having a leader improves the between group coordination of the participants and participants converge to some equilibrium (see column 1 Table 2.11). This result is a confirmation of Result 3. The probability of integration is positive only in Universal High as integration appears only under Universal High and no other treatment. The probability of assimilation increases by 16.5 percentage points in Partisan Low and decreases in all other treatments although it is insignificant. All other coefficients are insignificant showing that the leader helps changing the equilibrium selection only when the leader is of high ability and is able to send a message to everyone.

Result 5: *Efficiency and inequality*

1. *Efficiency increases in Partisan Low and Universal High and the increase in efficiency is distributed to the minority.*
2. *Having a leader changes the level of inequality between majority and minority. Majority participants earn higher than the minority in all treatments except Universal High.*

Support for result 5 comes from Figures 2.6 and 2.7 and Table 2.12.

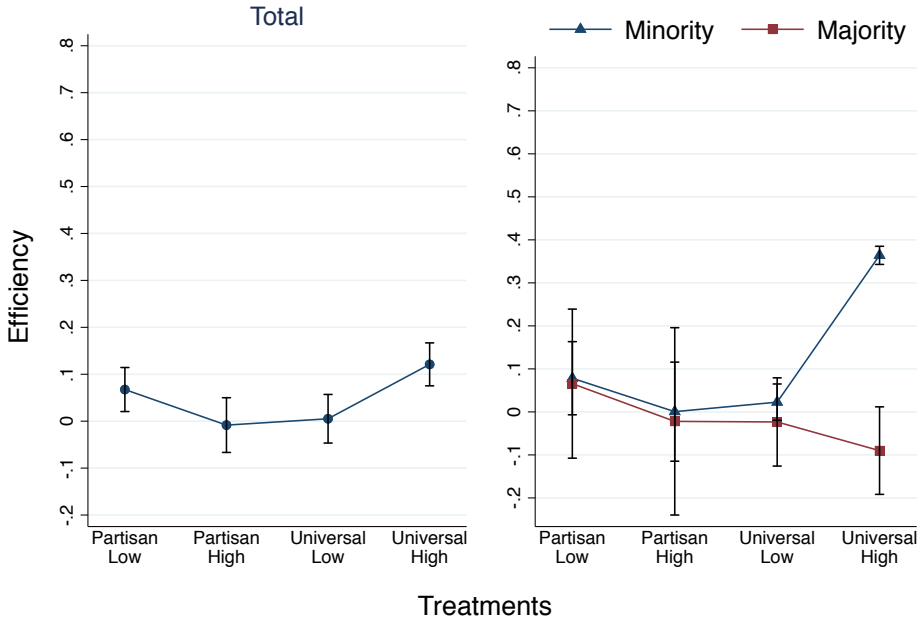
I define efficiency as the average payoff of a player belonging to minority or majority normalized by the maximum and the minimum possible payoff in a round.

$$Efficiency = \frac{Average\,payoff - Minimum\,possible\,payoff}{Maximum\,possible\,payoff - Minimum\,possible\,payoff}$$

Figure 2.6 plots the coefficients with the confidence intervals from a linear regression where the dependent variable is the efficiency in a round. The left panel of the figure shows the efficiency for all the participants and the right panel shows it separately for majority and minority. The corresponding regression tables are shown in the appendix. Compared to the Baseline, efficiency increases in Partisan Low by 6% and in Universal High by 12%. The efficiency level does not change for Partisan High or Universal Low.

The increase in efficiency has different distributional impacts for the majority and the minority as shown in the right panel of Figure 2.6. The increase in efficiency is distributed to the minority and the efficiency level does not change for the majority. The efficiency increases for the minority in Partisan Low by 7% and in Universal High by as much as 35%. The corresponding tables are shown in the appendix. This shows that different leaders with different abilities and different forms of messages have different impacts on both the total efficiency .

Figure 2.6: Efficiency across treatments compared to the Baseline



Regression estimates account for part fixed effects with robust standard errors clustered at the session level.

The level of inequality is also different in different treatments. Figure 9 shows the average payoffs of participants in all treatments for the majority and the minority. The blue bars show the average payoff for the minority and the red bars show the average payoffs for the majority. The red bars are always higher than blue bars in all treatments apart from Universal High where the blue bar is higher than the red bar, that is the average payoffs of minority participants is higher than the majority in Universal High. The minority participants make 169 points to 174 points on average in a round in all the treatments except Universal high where they make 194 points. Whereas the majority participants on average make points ranging from 196 points in Universal Low to as high as 203 points in Partisan High but earn 191 points in Universal High.

Figure 2.7: Average payoffs for majority and minority in all treatments

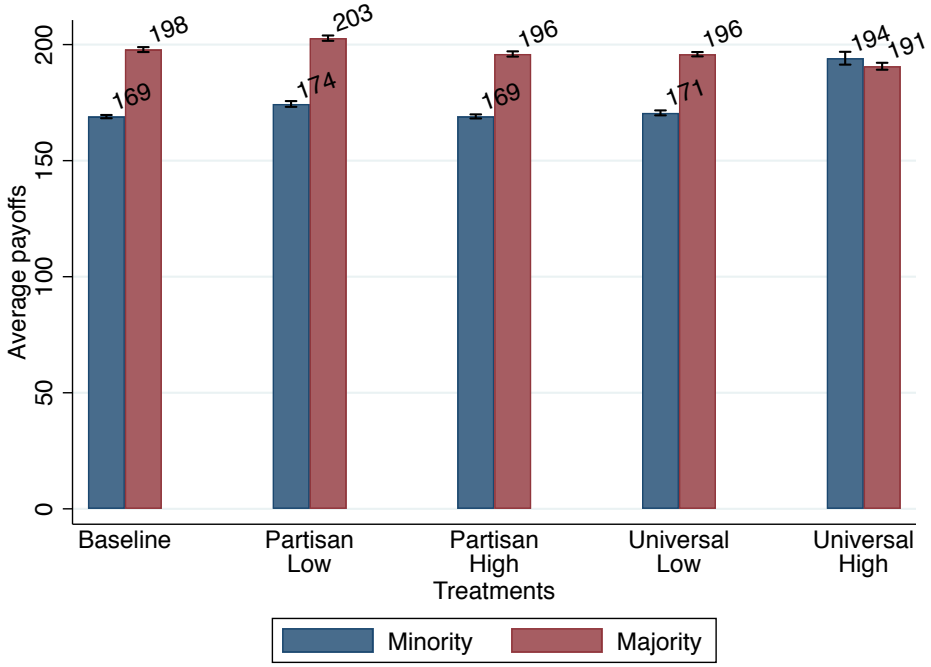


Table 2.12 shows the estimates from the regressions where the dependent variable is average payoffs in a round for the majority and the minority. The first column in the table shows the regression estimates for all the treatments together with Baseline as the reference category and the next five columns show the effects separately for all the treatments. The majority earns 28.8 points more than the minority in Baseline. This difference does not change in any treatment other than Universal High where the majority earns as much as the minority as shown both in column 1 and column 6 of the table. That is, in Universal High, the minority earns more than the majority by approximately 3.4 points. This is due to the fact that integration appears only in Universal High as shown in Result 4.

Table 2.12: Average payoffs across treatments

	(1) All Treatments	(2) Baseline	(3) Partisan Low	(4) Partisan High	(5) Universal Low	(6) Universal High
Majority	28.877***	28.877**	28.356	26.900	25.269*	-3.462**
	(3.952)	(4.591)	(9.886)	(13.470)	(2.182)	(1.449)
Majority in Partisan low	-0.521					
	(8.362)					
Majority in Partisan High	-1.977					
	(10.789)					
Majority in Universal Low	-3.608					
	(4.273)					
Majority in Universal High	-32.340***					
	(3.952)					
Observations	9456	2736	1920	1920	1920	960
R-squared	0.315	0.320	0.334	0.342	0.370	0.023
Reference category	Baseline					

Standard errors in parentheses

Dependent variable is the average payoffs of a player in a round.

Robust standard errors in parentheses clustered at the session level.

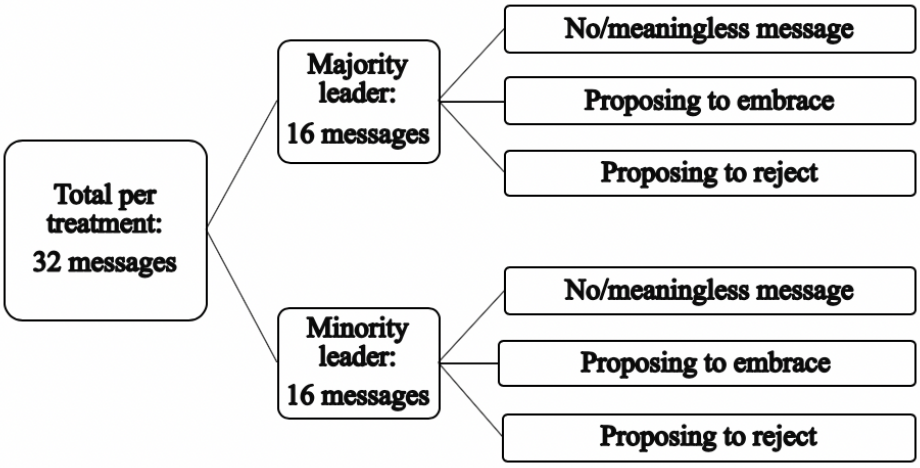
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Result 6: *Leader messages*

1. *The minority leaders propose to embrace more often than majority leaders in all treatments.*
2. *The high ability leaders belonging to the majority and the minority propose to reject the most when the message is partisan maximizing their own groups payoff.*
3. *The high ability leaders belonging to the majority and the minority propose to embrace the most when the message is universal maximizing societal payoff.*

A leader could send 8 messages in each session and each session consists of two societies with a leader belonging to the majority or to the minority. There were two sessions conducted for each treatment apart from Universal High, therefore there are 32 messages in a treatment that the leaders could have sent (16 in Universal high). Figure 2.8 visualizes the number of messages in each treatment, the number of messages from each leader and how the messages are divided for this analysis.

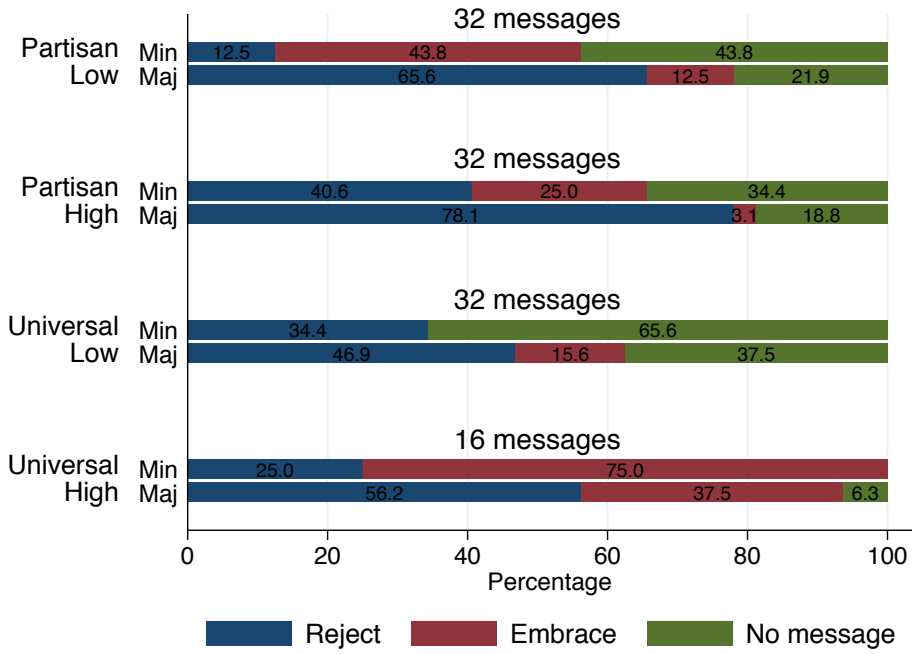
Figure 2.8: Message details for each treatment



Since the leaders were also allowed to choose to send a message or not, the content including the possibility to propose a strategy to the other participants, or anything else, the messages are divided into 3 types. The messages proposing to embrace, proposing to reject or there was no message sent or a meaningless message was sent. Figure 2.9 shows the percentage of the messages divided into the three types for the minority and majority leader separately in each treatment. All the messages which had the word

"YOUR COLOR" or the color that was assigned to the participant itself were coded as a proposal to reject and all the messages had the words white or do not choose your color are coded as a proposal to embrace.[4] The green bar shows the percentage of messages where there was no message sent by the leader, the red bar shows the percentage of messages in which the leader proposes to embrace and the blue bar shows the percentage of messages in which the leader proposes to reject. The top of the bar shows the total number of messages in each treatment. Since there was only one session in Universal High, the total number of messages is 16 for majority and minority each. The rest of the treatments had 32 messages in each treatment for minority as well as majority.

Figure 2.9: Leader messages



The leaders belonging to the majority sent more messages proposing an action than the leaders belonging to the minority irrespective of the treatment apart from the treatment Universal High. The green bar in all treatments for the majority is smaller than the green bar in the minority. Only in the treatment Universal High the minority leaders sent a message whenever possible and the majority leader did not send a message only in one round. The leaders belonging to the majority proposed to reject more than the

4 I do this coding manually.

leaders belonging to the minority. The blue bar is always higher for the majority. The majority leaders proposed to reject in 65.6% of the messages in Partisan Low, in 78.1% of the messages in Partisan High, in 46.9% of the messages in Universal Low and in 56.2% of the messages in Universal High. Whereas, the leaders belonging to the minority proposed to reject only in 12% of the messages in Partisan Low, in 40.6% of the messages in Partisan High, in 34.4% of the messages in Universal Low and only in 25% of the messages in Universal High.

The high ability leaders in Partisan message proposed to reject the highest number of times for both minority and majority. This shows that when the leaders are of high ability and there is an ingroup message, the leaders try to maximize their group payoffs and propose to reject as much as possible. Whereas with high ability leaders and universal message the percentage of messages proposing to embrace increases for both minority and majority. 75% of the messages from minority leaders and 37.5% of the messages from the majority leaders proposed to embrace in Universal High.

2.5 Conclusion

This paper studies a repeated cultural adaptation game between two types of participants with different cultural norms. Two-thirds of the participants are one type and one-third are of the other type. The players must choose between following own cultural norms with no adjustment, that is rejecting the other culture or adapting to the other cultural norms, that is embracing the other culture. The key aspect of the game is that the players face a trade-off between coordinating with same type players where rejecting is a dominant strategy and cooperating with the other type players where embracing is the dominant strategy. The parameters of the game were designed in such a way that the game predicts multiple Nash equilibria where it is socially efficient for both the minority and the majority to embrace.

In the baseline scenario, the participants belonging to the majority always tend reject and follow own cultural norms. Whereas the minority tends to reject and embrace with equal likelihood. This leads to either assimilation or segregation which leads to lower efficiency and higher levels of inequality between the two types. To improve efficiency, I introduce a possibility of communication where there is a leader appointed from both the minority and the majority with different ability and can send a message to either same type participants or all participants irrespective of the type. In Partisan High treatment, the leader is of high ability and can send a message only to the same type participants.

Similarly, in Partisan Low treatment the leader is of low ability and can send a message only to the same type participants. In Universal High the leader is of high ability and can send a message to all the participants irrespective of the type. Similarly, in Universal Low the leader is of low ability and can send a message to all the participants irrespective of the type.

The results suggest that having a leader reduces the rejection rate for the majority and the minority but is dependent on the ability of the leader and the kind of message. In all treatments the rejection rate for the majority was ranging from 87% to 95% whereas in Universal High it reduces to 51% (Result 1). As far as the minority is concerned having a leader increases the rejection rate in some treatments and decreases in other treatments. In the Baseline the rejection rate of minority was 57% and it increases to 74% in Partisan High and reduces to 39% in Universal high (Result 1). Having a leader also improves within group coordination from the baseline (Result 2). The coordination rate increases for both the minority and the majority in all treatments with a leader. This increase in coordination also leads to an increase in efficiency with a leader, that is the participants earn more when there is a leader for both the majority and the minority (Result 4). Although the levels of inequality differ in different treatments with majority always earning higher than the minority. The inequality remains the same in all the treatments except in Universal High where the minority earns relatively higher than the majority (Result 4). Since a leader improves coordination within the types, this also improves the equilibrium frequency, that is there are less number of people deviating from an equilibrium in a round when there is a leader present (Result 3). Furthermore, the only treatment where mutual adaptation occurs is Universal High which also leads to the highest level of efficiency (Result 3 and Result 4).

This experimental study reveals that groups with different cultures coming into constant contact with each other maybe able to cooperate with each other if the groups have leaders with high abilities and they send a message to all the participants in the population and not just their own group members. Additional experiments may corroborate this conclusion and give further insights into how different ways of communication may help in achieving a better outcome in a society where there are groups of different cultures co-residing and how we can take advantage of cultural diversity by embracing other cultural norms and practices.

Appendix

Table 2.13: Payoffs of player $i \in \{A, B\}$ under pure strategy Nash equilibria

		Every player $i \in B$ (Majority)	
		r	e
Every player $i \in A$ (Minority)	r	RR (Segregation) $N[20(pN-1)+14(1-p)N]$ $N[20[(1-p)N-1)]+14pN]$	RE (Accommodation) $N[20(pN-1)+20(1-p)N]$ $N[16[(1-p)N-1)]+16pN]$
	e	ER (Assimilation) $N[16(pN-1)+16(1-p)N]$ $N[20[(1-p)N-1)]+20pN]$	EE (Integration) $N[16(pN-1)+22(1-p)N]$ $N[16[(1-p)N-1)]+22pN]$

2.A Mann-Whitney and Epps-Singleton tests

Table 2.14: Mann-Whitney tests for rejection rates

Treatment1	Treatment2	Proportion	n1	n2	pvalue
Baseline	Partisan High	Minority	912	640	0
Baseline	Partisan High	Majority	1824	1280	0.362
Baseline	Partisan Low	Minority	912	640	0
Baseline	Partisan Low	Majority	1824	1280	0
Baseline	Universal High	Minority	912	320	0
Baseline	Universal High	Majority	1824	640	0
Baseline	Universal Low	Minority	912	640	0
Baseline	Universal Low	Majority	1824	1280	0

Table 2.15: Epps-Singleton tests for rejection rates

Treatment1	Treatment2	Proportion	Pvalue
Baseline	Partisan High	Minority	6.00e-05
Baseline	Partisan High	Majority	0.173
Baseline	Partisan Low	Minority	0.000220
Baseline	Partisan Low	Majority	0
Baseline	Universal High	Minority	0
Baseline	Universal High	Majority	0
Baseline	Universal Low	Minority	0
Baseline	Universal Low	Majority	0.000310

Table 2.16: Mann-Whitney tests for coordination rates

Treatment1	Treatment2	Proportion	n1	n2	pvalue
Baseline	Partisan High	Minority	228	160	0.190
Baseline	Partisan High	Majority	228	160	0.0927
Baseline	Partisan Low	Minority	228	160	0.103
Baseline	Partisan Low	Majority	228	160	0.0464
Baseline	Universal High	Minority	228	80	0.000200
Baseline	Universal High	Majority	228	80	0.0998
Baseline	Universal Low	Minority	228	160	0.961
Baseline	Universal Low	Majority	228	160	0.0509

Table 2.17: Epps-Singleton tests for coordination rates

Treatment1	Treatment2	Proportion	Pvalue
Baseline	Partisan High	Majority	0.0824
Baseline	Partisan Low	Majority	0.333
Baseline	Universal High	Majority	0.412
Baseline	Universal Low	Majority	0.235

I show the results only for majority as there are very few observations for minority.

Figure 2.10: Average rejection rate for majority and minority in all treatments for part 2 and part 3.

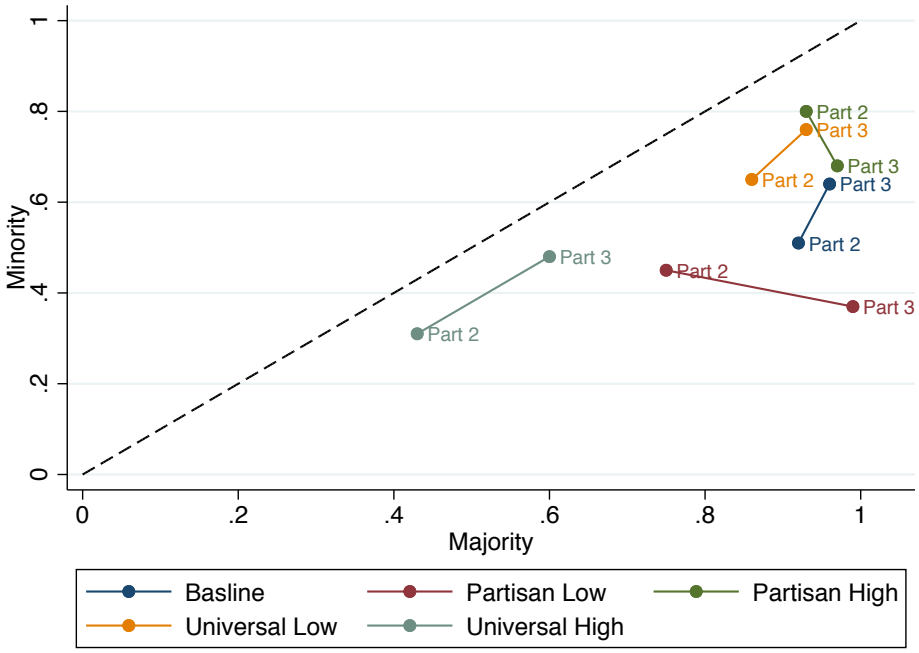


Table 2.18: Efficiency

	(1) Total efficiency	(2) Minority efficiency	(3) Majority efficiency
Partisan Low	0.067***	0.078*	0.066
	(0.020)	(0.038)	(0.077)
Partisan High	-0.008	0.001	-0.022
	(0.020)	(0.051)	(0.096)
Universal Low	0.005	0.023	-0.023
	(0.020)	(0.019)	(0.045)
Universal High	0.121***	0.364***	-0.090*
	(0.026)	(0.009)	(0.045)
Observations	1696	788	788
R-squared	0.080	0.225	0.083

Standard errors in parentheses

Dependent variable is efficiency of minority or majority.

Robust standard errors in parentheses clustered at the session level.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

2.B Instructions

The instructions were read out in English as well as Hindi. The game was explained on the board for a better comprehension. The instructions were same for all the treatments apart from the leader text which is shown at the end. All the instructions were color specific and were distributed according to the colors that were assigned to the participants. I also gave something called earnings tables to the participants showing all the possible payoffs/earnings based on the choices of other participants. It was explained to the participants how to read the earnings tables. An example of earnings tables for both part 1 and part 2 are shown in the end.

The instructions were divided into 3 parts. In the first part the subjects were informed about the game structure and the points they can earn and how we treat the data which is given below:

2.B.1 Instructions (Page 1)

Welcome! You are now taking part in a decision experiment.

You will be paid in cash at the end of the experiment for your participation in today's session. In the course of the experiment you will receive points. Your earnings depend on how many points you receive at the end:

$$25 points = Rupee 1$$

All participants are paid out privately so that other participants cannot see how much they have earned.

Your choices affect your own earnings and the earnings of other participants. All interactions between you and other participants will be anonymous. Neither your name nor the names of others will be disclosed. We also only use anonymous data for the analyses.

Before continuing, it is important that you know the following:

Color: At the beginning of the experiment, the computer will randomly assign a color to you. BLUE or RED. There are 24 people in this room. 12 people will have the color BLUE and 12 people will have the color RED. The other participants do not know your color. Keep this information to yourself and do not share the information about your color with anyone.

The assigned colors do not change during the experiment.

Duration: The experiment is divided into 2 parts. Part 1 lasts 6 rounds and Part 2 lasts 40 rounds.

Group: At the beginning of each part all persons in this room are divided into two groups of 12 persons each. The way in which the people are divided into groups is explained at the beginning of each part. During each part you will only interact with the people in your group. These interactions determine your points.

At the beginning of each part there is are practice questions to ensure that you understand the instructions well. The 3 people of each color who answer the best will receive an additional Rs.100 in the final earnings.

The computer will now assign you a color. We will then give you the instructions for Part 1.

After these instructions were explained the participants were given the instructions for part 1 according to their color.

2.B.2 Instructions for Part 1

Group: In this part all persons who have BLUE are in one group and all persons who have RED are in the other group.

Your task:

Each participant chooses between two actions:

$$\text{“}YOUR COLOR\text{”} and \text{“}WHITE COLOR\text{”}$$

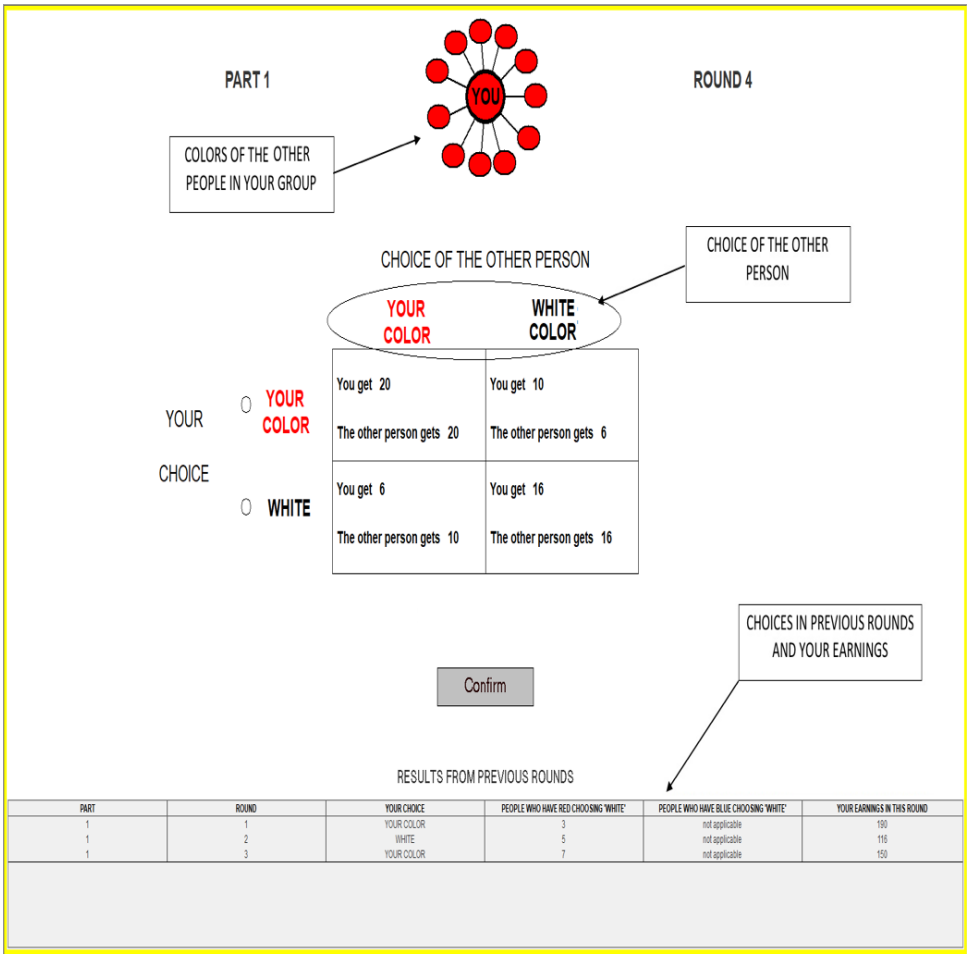
First, let's look at how you earn points with a single pairwise comparison :

The table in the decision screen shows you the possible earnings from a single comparison. There are four possible combinations depending on your choice ("YOUR COLOR" or "WHITE COLOR") and the choice of the other person ("YOUR COLOR" or "WHITE COLOR").

1. If you choose "YOUR COLOR" and the other person chooses "YOUR COLOR", you receive 20 points and the other person receives 20 points.
2. If you choose "WHITE COLOR" and the other person chooses "YOUR COLOR", you receive 6 points and the other person receives 10 points.
3. If you choose "YOUR COLOR" and the other person chooses "WHITE COLOR", you receive 10 points and the other person receives 6 points.
4. If you choose "WHITE COLOR" and the other person chooses "WHITE COLOR", you receive 16 points and the other person receives 16 points.

To enter your choice, highlight the line next to "YOUR COLOR" or "WHITE COLOR" by clicking anywhere in the table. If you click, the line will be highlighted. You can change your choice before clicking the "Confirm" button. If you are satisfied with your choice, please click on "Confirm".

Figure 2.11: Choice screen: The figure below shows the choice screen displayed at the beginning of each round.



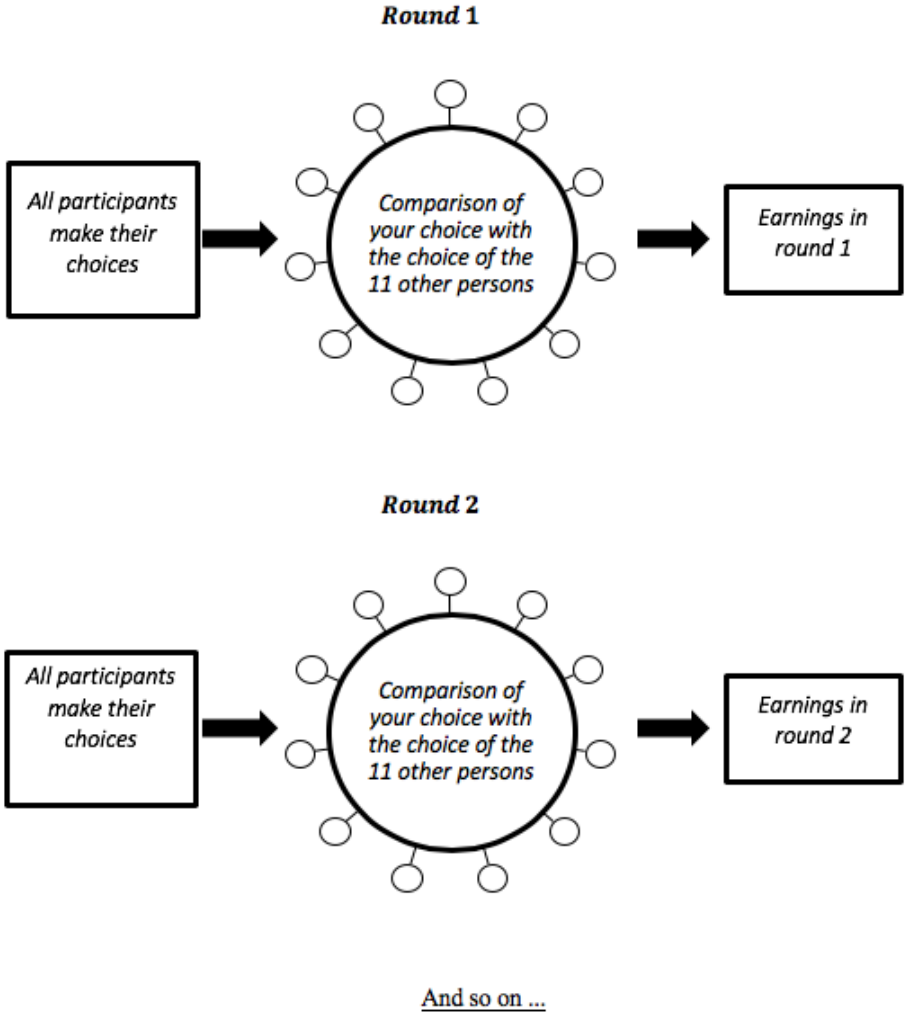
Your task in each of the 6 rounds has the following sequence (as illustrated in the figure):

- Each participant chooses between two actions:

$$\text{“}YOURCOLOR\text{”} and \text{“}WHITECOLOR\text{”}$$

- Your choice is compared one by one in pairs with the choices of other 11 people in your group. That is, if you have the color BLUE, your choice will be compared one by one with the choice of the 11 other people who have BLUE (that is, 11 comparisons), and if you have RED, your choice will be compared one by one with the choice of the 11 other people who have RED (that is, 11 comparisons).
- Each comparison with another person generates points for you and for the other person.
- At the end of each round, your earnings are equal to the sum of the earned points from all 11 pairwise comparisons.

Please remember that you can choose "YOUR COLOR" or "WHITE COLOR" at the beginning of each round. Once you and all other people in your group have confirmed their choice, that choice will apply to all 11 comparisons in the round.



And so on ...

Your earnings from a round

Your earnings in one round are equal to the sum of the points earned from all 11 comparisons. After all the people in your group have confirmed their choice, the results of the round will appear on the results screen. The results screen (see below) will show the following:

- Your choice
- The choices of the 11 other people in your group
- Your points from all comparisons

- Your earnings in the current round (the sum of the points you received from all comparisons)

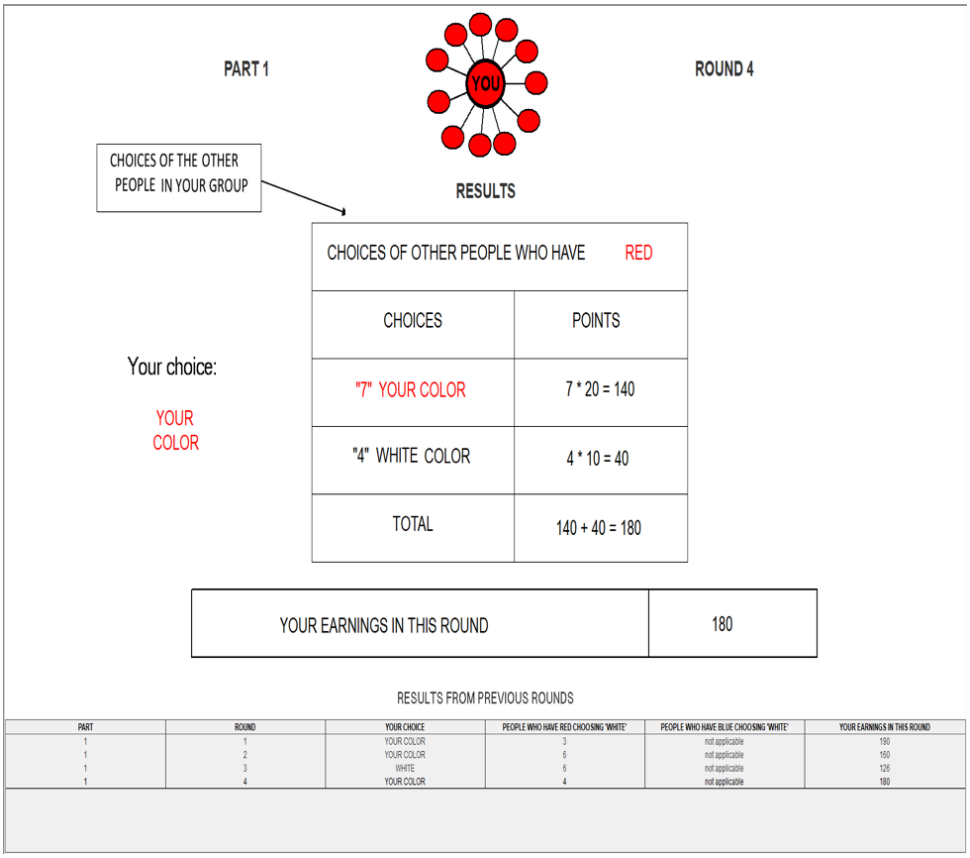
To explain the table in the result screen, we use an example with randomly selected choices. In the example, the result screen shows that 7 people selected "YOUR COLOR" and 4 people selected "WHITE COLOR".

Based on your choice of "YOUR COLOR", your earnings are:

1. Points from the comparisons with people who also chose "YOUR COLOR": You receive 20 points from each comparison, i.e. 7*20=140 points.
2. Points from the comparisons with people who have chosen "WHITE COLOR": You receive 10 points from each comparison, i.e. 4*10=40 points.

Therefore, your total earnings are: 140+40=180 points.

Figure 2.12: Results screen:



Earnings tables:

We have provided you with tables that show the earnings from a round depending on your choice and the choices of the 11 other people in your group. The tables are given to you according to your color.

How to read the table:

1. Select the relevant table according to your choice. Look at the upper table if you chose “YOUR COLOR” and the lower table if you chose “WHITE COLOR”.
2. Suppose you have selected “YOUR COLOR” (upper table). If no other person in your group has chosen “WHITE COLOR”, your earnings are 220 points. The reason is that for each comparison you receive 20 points, i.e. 11*20 equals 220. You can see this in the column ”0” in the upper table. If 4 persons have chosen “WHITE COLOR”, your earnings are 180 points, as you can see in the upper table in column ”4”. You earn 180 points because you receive 7*20=140 points from comparisons with 7 people who chose ”YOUR COLOR” and 4*10 = 40 points from comparisons with 4 people who chose “WHITE COLOR”.

At the bottom of the choice screen and on the results screen, you can see a summary of the results of previous rounds. Before you make your choice, you can see all the results of previous rounds by scrolling up. The table shows your previous choices, the number of people in your group who have chosen ”WHITE COLOR” in previous rounds and your earnings in all previous rounds.

Any questions?

If you have any questions after reading the instructions carefully, please raise your hand and remain seated. The experimenter will come to you.

When you have understood everything, you can start the quiz on the screen.

2.B.3 Instructions for part 2

Group: In this part 4 randomly selected persons from each group are assigned to the other group. Accordingly, one group will consist of 8 people who have BLUE and 4 people who have RED, and the other group will consist of 8 people who have RED and 4 people who have BLUE.

Duration: This part is again divided into two parts. Each part lasts 20 rounds.

Comparisons: Your choice will again be compared one by one in pairs with the choices of the 11 other people in your group, but some other people in your group will have RED and some other people will have BLUE. For example, if you have BLUE and you are in the group where 8 people have BLUE and 4 people have RED, your choice will be compared one by one with the 7 other people who have BLUE and the 4 other people who have RED.,ÄÉ

Choices: As in Part 1, you will receive points from each pairwise comparison. Since your choice is now also compared with the choices of people who have the other color, the points you get depend on...

- your choice (“YOUR COLOR” or “WHITE COLOR”),
- the color that the other person has,

- and the choice of the other person ("YOUR COLOR"/"OTHER COLOR" or "WHITE COLOR").

As previously, "YOUR COLOR" or "WHITE COLOR" can be selected. The color that is not your own cannot be selected.

Now we will look at how you earn points in a single pairwise comparison:

If the other person has the same color:

The left table in the choice screen shows your possible points from a comparison with a person who has the same color. As in part 1, there are the same four possible combinations.

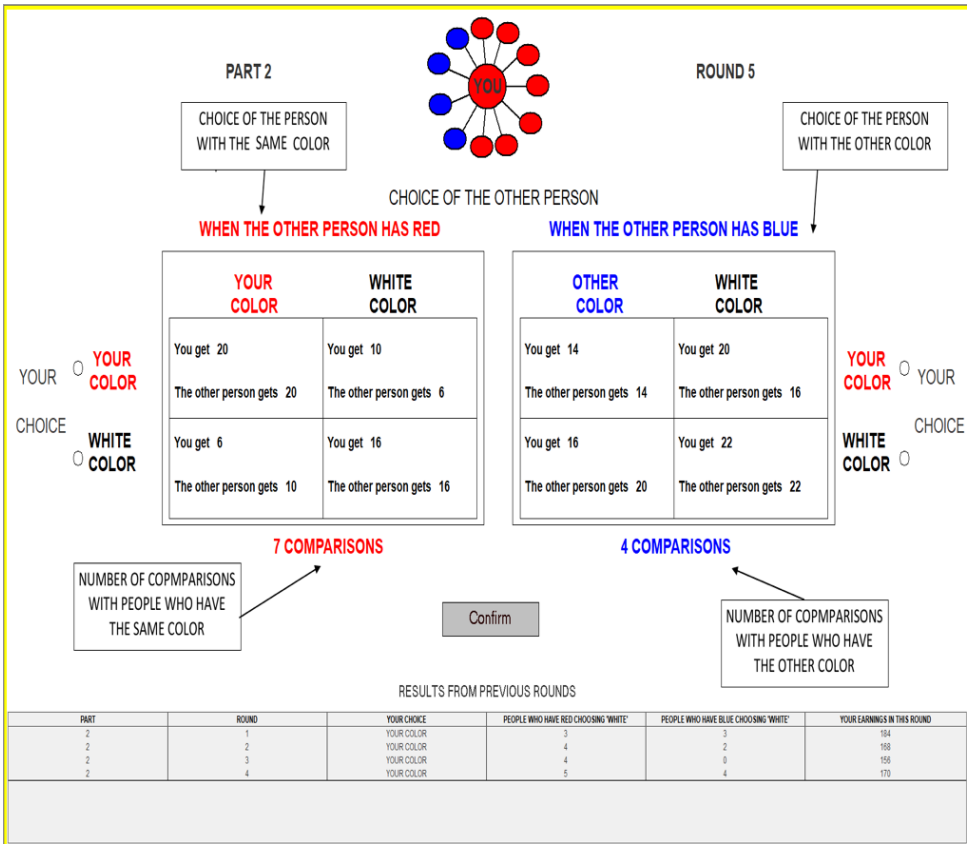
1. If you choose "YOUR COLOR" and the other person chooses "YOUR COLOR", you receive 20 points and the other person receives 20 points.
2. If you choose "WHITE COLOR" and the other person chooses "YOUR COLOR", you receive 6 points and the other person receives 10 points.
3. If you choose "YOUR COLOR" and the other person chooses "WHITE COLOR", you receive 10 points and the other person receives 6 points.
4. If you choose "WHITE COLOR" and the other person chooses "WHITE COLOR", you receive 16 points and the other person receives 16 points.

If the other person has the other color:

The right table in the choice screen shows your possible points from a comparison with a person who has the other color. There are four possible combinations depending on your choice ("YOUR COLOR" or "WHITE COLOR") and the other person's choice ("OTHER COLOR" or "WHITE COLOR").

1. If you choose "YOUR COLOR" and the other person chooses "OTHER COLOR", you receive 14 points and the other person receives 14 points.
2. If you choose "WHITE COLOR" and the other person chooses "OTHER COLOR", you receive 16 points and the other person receives 20 points.
3. If you choose "YOUR COLOR" and the other person chooses "WHITE COLOR", you receive 20 points and the other person receives 16 points.
4. If you choose "WHITE COLOR" and the other person chooses "WHITE COLOR", you receive 22 points and the other person receives 22 points.

Figure 2.13: Choice screen: The following figure shows an example of the choice screen displayed at the beginning of each round.



Your earnings after one round:

As in Part 1, your earnings for the round are the sum of the points earned in each pairwise comparison.

To explain the table in the result screen, we use an example with randomly selected choices. In the example the result screen shows that of the 7 people who have the same color as you, 6 have chosen "YOUR COLOR" and 1 has chosen "WHITE COLOR". Of the 4 people who have the other color, 2 people have chosen "OTHER COLOR" and 2 people have chosen "WHITE COLOR".

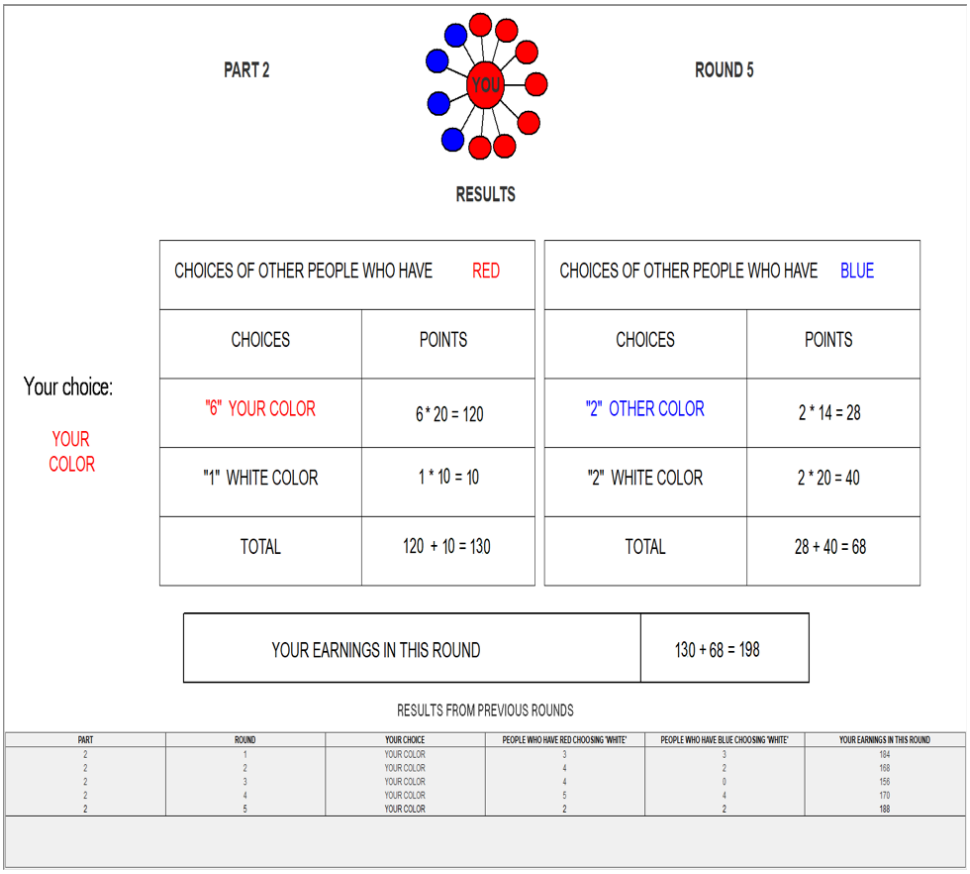
Based on your choice of "YOUR COLOR", your earnings are:

1. Points from the comparisons with people who have the same color and have chosen "YOUR COLOR": You will receive 20 points from each comparison, that is 6*20=120 points.
2. Points from the comparisons with people who have the same color and have chosen "WHITE COLOR": You will receive 10 points from each comparison, that is 1*10=10 points.

3. Points from the comparisons with people who have the other color and have chosen "OTHER COLOR": You will receive 14 points from each comparison, that is 2*14=28 points.
4. Points from the comparisons with people who have the other color and have chosen "WHITE COLOR": You will receive 20 points from each comparison, that is 2*20=40 points.

Therefore, your total earnings are: 120+10+28+40=198 points.

Figure 2.14: Results screen



Earnings table:

Now we have provided you with new tables that contain both the choices of the people in your group who have the same color and the choices of the people who have the other color.

How to read the table :

1. Select the relevant tables according to the number of people in your group who have the same color and the number of people in your group who have the other color.

2. To understand the table, please first assume that 7 other people in your group have the same color as you. All people who have BLUE please look at the tables, with 7 other people who have BLUE and 4 other people who have RED. All people who have RED please look at the tables with 7 other people who have RED and 4 other people who have BLUE.
3. Select the relevant table according to your choice: Upper table for "YOUR COLOR" and lower table for "WHITE COLOR".
4. Suppose you have chosen "YOUR COLOR" (upper table). If no one who has the same color has chosen "WHITE COLOR" and no one who has the other color has chosen "WHITE COLOR", your earnings are 196 points. The reason is that from each pairwise comparison with a person who has the same color you get 20 points, so 7*20=140 and 14 points from each pairwise comparison with a person who has the other color, so 4*14=56. The total points you get is 140+56=196 points. You can see this from the "0" column and the "0" row in the upper table.

   If 3 people who have the same color have chosen "WHITE COLOR" and 2 people who have the other color have chosen "WHITE COLOR" your earnings are 178 points as you can see from the "3" column and the "2" row in the table. You earn 178 points because...

   - you will receive 4*20=80 points from the comparisons with 4 people who have the same color and have chosen "YOUR COLOR" and 3*10=30 points from the comparisons with 3 people who have the same color and have chosen "WHITE COLOR".
   - you get 2*14=28 points from the comparisons with 2 people who have the other color and have chosen "OTHER COLOR" and you get 2*20=40 points from the comparisons with 2 people who have the other color and have chosen "WHITE COLOR".

DO YOU HAVE ANY QUESTIONS BEFORE WE START? _____

When you have understood everything, you can start the quiz on the screen.

2.B.4 Leader text

Apart from these instructions based on the treatment the participants were also given instructions on how the leader can send a message to everyone or their own color participants. Below are the instructions:

Speaker :

In this part, 2 speakers in each group are selected: One speaker for each color. Therefore, in each group 1 speaker will be RED and 1 speaker will be BLUE. You will be informed at the beginning of this part if you have been assigned the role of speaker.

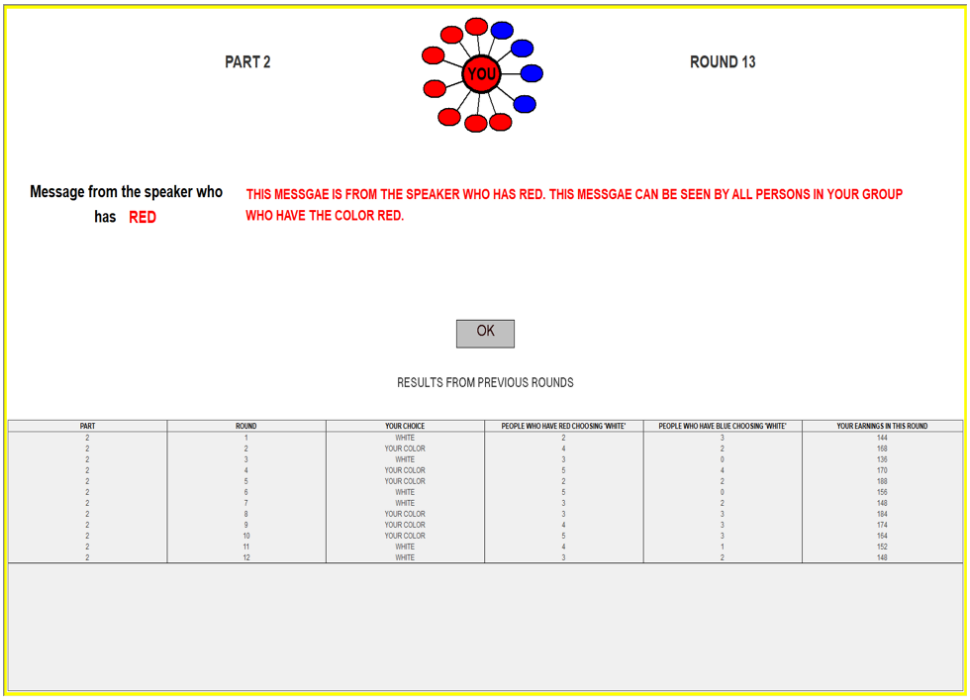
The speaker has the option to send a message to his or her own group. The message can be sent at the beginning of every fifth round, i.e. at the beginning of round 1, round 6, round 11 and so on. During these communication rounds the speakers are asked to use the keyboard to enter the message.

If you are the speaker, the message you send may contain anything you like, including what you think is the best approach to the experiment, what you intend to do, or what others should do. However, there are three limitations to the content of the messages you can send: First, you must not send a message that identifies you to other group members. So, you can't use your real name, nickname, or self-description of any kind ("Rahul here," "I'm the guy in the red shirt sitting in the front row," "It's me, Pooja, from the computer class," or "As a woman, I think..."). The second limitation is that the message must not contain any threats or promises relating to the time after the experiment. The third limitation is that the message must not be longer than 200 characters. You will get 40 seconds to write the message.

The message screen shows an example of how the message appears.

Partisan treatments In the partisan treatments the following screen was given with the message below:

Figure 2.15: Message screen Partisan

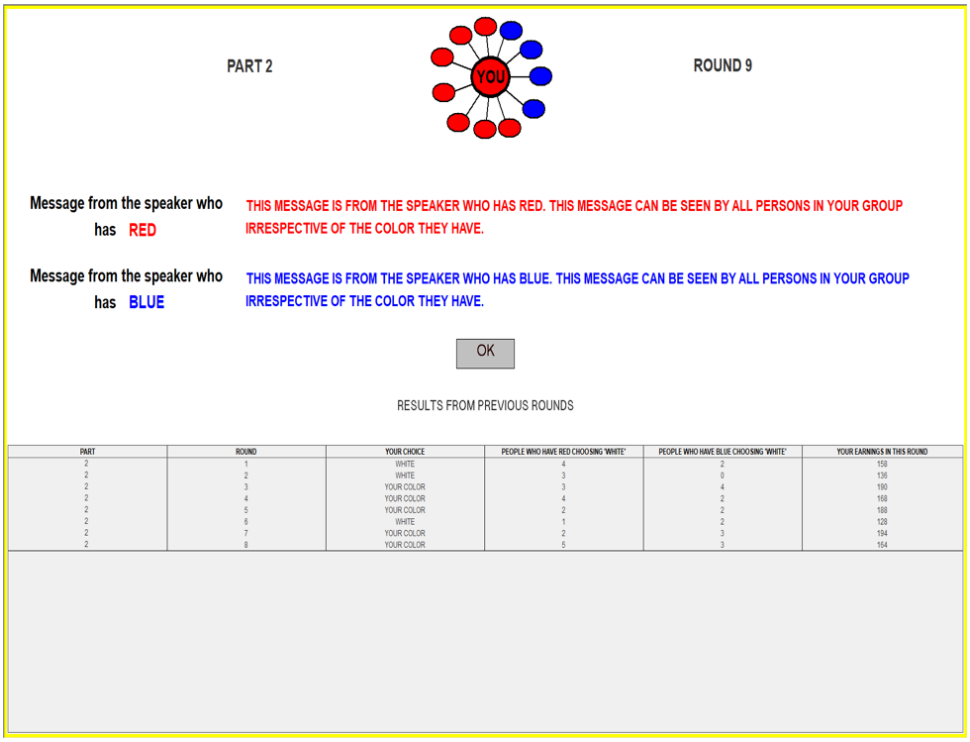


Any message sent to the other group members will appear only on the screens of people who have the same color as the speaker and are in the same group (but not on the screens

of group members who have the other color, nor on the screens of people in the other group).

Partisan treatments Similarly for Universal message a different screen and the message was given to the participants

Figure 2.16: Message screen Universal



Any message sent to the other group members will appear on the screens of all members of your group (but not on those of the other group members). The color of the speaker appears before the message.

3

Host country characteristics and cultural integration of immigrants: A literature review

3.1 Introduction

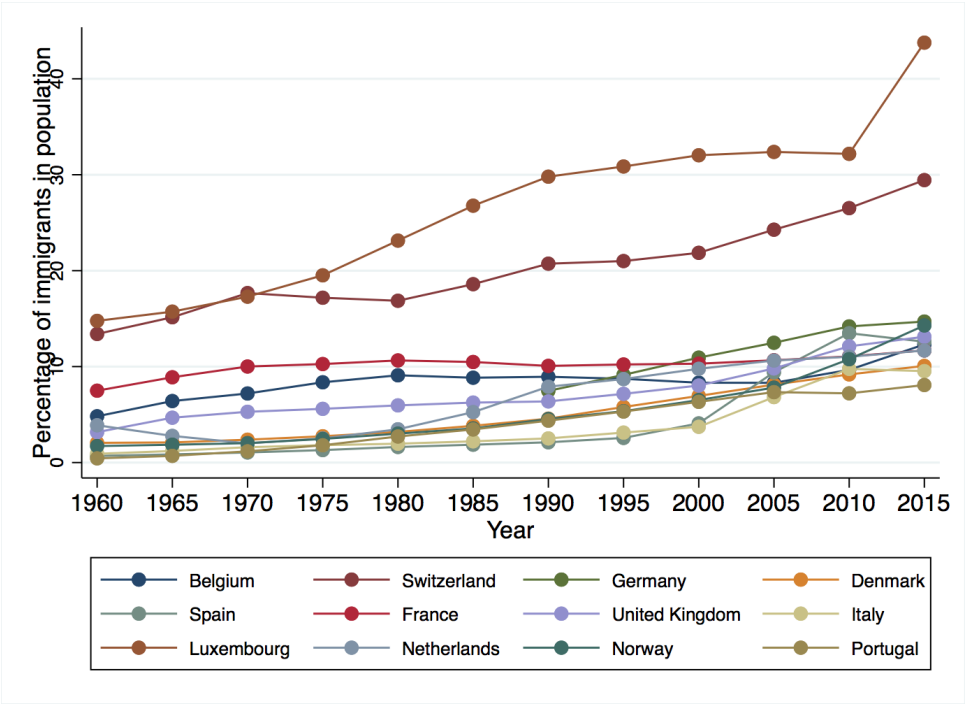
The immigration flows have been increasing continuously over the past few decades with the technological revolution and with countries opening up their trade barriers. Figure 3.1 shows the percentage of immigrants of the total population in twelve of the European countries with high proportion of immigrants. For instance, there has been a sharp increase in the percentage of immigrants in the total population rising from 15% in 1960 to 30% in 2015 Switzerland. This increase in the number of immigrants has led to a debate on the costs and benefits of immigration, that is if immigration is an opportunity to the host country to benefit from it or a threat. This debate has both economic and cultural aspects. That is if the immigrants take away jobs from the natives is at the forefront of the debate in countries like United Kingdom while if immigrants with different cultural practices, norms and traditions are considered a cultural threat as is the case of France. On the other hand, immigrants tend to create more jobs, specifically high skilled immigrants, and cultural diversity leads to increases in productivity, growth, and innovation (Ashraf & Galor 2013). Cultural diversity may lead to higher creativity, integrative and cognitive complexity, better health outcomes and positive inter-group attitudes (Benet-Martinez 2006; Maddux & Galinsky 2009; Schofield 1991; Tadmor et al. 2009). But it also may lead to lower levels of public good provision and higher possibility of conflict (Easterly & Levine 1997; Humphreys et al. 2009; Miguel & Gugerty 2005). In this literature review, I focus on the cultural aspect of immigration, specifically on the possible host country characteristics that may affect the acculturation strategies and integration patterns of immigrants. This is very important to understand the dynamics of integration since it

is a dyadic process and both the actors, the immigrants (along with the home country characteristics) and the natives (including the host country characteristics) may equally affect the acculturation patterns of both immigrants as well as natives. Although, in this review, I focus only the acculturation patterns of immigrants.

During the last century, economists mainly focused on the labor market integration of immigrants, the effects of immigrants on natives' labor market outcomes, the effects on public good provisions, economic growth, and productivity. However, for the last two decades, economists have started concentrating on the cultural and socioeconomic integration of immigrants which may have direct or indirect impact on labor market, growth, innovation, productivity etc. For example, cultural integration of immigrants may affect the variety of goods available in an economy. That is, immigrants maintaining their cultural practices and consumption patterns leads to an increase in the variety of goods (Zukin 1998) which increases the welfare based on the love for variety of goods (Dixit & Stiglitz 1977). At the same time, cultural threat may affect the cooperation levels and trust (Cameron et al. 2015) which form an important part of the production function (Wintrobe & Breton 1986), or a higher possibility of conflict (Easterly & Levine 1997; Montalvo & Reynal-Querol 2005). On the other hand, if immigrants tend to assimilate into the host community mainstream culture, it may lead to low levels of conflict but, among other things, may reduce the number of varieties available for consumption, reduce the fertility rates of immigrants which affects the already ageing population of the western world etc. Therefore studying acculturation[1] patterns of immigrants is of paramount importance in today's world for individual behavior as well as public policy.

1 Acculturation is defined as the process of social, psychological and cultural change due to a constant interaction between different cultures. In economics, usually the term integration is used however, integration is one of the strategies of acculturation defined in cross cultural psychology. Therefore, I use acculturation here to define these changes.

Figure 3.1: Percentage of immigrants in the population



Source: Authors own calculations using the data from Eurostat

There are different dimensions in which acculturation patterns could be measured and all these dimensions have different implications on both the natives as well as the immigrants. However, the process or the perspectives on acculturation also differ in different disciplines. Before I define the measures of acculturation in different dimensions, it is important to understand the already defined theoretical perspectives. There are four kinds of theoretical frameworks of cultural integration.[2] The first perspective is assimilation where diverse cultural groups melt into the main stream culture promoting a homogeneous culture mostly consisting of the majority or the host country cultural practices. This framework is followed in economics literature where the reduction in differences in the different dimensions and indicators which are affected by culture is through immigrants adjusting to the native levels. The second perspective is multiculturalism where multiple cultures coexist. This perspective has been researched in detail in cross-cultural psychology following Berry (1997) where the adjustment is by both the migrants as well as the natives. There can be different kinds of multicultural societies where the diverse cultures live cooperatively and different cultures are appreciated, or diverse cultures could

2 Algan et al. (2013) has a detailed explanation of these perspectives.

be segregated in daily life activities as well as geographically. The third kind of perspective is called structuralism which focuses on how the integration of immigrants is affected by the host country characteristics like the social structures or the integration policies and the last perspective is segmented assimilation where immigrants integrate economically into the mainstream culture however maintain own values and identity (Portes & Zhou 1994), for instance learning the language for economic benefits however marrying strictly within own culture.

Measures of acculturation

As already mentioned, most of the empirical literature in economics follows the assimilation perspective where immigrants adjust or assimilate into the mainstream or majority culture. Immigrants are considered assimilated in the host countries if the differences between immigrants and natives based on the cultural indicators are minimized. These indicators have been researched extensively in different disciplines in explaining the assimilation patterns of immigrants. The same indicators are used also in other disciplines like cross-cultural psychology however, the multiculturalism approach is used, where the immigrants and the native's acculturation patterns play a crucial role in explaining the hybrid culture that emerges which has aspects of either or both cultures. These indicators include demographic indicators such as fertility choices, divorce rates, age at first birth, educational achievement, gender gaps in education which differs across cultures. For example, the age of marriage is lower than 18 in many African and Asian countries where as in the Western countries it is higher (Jensen & Thornton 2003), fertility rates also differ across countries with countries like Nigeria and Somalia having the highest fertility rates and countries like Spain and Italy with also one of the lowest fertility rates (based on the world bank data). The divorce rates vary a lot between countries with countries like Sri Lanka and Vietnam having one of the lowest crude divorce rates and countries like Denmark and United States with the highest divorce rates (based on the United Nations Statistical Division (UNSTAT), 2011). Similarly, preferences also differ across countries such as the trust levels are high in protestant European countries and low in Islamic countries (Inglehart 2006). Risk preferences, time preferences, social preferences also differ across cultures (Falk et al. 2018). The traditional values also differ across cultures as presented in the cultural map introduced by Inglehart (2006) where traditional values such as religiosity, the gender roles like low female labor force participation, family ties etc. are higher in Islamic countries like Nigeria and lower in protestant European countries including Germany and Finland. Also, the levels of civic participation are higher in protestant European countries and lower in Islamic countries.

There are a number of studies who have used these indicators to show the acculturation patterns of immigrants in different destination countries. For example, Adsera & Ferrer (2014); Furtado et al. (2013); Gathmann & Keller (2017) use the socio-demographics to check the acculturation patterns of immigrants. Cameron et al. (2015); Luttmer & Singhal (2011) check the changes in preferences showing that Islamic immigrants show lower levels of trust compared to other immigrants. For example, if the share of education an individual receives in the West is higher, it has a strong negative impact on altruism, trust towards individuals of Chinese ethnicity, and trustworthiness, while it has a significant and positive impact on trust towards Australians (Cameron et al. 2015). Algan et al. (2013); Bisin & Verdier (2000); Bisin et al. (2011); Fernandez & Fogli (2009) analyze the acculturation patterns in terms of traditional values such as religious practices and female labor force participation. They show that Muslim immigrants tend to follow their own cultural practices and tend not to integrate into the host country cultural practices in England. Avitabile et al. (2013, 2014) focus on the language spoken at home by immigrants, Wright & Bloemraad (2012); Aleksynska (2011) look at the civic participation of immigrants which also shows that Islamic immigrants show the least civic participation as compared to other immigrants.

Although these indicators show the acculturation outcomes among immigrants which are diverse, but they are not random. They depend on the interplay between individual, family, community, and societal factors, which are linked to unique contexts of exit and reception (Zhou & Xiong 2005). This review therefore combines the assimilation and the structuralist approach in the three dimensions shown in Table 3.1. The first dimension is concentrating on the immigrants including factors such as size of the cultural group in the population, the levels of spatial segregation, ethnic enclaves, the degree of group sanctions or the role of identity or ethnic fractionalization. The second dimension is the native's attitudes towards diversity or tolerance as well as the belief that immigrants bring a cultural threat to the community. These factors are from the native's perspective which may affect the immigrant's acculturation strategies in terms of maintaining their own cultural practices and learning the new host country traditions and customs. The third dimension is the institutions in the host country and how they support the integration of immigrants. For example, France might be classified as essentially assimilationist and Britain as multicultural, whereas the Netherlands and Germany might be seen as somewhere between the two. This also causes the immigrants to integrate or assimilate differently in these host countries. The immigrants' home country cultural practices also play a crucial role in the acculturation patterns of immigrants. Studies in the US have shown that trust of immigrants to a large extent is stable and enduring over multiple

generations however in Europe recent studies have shown that immigrants from low-trust countries to a considerable extent adapt to the high trust levels of natives in their new country (Dinesen 2012).

Table 3.1: Factors affecting cultural adaptation

Dimension	Indicators	Empirical studies	Theoretical studies
Immigrants	Size of the minority, spatial segregation, ethnic enclaves, group sanctions, ethnic fractionalization	Horn & Konya (2016)	Akerlof & Kranton (2000); Bisin et al. (2011); Bisin & Verdier (2000); Lazear et al. (1999)
Natives	Attitudes towards immigrants, attitudes towards cultural diversity, tolerance, group identity	Berry (2013); Constant et al. (2009); Paas & Halapuu (2012)	Berry (2013, 1989); Kuran & Sandholm (2008)
Policies and institutions	Naturalization, immigration and integration policies, education institutions, legal rights, anti-discrimination laws	Aleksynska (2011); Hainmueller et al. (2017); Wright & Bloemraad (2012)	

Keeping the combination of home and host country characteristics in mind, this literature review is divided into two parts. The first part concentrates on the theoretical underpinnings in both cross-cultural psychology and economics literature explaining the host country factors that may affect the different acculturation patterns of immigrants. And the second part concentrates on the empirical literature. I end the review with own empirical analysis using the data from the European Social Survey. Table 3.1 presents all the possible host country characteristics and the theoretical and empirical literature.

Immigrants

The integration patterns or integration strategies of immigrants could be an individual concept however there are other factors as well that may play a crucial role. I discuss some of those factors that have been researched upon in different disciplines below. One of the most important factor that may affect the integration patterns is the number of immigrants from the same or similar culture residing in the host country or neighbor-

hood. The first simple model capturing the incentives for cultural integration is based on learning the language by the minority or the immigrant groups introduced by Lazear et al. (1999). In this framework, there are two culturally distinct groups with different languages and there is random matching for trading. Knowing a common language improves the possibility of trade between the two individuals. Therefore, due to scale effects it is in the interest of the minority to learn the majority language.

This model lacks the dynamics of cultural transmission over generations. Kónya (2005) extended this model to a dynamic framework where individuals utility is not just dependent on own assimilation gains but also the costs and benefits of the future generations. Out of the theoretical perspectives explained in the previous section, both these models are very close to segmented assimilation where minority learns the foreign language while maintaining other cultural aspects maximizing economic gains. However, first, these models do not explicitly consider other aspects of culture. Secondly, these models have a single dimension where the minority individuals either choose to assimilate completely to the majority group or choose to stay with their own group. The second set of models looks at the cultural transmission by immigrants to the second generation. This strand of literature was introduced by the Bisin & Verdier series of papers where they discuss how the size of the minority may affect the cultural transmission to the next generations. In this setup, parents either choose to transmit the cultural values and norms directly through vertical transmission or through horizontal socialization. They show that large majority groups have an advantage for both vertical and horizontal socialization, which increases the possibility of minority assimilating into majority. We are not aware of theoretical models which involve many groups, or fractionalization based on culture or ethnicity affecting the cultural assimilation strategies and process.

Lazear et al. (1999) uses US data to show how the size of the group affects the assimilation strategies of immigrants. An immigrant is less likely to be fluent in English in communities where there is a high proportion of immigrants from the same country of origin. This also causes immigrants to segregate since there is lower need to adjust if there is higher geographical segregation (Chiswick & Miller 2005). Similarly, Advani & Reich (2015) show that in United States when immigrants make up only a small share of the total population, the proportion of the cohort that speaks English is as high as 90%. However, there is a sharp drop in this mean, to less than 40%, when the immigrant group reaches approximately 1/3 of the population.

This phenomenon is not just valid for learning the host country language but also for other assimilation dimensions. Danzer & Yaman (2013) show that ethnic concentration

increases the cost of interaction with the natives and leads to less contact with the natives, less political participation, as well as less community participation. Researchers also have shown that migrants may choose the location based on the size of their network in a neighborhood. For example, Bauer et al. (2005) show that Mexican migrants with limited English proficiency direct themselves disproportionately to destinations that already contain substantial number of Mexicans, thus providing an environment where they can get by in Spanish, whereas those with English speaking ability are more likely to go to places with small immigrant populations. European immigrants from countries with low divorce rates are especially less likely to be divorced if they reside among a large number of co-ethnics in the United States (Furtado & Trejo 2013).

Another dimension that is correlated with low levels of social integration is spatial segregation. Researchers have shown correlations between spatial segregation that is ethnic enclaves and clustering leading to increases in the size of the community, and low levels of socioeconomic integration (Ehrkamp 2005; Phillips et al. 2007). As a consequence of residential segregation, minority ethnic group members run the risk of living 'parallel lives', not interacting with people from different backgrounds (Bolt et al. 2010). Residents in segregated neighborhoods are, for instance, less likely to find a job or to improve their language proficiency than residents in mixed neighborhoods (Friedrichs et al. 2003; Kearns & Parkinson 2001; Musterd & Ostendorf 2013). In a study of immigrant acculturation patterns in US, Korean immigrants in ethnic enclaves had the highest social support and were also least likely to assimilate, like they could not speak English well (Choi & Thomas 2009). However, spatial segregation also interacts with other factors in affecting the integration of immigrants. For instance, Feldmeyer et al. (2015) show that in highly disadvantaged locales with few socioeconomic resources, segregating immigrants in isolated residential pockets is linked to significantly higher rates of homicide, robbery, and index violence. In contrast, these same spatial arrangements of immigrant segregation from the U.S.-born are linked to lower rates of violence in communities with fewer disadvantages. These studies tend to have problems with causality as immigrants self-select themselves into neighborhoods. Researchers have tried to address this reverse causality issue. Danzer & Yaman (2013) address this by exploiting the random assignment of immigrants to neighborhoods with different network sizes.

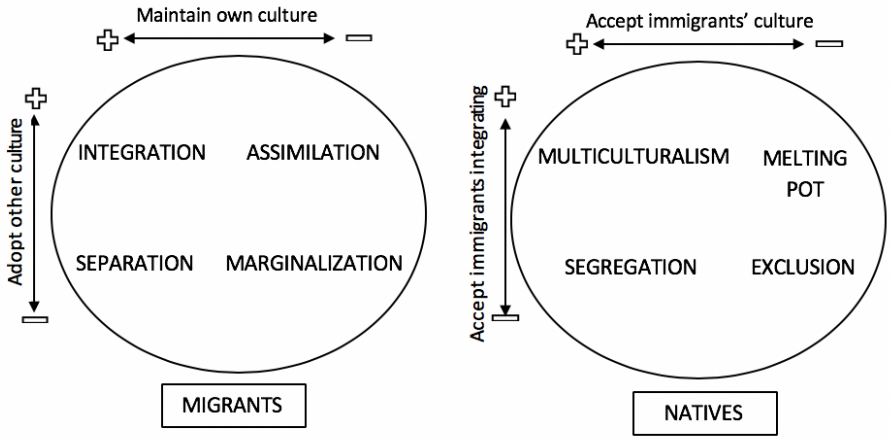
Natives

In the models explained above, it was the immigrants or the minority members who were choosing whether to integrate or not. Their decisions to integrate or not were not affected by what the majority wants or how the natives expect the immigrants to

behave in the host country. The importance of how the natives react to immigrants or how the natives expect the immigrants to behave has been researched in detail in cross-cultural psychology and relatively less in economics. Furthermore, in economics most of the models are one dimensional, immigrants either choose to assimilate or not. There is no middle ground where immigrants may choose to be multicultural where they display cultural behaviors such as language use, choice of friends, media preferences, value systems, that are representative of two or more cultures (LaFromboise et al. 1993; Padilla 2006).

Berry (1997) introduced the fourfold theory of acculturation where an individual chooses the identification levels with both host and home country cultures (see left side of figure 3.2). The integration strategy reflects a desire to maintain key features of the immigrant cultural identity while adopting aspects of the host majority culture. Immigrants who adopt the assimilation strategy essentially relinquish their own cultural identity for the sake of adopting the cultural identity of the host majority. The separation strategy is characterized by maintaining all features of the immigrant cultural identity while rejecting relationships with members of the majority. Finally, marginalization characterizes individuals who reject both their own and the host community culture, thereby losing contact with both their heritage culture and that of the host majority.

Figure 3.2: Individual acculturation strategies



Source: (Berry 1997)

However, for immigrants to successfully apply the acculturation strategies, the native's

attitudes are equally important. The right side of the figure shows the possible dimensions of natives which may affect the success of the acculturation strategies of immigrants. The strategies are the same however the basis or the questions on which the strategies are dependent is different. The multiculturalism strategy implies if the natives accept that the immigrants maintain their own culture however immigrants also learn the host country cultural values and traditions. The melting pot strategy implies that the natives want the immigrants to relinquish their original cultural identity and accept the host country cultural norms. The segregation strategy implies that the natives find it acceptable that the immigrants maintain their own cultural identity however the natives do not want to include the immigrants in the host culture and segregate. The last strategy is exclusion where natives do not want the immigrants to maintain their own cultural practices, neither do they want to include them in the mainstream culture and exclude immigrants from any kind of rights or participation in the host country. This majority minority correspondence leads to a 4 by 4 matrix, and the psychological stress associated with it. Table 3.2 shows the host community and immigrant community acculturation orientations (Bourhis et al. 1997).

Table 3.2: Relational outcomes of host community and immigrant acculturation orientations: The Interactive Acculturation Model (IAM).

	Integration	Assimilation	Separation	Marginalization
Multiculturalism	Consensual	Problematic	Conflictual	Problematic
Melting Pot	Problematic	Consensual	Conflictual	Problematic
Segregation	Conflictual	Conflictual	Conflictual	Conflictual
Exclusion	Conflictual	Conflictual	Conflictual	Problematic

Table 3.2 shows the conceptual framework in cross cultural psychology in which the host and the immigrant community characteristics are combined. As can be seen in the table, if the host community has segregating or excluding attitudes, having a conflictual society is the most likely whatever the immigrants wish to do. Whereas either having a melting pot or a multiculturalist attitudes leads to better outcomes. Therefore, it is very important how natives approach the immigrant community and their culture, and the integration of immigrants is not just dependent on their own preferences. Researchers have shown that the consensual outcomes are the most successful, easy to achieve and lead to low degree of acculturative stress (Zagefka & Brown 2002). Whereas the problematic outcomes lead to a higher degree of stress. Researchers have also shown that multiculturalism and integration are the best strategies and also the most successful for both immigrants and

natives.

Similar models have been introduced in economics as well. One of the first models that considered the role of the majority group affecting the assimilation strategies is the group identity framework introduced by Akerlof & Kranton (2000). Group identity refers to the gains or losses from the social interactions in contrast to Lazear et al. (1999) and Kónya (2005) where the gains or losses are based on the possibilities of trade between different cultural groups. Group identity refers to the utility that individuals derive from belonging to a group and following the actions prescribed by that group. In this framework, individuals may choose to behave according to the majority culture but that also may lead to sanctions or punishments from one's own cultural group. Secondly, individuals may choose to either assimilate or adopt the oppositional identity if they think that the majority is not willing to accept them. For example, the dominant groups may want to exclude other group members because they get utility from differentiation. Therefore, if the minority members want to integrate into the mainstream culture while maintaining their own norms, and the dominant groups want to exclude them as they want to be differentiated from the other group members, this may cause the minority members to adopt oppositional identities. For instance, unemployment could result in loss of self-respect by men who cannot support their families, leading to a rise in crime and drug abuse (Elliott et al. 1996). Immigrants who face social exclusion and discrimination tend to alienate (Bloemraad et al. 2008).

Another model of cultural integration where the cultural hybridization process involves the preference distributions and choices of both the majority as well as the minority was introduced by Kuran & Sandholm (2008). They use an explicitly dynamic theoretical framework on individual choice characterizing the composition of hybrid culture and the speed of cultural change. In the model, the agents belong to two culturally distinct groups and they interact in pairs. Payoffs are dependent on the coordination and personal payoff. The coordination payoff is a strictly decreasing function of the distance between the actions chosen by the two individuals. If the payoffs were dependent only on coordination, it would be a pure coordination game with same action chosen being the Nash equilibrium. However, agents also get payoffs from the identity driven personal ideals, which is also a decreasing function of distance between ideal and chosen action. In the cross-cultural setting, the agents receive different payoffs from within group conformity and across group conformity identified by different parameters in the model. They show how the different parameters for both majority as well as minority lead to different outcomes including the melting pot, segregation, assimilation and multiculturalism parallel to the cross-cultural

psychology. Grout et al. (2015) show how the behavior of the majority group forces the minority to assimilate into the majority culture. That is, when there is a homogeneous group and individuals from different groups enter that society, the environment induces the incumbents to rely less on personal preferences when selecting their actions. Advani & Reich (2015) extend their framework by including a social action and an economic action. They concentrate on the size of the minority, showing that for a small minority it is optimal to assimilate into a majority, that is taking the social as well as economic action according to the majority, whereas for a large minority, cultural diversity persists and may even lead to segregation.

Attitudes towards immigrants have been researched by many researchers showing that negative sentiments of natives towards immigrants are powerfully associated with a cultural threat and perceptions about identity; the differences in cultural values and beliefs is one of the major components explaining differences in attitudes towards immigrants from different countries (Hainmueller & Hiscox 2007).

Immigrants are also likely to be more satisfied in countries that offer more welcoming social settings with positive attitudes of the native-born towards immigrants (Kogan et al. 2018). Using the IZA Expert Opinion Survey of 2007, Constant et al. (2009) find that natives' general negative attitudes towards immigration are a key factor of ethnic minorities facing integration problems. They acknowledge discrimination against immigrants as one of the most important barriers for integration of immigrants. The survey also showed that experts believe that minorities prefer the principle of equal and fair treatment to that of special treatment through specific provisions or positive discrimination.

Institutions

The third form of host country characteristics that may affect the integration patterns of immigrants is institutions and national policies. The policies could be based on education, political participation, access to nationality, anti-discrimination laws, permanent residence etc. To build social cohesion especially with immigrants, it is very important to have inclusiveness in a country's communities and institutions. Authors have argued that dual citizenship offers the best hope of successfully accommodating diversity within liberal democratic states. Government recognition of pluralism and providing support including legal guarantees for equal access, anti-discrimination laws, multicultural curricula, right to practice religious beliefs, affirmative public support in the form of assistance to immigrant communities that wish to set up community organizations; and reasonable accommodations in public institutions, such as the right to wear religious

apparel (Bloemraad 2007). Countries differ in their integration policies dramatically. For instance, France emphasizes strong assimilationist principles based on the Republican model; Canada bases its policies on multiculturalism; and Germany describes itself as the ethnocultural conception of nationhood. In terms of country characteristics, settler societies like USA, Canada, and Australia also seem to have better levels of integration as compared to nation states like European countries where immigration started after a long time (Alba & Foner 2014). Some European countries, like the UK and the Netherlands, strive to promote minority ethnic inclusion whilst maintaining social diversity (Phillips & Harrison 2010). In countries like Denmark and Germany, however, integration is equated with (cultural) assimilation (Bolt et al. 2010).

However, there are different perspectives on how these policies may affect the integration patterns of immigrants. The first perspective is when the costs of maintaining diversity is reduced, for instance possibilities to set up ethnic media, mother tongue teaching programs, and religious schools (van Tubergen & Kalmijn 2005) (van Tubergen & Kalmijn, 2005). This may lead to higher integration because immigrants may get stimulated to participate in the host society (Bloemraad 2006; Parekh 2001). This may also lead to less integration by immigrants because of less incentives to learn host country culture since the origin culture can be practiced easily (Barry 2002). Other aspects of could be thought of as the integration policy where if individuals feel welcomed, by having laws against discrimination or ease of access to citizenship, this may lead to better integration patterns which is also line with the Integrative Acculturation Model (IAM) (Bourhis et al. 1997; Padilla & Perez 2003). If there is less equality between immigrants and natives in terms of legal rights, citizenship or voting rights for instance, it may lead to immigrants not integrating into the mainstream culture and maintaining their home culture as a source of self-esteem, that is marginalizing themselves (Verkuyten & Brug 2002).

One of the policies that has been researched in the literature is naturalization making immigrants legally identical to natives in terms of legal status, rights, political and other forms of participation, and a sense of belonging (Bloemraad et al. 2008). Citizenship can be described as ethnic or civic citizenship. For example, Germany followed a notion of ethnic citizenship where having your ancestors from Germany automatically made one eligible for a German citizenship even if you have lived in another country through-out your life. However, they did not give citizenship to immigrants' children who were born in Germany and have never lived in any other country. This ethnic conception of citizenship leads to less participation by the immigrants in the way of life of natives. Rather than contributing to a homogeneous cultural core, it excludes and alienates the immigrants. In

United States, working in the country for 5 years and knowing basic reading and written English makes you eligible for the citizenship.

However, studies have mixed results on the effects of naturalization on integration of immigrants. In US, having citizenship is correlated with higher wages for immigrants, especially for immigrants from less developed countries (Bratsberg et al. 2002). Hainmueller et al. (2015) study the effects of naturalization on the political participation of immigrants. They show that naturalization considerably improved immigrants' political integration, including increases in formal political participation, political knowledge, and political efficacy. However, there is also literature contradicting these theories showing that equality-promoting and inclusionary integration policies do not contribute to the same levels of trust for immigrants and natives (Dinesen & Hooghe 2010).

Several studies focusing on the effects of naturalization on integration patterns also address the self-selection of immigrants into naturalization. There are several ways to disentangle the causal effect of policies like naturalization from the non-random self-selection. There are some studies which have exploited certain policies to address the self-selection problem. Hainmueller et al. (2017) exploit the quasi-random assignment of citizenship in Swiss municipalities that used referendums to decide on naturalization applications of immigrants. They found that receiving citizenship strongly improved the long-term social integration of immigrants especially for marginalized immigrant groups. They also argue that the integration returns are larger when naturalization occurs at an early stage in the residency period of immigrants. Overall, they argue for policy paradigm that naturalization is a catalyst for improving the social integration of immigrants rather than merely the crown on the completed integration process. Gathmann et al. (2016) address the problem of self-selection into citizenship by exploiting the exogenous variation in citizenship rules in Germany from 1991 to 2000. They find that the option to naturalize delays marriage to later ages and reduces the likelihood of marrying someone from the country of origin. Female immigrants also have lower fertility overall and tend to postpone their first birth, especially when they are high-skilled. Similarly, Avitabile et al. (2014) exploit the change in policy of birth right citizenship in Germany. They find that birthright citizenship leads to a reduction in immigrant fertility and an improvement in health and socio-emotional outcomes for the children affected by the reform. They reason this result due to the "quantity-quality" model introduced by Becker.

In the next section I use European Social Survey to test if the integration patterns of the immigrants differ in destinations with different cultures and if the attitudes towards diversity by the native population may explain this differential integration patterns by

immigrants.

3.2 Data description

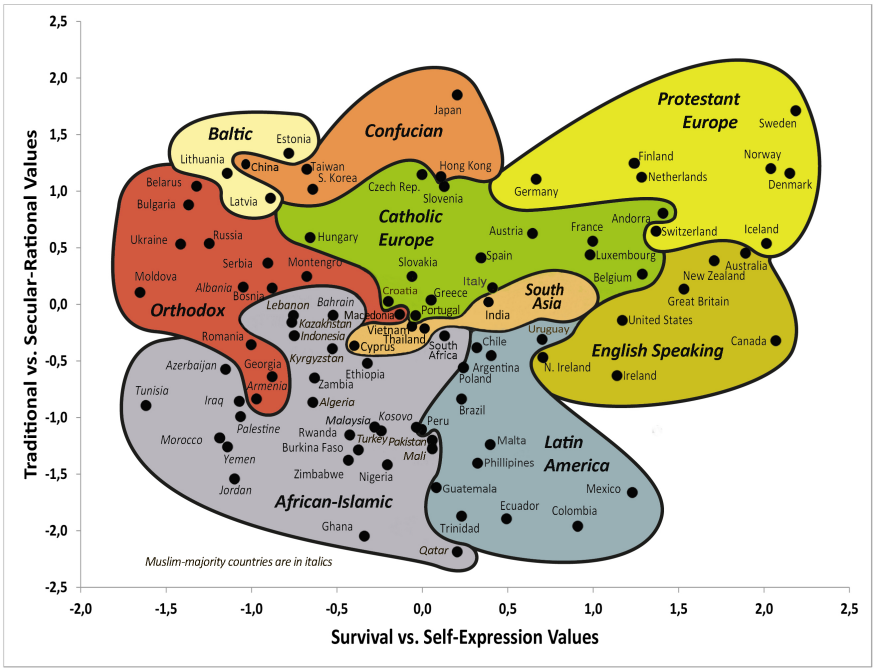
This study uses the European Social Survey (ESS) to analyze the integration patterns of immigrants. The ESS is a cross-sectional multistage survey carried out with probability samples of individuals which is representative of persons aged 15 and older regardless of their nationality, citizenship and language. The ESS source questionnaire is designed in British English and translated by each national team with specific guidelines following the TRAPD methodology (Translation, Review, Adjudication, Pretesting and Documentation). The survey measures the attitudes, beliefs and behavior patterns of diverse populations to contribute substantially to the development of social indicators. The broad coverage provides substantial heterogeneity taking several countries into consideration in terms of social, economic and political contexts. the ESS takes place in different European countries since 2002 and it takes place once every two years. I use all eight rounds of ESS starting from 2002 to 2018. The countries covered in ESS are shown in the appendix.

For this analysis, an individual is considered as a native if, she and her parents were both born in the country where they live and where they were surveyed. Doing this, I make sure that the I only include those individuals who have grown up in the host country culture for at least 2 generations. For an individual to be considered as in immigrant, I include both 1st generation and 2nd generation immigrants. That is, all the individuals who were either not born in the country or whose parents were not born in the country. Individuals who have one of the parents a native or born in the same country where they were being surveyed are exclude form the analyses.

This study uses the cultural proximity map introduced by Inglehart (2006) from the World Value Survey. In the cultural map the countries are divided into eight clusters based on their cultural proximity and not geographical proximity as shown in Figure 3.3. The eight clusters are: African Islamic, Baltic, Confucian, Orthodox, Catholic Europe, English speaking, Latin American, Protestant Europe and South Asia. The countries are divided based on two dimensions which explain more than 70 percent of the cross-national variance of different indicators which are also correlated with other indicators. The first dimension is the traditional vs. secular/rational dimension where the importance of religion, traditions, family ties is taken into consideration. The second dimension is the survival vs self-expression value system, where the economic survival and subjective

well-being are compared between countries. I further test if the host characteristics are correlated with integration patterns of immigrants between 2002 and 2018.

Figure 3.3: The cultural map



Source: Inglehart (2006)

The outcome indicators used in these analyses are limited to those questions from the ESS that fit the traditional vs secular/rational or survival vs self-expression value system in the cultural map. Each question is considered as a separate dependent variable. Table 3.2 shows the list of measures that are used in the analysis for the immigrants and the main measure for the natives that may explain the differential acculturation patterns of the immigrants. These questions are also the commonly used measures of acculturation strategies of immigrants.

Table 3.3: Cultural indicators

Variable name	**Question**	**Coded as**
Dependent variables for immigrant acculturation patterns		
Praying frequency*	Apart from when you are at religious services, how often, if at all, do you pray?	On a scale from 1 to 7: 1 every day; 2 more than once a week; 3 once a week; 4 at least once a month; 5 only on special holy days; 6 less often; 7 never
Religiosity	Regardless of whether you belong to a particular religion, how religious would you say you are?	On a scale form 0 - 10: 0 not religious at all; 10 very religious
Traditional*	Tradition is important to her/him. She/he tries to follow the customs handed down by her/his religion or her/his family. How much is this person like you?	On a scale from 1 to 6: 1 very much like me; 2 like me; 3 somewhat like me; 4 a little like me; 5 not like me; 6 not like me at all
Traditional value index	Index based on factor analysis using praying frequency, religiosity and traditional variables	Ranges from -2 to 2 where a low value means low on traditional values such as praying frequency, religiosity and being traditional
Civic participation	Have you worn or displayed a campaign badge/sticker?	1 Yes; 0 No
	Have you worked in a political party or action group?	1 Yes; 0 No
	Have you signed a petition?	1 Yes; 0 No
	Have you taken part in a lawful public demonstration?	1 Yes; 0 No
	Have you boycotted certain products?	1 Yes; 0 No

Trust levels	Would you say that most people can be trusted, or that you can't be too careful in dealing with people?	On a scale form 0 - 10: 0 you can,Äôt be too careful; 10 most people can be trusted
Pro homosexuality*	Using this card, please say to what extent you agree or disagree with each of the following statements. Gay men and lesbians should be free to live their own life as they wish	On a scale from 1 to 5: 1 agree strongly; 2 agree; 3 neither agree nor disagree; 4 disagree; 5 disagree strongly
Survival value index	Index based on factor analysis using civic participation, trust levels and pro homosexuality variables	Ranges from -2 to 2 where a low value means low on survival values such as civic participation, trust levels and less in favor of homosexuality
The native independent variable		
Pro diversity	Would you say that country's cultural life is generally undermined or enriched by people coming to live here from other countries?	On a scale form 0 - 10: 0 cultural life undermined; 10 cultural life enriched
Pro-immigration	To what extent do you think [country] should allow many/few immigrants from poorer countries outside Europe	On a scale form 1 - 4: 1 Allow many; 2 Allow some; 3 Allow few; 4 Allow none

Note: The first column shows the variable names that have been used in the analyses.

The variables with a star have been reversed for ease of analyses.

The first column shows the variable name which would also be used later in the analysis. The second column shows the question that is asked in the ESS and the third column shows the measurement index. The first six questions show the measures for the acculturation patterns of immigrants. The two questions under the subheading natives is the

attitudes of natives towards cultural diversity and immigration which is the possible measure explaining the differential acculturation patterns of immigrants. Although this is not completely in accordance with the strategies used in cross-cultural psychology explained in the previous section, it explains if the natives want the immigrants to assimilate, that is if the natives are against the cultural diversity (value 0) and if the natives want the immigrants to integrate, that is the natives are pro diversity (value 10). The second native variable is attitudes of natives towards immigration from poor countries outside Europe. The variables praying frequency, traditional and pro homosexuality have been reversed so that the variables mean higher praying frequency, more traditional, and more in favor of homosexuality. Furthermore, all the variables have been re-scaled so that they are in the interval 0 to 1. That is, all the responses have been divided by the maximum possible value of the variable to make the variables comparable. Following the cultural map I also create two cultural indexes for the traditional values based on the factor analysis of the three variables "Praying frequency, religiosity, and traditional" and for the survival values based on the factor analysis of the other three variables "civic participation, trust levels and pro homosexuality". The two cultural indexes are based on the variables which are similar to the variables used in the cultural map used in the analysis.

The sample is limited to the cultural clusters where there is a high number of immigrants for statistical power and there is also native information available. These are protestant Europe, catholic Europe, orthodox and English speaking. However, the immigrants come from all eight cultural origin clusters. The countries that are included in these cultural clusters are shown in the appendix. The ESS also collects the standard socio-demographic characteristics including age, gender, education, employment status, household income etc. which are included as covariates. Table 3.2 shows the summary statistics for immigrants from different cultural origins in catholic European, English speaking, orthodox and protestant European destination clusters respectively. For some cultural clusters there is no data available for immigrants in some the destination cultural clusters. That is there is no data available for immigrants from Confucian, English speaking and south Asian cluster in orthodox destination cluster.

Table 3.2 also shows the native averages in the cultural destinations. The responses for the natives are in line with the cultural map, where the protestant European natives have the lowest levels of praying frequency, are the least religious, the least traditional and have the lowest level of traditional values index. Whereas the English speaking, orthodox and catholic Europe are all high on religiosity and traditional with orthodox a little low on the praying frequency. The opposite results hold for the survival values,

where protestant Europe has the highest levels of civic participation, trust levels and are more in favor of homosexuality than the other destinations. And the orthodox have the lowest value of survival index whereas the other destinations are in between the two.

Table 3.2 shows the responses of all the immigrants from different origins in the four destination cultural clusters. The first row of these immigrant tables shows the average of all the immigrants from a particular cultural cluster origin irrespective of the destination. The tables also show the averages of immigrants in each of the four cultural destinations separately, and a t-test is also performed to see if these means are significantly different from the natives of that cultural destination from the top four rows of Table 3.2 which show the native means. The Islamic immigrants tend to have higher levels of traditional values, that is high praying frequency, high religiosity, they are more traditional and also the traditional values index is higher than any of the native destination clusters, however these practices differ across the destinations. The immigrants tend to be much lower on the traditional value index in the orthodox cultural destinations, whereas in other destinations the Islamic immigrants tend to have higher levels of traditional values. All the means are significantly different from the natives apart from the orthodox destinations where the averages of these variables are much closer to the orthodox natives. Whereas in terms of survival index the Islamic immigrants have different levels compared to the protestant European and the English-speaking natives but similar levels compared to the orthodox and the catholic Europe which are both lower than the others. This shows that the immigrants adapt to the host country characteristics differently in different cultural destinations.

Table 3.4: Summary statistics

	Pray freq.	Religiosity	Traditional	Traditional values index	Civic part.	Trust levels	Pro homosex.	Survival values index	Obs.
				Natives in					
Catholic Europe	0.39	0.47	0.66	−0.01	0.29	0.44	0.69	−0.08	91573
English speaking	0.50	0.47	0.66	0.07	0.39	0.53	0.77	0.14	28649
Orthodox	0.37	0.47	0.69	−0.03	0.15	0.44	0.45	−0.39	41647
Protestant Europe	0.30	0.43	0.61	−0.20	0.52	0.61	0.79	0.31	89248
				Islamic immigrants in					
Total	0.60	0.64	0.74	0.49	0.34	0.48	0.61	−0.10	4362
Catholic Europe	0.65^{a}	0.71^{a}	0.77^{a}	0.66^{a}	0.33^{a}	0.45	0.58^{a}	−0.15	1556
English speaking	0.78^{a}	0.67^{a}	0.77^{c}	0.74^{a}	0.33	0.50	0.57^{a}	-0.12^{a}	558
Orthodox	0.39^{a}	0.51^{a}	0.75	0.09^{a}	0.12^{a}	0.43^{a}	0.43^{a}	-0.44^{b}	210
Protestant Europe	0.54^{a}	0.58^{a}	0.71^{a}	0.33^{a}	0.37^{a}	0.50^{a}	0.65^{a}	-0.02^{a}	2038
				Catholic European immigrants in					
Total	0.40	0.50	0.66	0.05	0.37	0.48	0.75	0.05	3894
Catholic Europe	0.37^{c}	0.49^{a}	0.68^{c}	−0.01	0.32^{a}	0.44	0.72^{a}	-0.03^{a}	2067
English speaking	0.42^{b}	0.39^{a}	0.59^{a}	-0.15^{a}	0.35	0.53	0.80^{a}	0.15^{a}	198
Orthodox	0.52^{a}	0.68^{a}	0.84	0.46^{a}	0.29^{a}	0.31^{a}	0.46^{a}	-0.41^{b}	38
Protestant Europe	0.45^{a}	0.53^{a}	0.64	0.12^{a}	0.42^{b}	0.53^{a}	0.77	0.15^{a}	1591
				Confucian immigrants in					
Total	0.27	0.40	0.65	−0.26	0.27	0.62	0.74	0.14	218
Catholic Europe	0.24^{b}	0.36^{a}	0.66^{c}	−0.40	0.15^{b}	0.58	0.70^{a}	-0.03^{a}	47
English speaking	0.27^{b}	0.37^{b}	0.65^{a}	-0.30^{a}	0.23	0.60	0.75^{a}	0.10^{a}	64
Protestant Europe	0.28	0.44^{c}	0.65^{a}	−0.17	0.34	0.66^{b}	0.75^{a}	0.23^{a}	107
				English speaking immigrants in					
Total	0.42	0.44	0.59	−0.07	0.45	0.57	0.81	0.25	1077
Catholic Europe	0.33^{c}	0.41^{b}	0.59	−0.21	0.40^{a}	0.59	0.82^{a}	0.25^{a}	108
English speaking	0.47^{c}	0.44^{c}	0.60^{a}	-0.01^{c}	0.41	0.54	0.81^{a}	0.20^{a}	680
Protestant Europe	0.33^{c}	0.44	0.58^{a}	−0.15	0.54^{b}	0.64^{b}	0.82^{a}	0.37^{a}	289
				Latin American immigrants in					
Total	0.56	0.54	0.68	0.28	0.28	0.51	0.75	0.03	2125
Catholic Europe	0.61^{a}	0.57^{a}	0.66	0.36^{a}	0.25	0.48^{c}	0.78^{a}	0.01^{a}	691
English speaking	0.58	0.53	0.72	0.28	0.12^{a}	0.52	0.73	-0.07^{a}	568
Orthodox	0.67^{a}	0.63^{a}	0.74^{c}	0.49^{a}	0.10^{a}	0.44^{a}	0.31^{a}	-0.54^{b}	39
Protestant Europe	0.51^{a}	0.53^{a}	0.68	0.20^{a}	0.42	0.53^{a}	0.75	0.13	827
				Orthodox immigrants in					
Total	0.42	0.52	0.70	0.11	0.17	0.49	0.50	−0.28	7498
Catholic Europe	0.52^{a}	0.60^{a}	0.76^{a}	0.35^{a}	0.16^{a}	0.44	0.58^{a}	-0.28^{a}	1865
English speaking	0.50	0.50	0.66^{a}	0.14	0.17^{c}	0.53	0.69	−0.06	243
Orthodox	0.39^{a}	0.49^{a}	0.68^{c}	0.03^{a}	0.11^{a}	0.49^{a}	0.39^{a}	-0.42^{b}	4000
Protestant Europe	0.38^{a}	0.50^{a}	0.65	0.01^{a}	0.33^{a}	0.54^{a}	0.67^{a}	0.02^{a}	1390
				Protestant European immigrants in					
Total	0.32	0.42	0.59	−0.20	0.51	0.60	0.82	0.32	2232
Catholic Europe	0.33^{a}	0.45^{b}	0.62	−0.12	0.40^{a}	0.53^{b}	0.80^{a}	0.18^{a}	408
English speaking	0.36^{b}	0.39^{a}	0.58^{a}	-0.22^{a}	0.40	0.60^{c}	0.83^{a}	0.27^{a}	127
Orthodox	0.30^{a}	0.50^{a}	0.81^{c}	0.04^{a}	0.23^{a}	0.60^{a}	0.57^{a}	-0.09^{b}	26
Protestant Europe	0.32	0.41^{c}	0.58^{a}	−0.22	0.55^{c}	0.62^{c}	0.82^{a}	0.37^{a}	1671
				South Asian immigrants in					
Total	0.61	0.62	0.70	0.44	0.30	0.55	0.69	0.03	651
Catholic Europe	0.55	0.66^{a}	0.71^{c}	0.47	0.26^{b}	0.51	0.62^{a}	-0.10^{a}	85

continued . . .

	Pray freq.	Religiosity	Traditional	Traditional values index	Civic part.	Trust levels	Pro homosex.	Survival values index	Obs.
English speaking	0.70^{a}	0.63^{a}	0.71^{c}	0.55^{a}	0.29	0.54	0.66	-0.01	344
Protestant Europe	0.50^{a}	0.58	0.68^{b}	0.25	0.33	0.58	0.75^{a}	0.14^{a}	222

Source: own calculation based on the ESS. T-test for differences in means between the immigrants and natives in each cultural destination is performed.
^{c} $p < 0.1$, ^{b} $p < 0.05$, ^{a} $p < 0.01$

Similar results hold for catholic European immigrants. They tend to have similar levels of traditional values index, that is the praying frequency, religiosity and belief in following traditions in English speaking, protestant European and catholic European destinations but higher levels in orthodox destinations. Whereas comparing these means to the natives of the respective destinations, they are not so different from the natives of the English speaking, catholic European and protestant European but have much higher traditional values compared to the orthodox destination natives. In terms of survival values, the immigrants tend to have similar levels of civic participation in Catholic European, English speaking and Orthodox destinations ranging from 0.29 to 0.35 but have much higher levels of civic participation in protestant European destinations. The trust levels also show similar patterns apart from the English speaking where the trust levels are as high as the protestant European destinations at 0.53. They have the least favoritism towards homosexuality in orthodox destinations and are more in favor of homosexuality in other destinations. The survival index is high in English speaking and protestant European and low in catholic European and orthodox destinations. Comparing these to the natives of the respective destinations, although it shows statistically different, the absolute value of the survival index of catholic European immigrants is similar to the natives in all destinations.

The Confucian and the English-speaking immigrants do not differ across the cultural destinations in terms of their traditional values or the survival values. The averages are quite similar irrespective of the destination although they differ compared to the natives since the natives differ. This shows that the Confucian and English-speaking immigrants do not adjust differently in different destinations or their adaptation levels do not depend on the country of destinations.

The Latin American immigrants tend to have similar traditional values in Catholic European, English speaking and protestant European destinations but have very high traditional values in orthodox destinations. Similar results hold for the survival index and the variables associated with the survival index. The Latin American immigrants tend to have similar survival values in all destinations apart from the orthodox where they have

much lower survival index. This shows that the Latin American immigrants integrate differently in orthodox destinations but similarly in other destinations.

The orthodox immigrants also do not differ in their integration patterns across destinations apart from the catholic European destinations in terms of their traditional values. The mean values are similar across destinations on all the variables associated with the traditional value index apart from the catholic European destinations where the mean values are much higher. Whereas for the survival values index and the variables associated with it, the immigrants tend to have similar values English speaking and catholic destinations but different in orthodox destinations and protestant European destinations. They have much lower values of civic participation, lower trust levels and are less in favor of homosexuality in orthodox destinations but they also have much higher levels of civic participation in protestant European destinations including a high survival index. All these values also differ significantly from the natives only in protestant European and orthodox destination but not in the other two destinations.

The protestant European immigrants also tend to differ only in orthodox destination but have similar traditional values in all other destinations. Similar results hold for survival values which shows that immigrants tend to adjust more in orthodox destinations but have similar cultural practices in all other destinations. We have data for south Asian immigrants only in English speaking and protestant European destinations. The south Asian immigrants tend to have higher traditional values in English speaking destinations and lower in protestant European destinations which is also in line with the natives of these destinations, which shows that the immigrants tend to adjust to the native cultural practices. Similar results hold for survival index where the immigrants tend to have higher levels of civic participation, higher levels of trust and are more in favor of homosexuality in protestant European destinations and it is the opposite in the English-speaking destinations.

Although these are only average values, they do show that there are still significant differences between immigrants' integration patterns base destination cultural practices and immigrants tend to adjust the most in orthodox destinations and adjust less but maintain their cultural practices in protestant European destinations. The next section focuses on more in-depth analysis of these patterns.

3.3 Empirical analysis

3.3.1 Cultural differences

The point of departure is to check if the cultural clusters significantly differ based on the dependent variables used in the analysis. For this purpose, I use the following specification:

$$(Outcome)_{\text{iot}} = a + \beta_1(English\,speaking) + \beta_2(Orthodox) + \beta_3(Protestant\,Europe) + X_i + \gamma_o + \delta_t + e_{iot}\,for\,i \in N \tag{3.1}$$

where $(Outcome)_{iot}$ is the response of individual i to the questions in Table 3.2. Eq. (3.1) is estimated for all the native-born N only with a focus on the coefficients $\beta_1, \beta_2 \& \beta_3$ which shows the differences between the cultural clusters for all dependent variables from Table 3.2. The reference category is the Catholic European cluster. Each regression controls for individual specific parameters, X_i including, age, gender, education and employment status, γ_o is the origin country fixed effect, and δ_t is the survey round fixed effect. The standard errors are clustered at the origin country and the survey round interaction where the individuals give their response.

Table 3.5: Native born differences

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.116***	-0.0724***	-0.0389***	-0.0198	0.0388**	0.129***	0.268***	0.410***
	(0.0144)	(0.00936)	(0.0119)	(0.0284)	(0.0194)	(0.0125)	(0.0183)	(0.0310)
Orthodox	-0.0279***	0.146***	0.0528***	0.212***	0.0247*	-0.0924***	-0.133***	-0.215***
	(0.00725)	(0.00479)	(0.00970)	(0.0137)	(0.0145)	(0.00753)	(0.0190)	(0.0297)
Protestant Europe	-0.376***	-0.286***	-0.161***	-0.886***	0.370***	0.213***	0.321***	0.739***
	(0.00645)	(0.00680)	(0.00903)	(0.0139)	(0.0162)	(0.00820)	(0.0182)	(0.0284)
Observations	254493	256774	250410	244807	258932	258057	248238	247601
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.269	0.202	0.117	0.276	0.168	0.174	0.292	0.355
P-value for T-tests								
$\beta_1 - \beta_2$	0.000	0.000	0.000	0.000	0.383	0.000	0.000	0.000
$\beta_1 - \beta_3$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$\beta_2 - \beta_3$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.5 shows the estimates from Eq. 3.1 where the catholic European natives are the reference category. Since all the variables have been scaled down to range from 0-1 apart from the indexes which range from -2 to 2, the estimates in all the regressions show the differences in percentage of the respective independent variable. That is, if the coefficient is 0.40 for praying frequency in English speaking clusters, it means that the average response of praying frequency in English speaking clusters is $0.4 * 7 = 2.8\, units$ on the 7-point scale higher than the reference category. The table also shows a t test if the difference between the coefficients of English speaking, orthodox and protestant European natives is significantly different than zero. The natives differ significantly in these cultural clusters. The natives from the English-speaking countries pray the most out of the four clusters and the protestant European pray the least. However, the orthodox are the most religious as well as the most traditional and the protestant European are the least religious and traditional. The protestant European have the lowest levels of traditional values index and the orthodox have the highest. Whereas for the survival values variables, it is the protestant European who have the highest levels of civic participation, the trust levels as well as are more in favor of homosexuality than other clusters. And orthodox cluster countries have the least survival values on all the variables apart from the civic participation where the Catholic European countries have less civic participation than all other clusters. The survival values index (column 8) also shows that the orthodox countries have the lowest level of survival values and the protestant European have the highest values, and English-speaking cluster countries have relatively higher survival values than the catholic European.

This shows that the groups of countries that fall in different cultural clusters are different from each other based on traditional and survival values and are in line with the cultural map. The next subsection focuses on the integration patterns of immigrants from different cultural origins to the four cultural destination clusters.

3.3.2 Integration patterns

This section focuses on the integration patterns of immigrants from six different cultural clusters: Islamic, catholic Europe, Confucian, English speaking, Latin America, orthodox, protestant Europe, and south Asia in the four destination clusters: catholic Europe,

English speaking, orthodox and protestant Europe. I adopt the following specification:

$$(Outcome)_{\text{iot}} = a + \beta_1(English\,speaking) + \beta_2(Orthodox) \\ +\beta_3(Protestant\,Europe) + X_i + \gamma_o + \delta_t + e_{iot}\,for\,i \in M \tag{3.2}$$

where $(Outcome)_{idt}$ is the response of individual i to the questions in Table 3.2. Eq. (3.1) is estimated for all the native born N only with a focus on the coefficient $\beta_1, \beta_2, \&\beta_3$, which shows how much do the cultural practices of immigrants differ in different destinations where the reference category is always Catholic Europe. Each regression controls for individual specific parameters, X_i including, age, gender, education and employment status, γ_o is the origin country fixed effect, and δ_t is the survey round fixed effect. The standard errors are clustered at the origin country and the survey round level where the individuals give their response. I discuss one by one the immigrants from a cultural origin.

Islamic immigrants

Table 3.6 shows the results for Eq. 3.1 for the Islamic immigrants. The Islamic immigrants tend to have different levels of traditional values as well as survival values across destinations. They tend to have the least praying frequency in the orthodox destinations (14.7% less than the catholic Europe), whereas the most in catholic Europe and English-speaking destinations which are not significantly different from each other. They also pray 5% less in protestant Europe as compared to catholic Europe. The levels of religiosity are 5% to 8% lower in all destinations compared to catholic Europe but similar in all other destinations. They also believe it is less important to follow traditions in protestant European destinations but by only 3% and have the same levels of beliefs in all other destinations. Overall, the traditional values index shows that the Islamic immigrants have the lowest traditional values index in orthodox destinations by 0.22 compared to the catholic Europe, whereas in protestant European destinations their traditional values index is 0.19 lower than the catholic Europe. The traditional values index in English speaking is similar to the catholic European destination clusters.

The survival values variables also show different patterns. The survival values for the Islamic immigrants are highest in protestant European destinations where the natives also have higher survival values as shown in Table 3.6 where as they are the lowest in orthodox destinations. The catholic European and the English speaking have similar levels of survival values variables including civic participation, trust levels and attitudes towards homosexuality. This can be seen in column 4-8 where all the coefficients are

insignificant for English speaking and are significantly lower for orthodox and the lowest for the protestant European destinations.

Table 3.6: Islamic immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.0443	-0.0545**	-0.00877	-0.0391	0.0315	-0.00778	0.00876	0.0139
	(0.0328)	(0.0229)	(0.0198)	(0.0651)	(0.0369)	(0.0193)	(0.0266)	(0.0392)
Orthodox	-0.147***	-0.0599**	0.0192	-0.225**	-0.0932**	0.000813	-0.104***	-0.165***
	(0.0471)	(0.0271)	(0.0361)	(0.0950)	(0.0403)	(0.0178)	(0.0393)	(0.0536)
Protestant europe	-0.0506**	-0.0857***	-0.0347***	-0.197***	0.0620**	0.0432***	0.0651***	0.141***
	(0.0206)	(0.0144)	(0.0112)	(0.0406)	(0.0264)	(0.0109)	(0.0214)	(0.0335)
Observations	4329	4340	4184	4138	4364	4352	4153	4147
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.131	0.148	0.072	0.161	0.076	0.048	0.095	0.132
P-value for T-tests								
$\beta_1 - \beta_2$	0.000	0.865	0.481	0.070	0.013	0.705	0.005	0.002
$\beta_1 - \beta_3$	0.001	0.138	0.164	0.006	0.399	0.004	0.009	0.000
$\beta_2 - \beta_3$	0.022	0.296	0.112	0.746	0.000	0.006	0.000	0.000

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Catholic European immigrants

Table 3.7 shows the estimates from Eq. 3.2 for the catholic European immigrants. The integration patterns for catholic European immigrants also differ across destinations. The praying frequency for catholic European immigrants is higher in all the cultural destinations compared to catholic European destinations. All the coefficients in column 1 are positive and significant. However, it is not different across English speaking, orthodox and protestant European destinations as the p-values for t-tests comparing the coefficients are all high, so the null of them being equal cannot be rejected. The catholic European immigrants tend to have 5.1% higher levels of religiosity in protestant European destinations but similar levels in all other destinations. The beliefs in importance of traditions is the same for catholic European immigrants across all the destinations. Combining these three variables, the traditional values index is higher for catholic European immigrants in protestant European countries but similar across all other destinations. That is, the catholic European immigrants tend to integrate differently only in protestant European destinations but similarly in orthodox, English speaking and catholic European destinations.

Table 3.7: Catholic europe immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.159***	-0.0322	-0.0224	0.0674	-0.0871**	0.0591***	-0.0123	0.00454
	(0.0280)	(0.0238)	(0.0173)	(0.0690)	(0.0362)	(0.0207)	(0.0164)	(0.0377)
Orthodox	0.154*	0.101	0.0981*	0.335	0.0267	-0.0947**	-0.235***	-0.289***
	(0.0833)	(0.0820)	(0.0548)	(0.218)	(0.0665)	(0.0400)	(0.0582)	(0.0712)
Protestant europe	0.121***	0.0512***	-0.0106	0.192***	0.0554**	0.0741***	0.0118	0.118***
	(0.0180)	(0.0155)	(0.0112)	(0.0409)	(0.0223)	(0.00952)	(0.0104)	(0.0205)
Observations	3845	3856	3570	3511	3887	3873	3802	3788
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.136	0.101	0.053	0.133	0.086	0.078	0.137	0.195
P-value for T-tests								
$\beta_1 - \beta_2$	0.955	0.106	0.041	0.232	0.143	0.001	0.000	0.001
$\beta_1 - \beta_3$	0.174	0.001	0.559	0.079	0.000	0.498	0.183	0.006
$\beta_2 - \beta_3$	0.690	0.538	0.055	0.509	0.677	0.000	0.000	0.000

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

The survival values show a little different integration patterns as compared to the traditional values patterns. The catholic European immigrants tend to integrate into the protestant European survival values as the civic participation and the trust levels are higher for catholic European immigrants, although the attitudes towards homosexuality are similar in protestant European destinations as compared to catholic European destinations. This is also shown in the survival values index (column 8) where the survival values index is significantly higher in protestant European destinations compared to the catholic European destinations. However, in orthodox destinations, the survival values of the catholic European immigrants are lower than in the catholic European as the index is lower which is mostly due to the lower trust levels (column 6) and significantly less in favor of homosexuality (column 7). This is also in line with the native attitudes where the orthodox natives have lower survival values compared to all other destinations and protestant European natives have higher traditional values as shown in Table 3.5.

Confucian immigrants

Although there are very few observations for Confucian immigrants in the data and there is no data available for orthodox destination cluster, the Confucian immigrants also tend to have higher traditional values and also survival values in protestant European countries but similar traditional and survival values in catholic European and English-

speaking countries. Although the different levels of traditional values index come only from a high level of religiosity in protestant European destinations, the higher values of survival index come from higher levels of trust and the rest of the cultural practices are similar for Confucian immigrants across all the destinations.

Table 3.8: Confucian immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.0892	0.0777	0.0160	0.250	-0.0102	0.0176	0.0161	0.0241
	(0.0812)	(0.0730)	(0.0725)	(0.172)	(0.0807)	(0.0498)	(0.0544)	(0.0852)
Protestant europe	0.0566	0.155**	0.0306	0.381**	0.0750	0.0802**	0.0189	0.155*
	(0.0939)	(0.0621)	(0.0646)	(0.163)	(0.0880)	(0.0320)	(0.0364)	(0.0837)
Observations	215	214	205	200	218	217	207	206
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.012	0.082	0.110	0.082	0.063	-0.000	0.078	0.133
P-value for T-tests								
$\beta_1 - \beta_3$	0.620	0.203	0.729	0.412	0.379	0.112	0.946	0.219

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

English speaking

There is no data available for English speaking immigrants in orthodox destinations and the estimates for other destinations from Eq. 3.2 are shown in Table 3.9. The English-speaking immigrants only tend to have higher praying frequency in English speaking destinations but have similar traditional values in all other destinations. As far as the survival values are concerned, the civic participation and the trust levels are higher in protestant European destinations compared to other destinations which also cause the survival values index to be higher in protestant European cluster. But the attitudes towards homosexuality are similar across the destinations.

Table 3.9: English speaking immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.135**	0.0300	-0.0111	0.185	0.0193	-0.0306	-0.0134	-0.0335
	(0.0519)	(0.0344)	(0.0366)	(0.121)	(0.0688)	(0.0230)	(0.0223)	(0.0590)
Protestant europe	0.0205	0.0465	-0.00740	0.0921	0.138**	0.0396**	-0.00656	0.110*
	(0.0425)	(0.0289)	(0.0467)	(0.0988)	(0.0556)	(0.0181)	(0.0245)	(0.0565)
Observations	1072	1065	1036	1021	1079	1075	1070	1067
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.144	0.099	0.066	0.142	0.051	0.063	0.076	0.106
P-value for T-tests								
$\beta_1 - \beta_3$	0.005	0.607	0.878	0.299	0.016	0.000	0.567	0.001

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Latin American immigrants

The estimates for Latin American immigrants are shown in Table 3.10. The Latin American immigrants tend to pray more in English speaking and orthodox destinations than catholic Europe and protestant European destinations. And the religiosity is also high in orthodox but similar in other three destinations. The traditional values are similar in all three destinations. Although the Latin American immigrants tend not to integrate differently on the traditional value index but for the survival values, they tend to have the highest survival values index in protestant European destinations and the lowest in orthodox destinations. The high levels of survival index are due to high levels of civic participation and trust levels but the attitudes towards homosexuality are similar in protestant European and catholic European destinations. For the English speaking and orthodox destinations, the civic participation is lower, and individuals are less in favor of homosexuality compared to catholic Europe, but the trust levels are higher in English speaking destinations.

Table 3.10: Latin America immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.0779***	-0.0140	0.0267	0.0408	-0.138***	0.0333**	-0.0442**	-0.0934***
	(0.0278)	(0.0204)	(0.0204)	(0.0524)	(0.0313)	(0.0151)	(0.0181)	(0.0222)
Orthodox	0.146*	0.0902**	0.0217	0.218	-0.141***	-0.0186	-0.382***	-0.458***
	(0.0736)	(0.0417)	(0.0459)	(0.150)	(0.0514)	(0.0580)	(0.0535)	(0.102)
Protestant europe	-0.0247	-0.0102	-0.00814	-0.0601	0.140***	0.0552***	-0.0217	0.118***
	(0.0225)	(0.0181)	(0.0158)	(0.0454)	(0.0321)	(0.0142)	(0.0191)	(0.0367)
Observations	2107	2115	2045	2025	2124	2118	2064	2058
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.122	0.089	0.043	0.111	0.137	0.050	0.085	0.141
P-value for T-tests								
$\beta_1 - \beta_2$	0.382	0.018	0.890	0.287	0.954	0.378	0.000	0.000
$\beta_1 - \beta_3$	0.000	0.818	0.040	0.031	0.000	0.064	0.287	0.000
$\beta_2 - \beta_3$	0.026	0.014	0.499	0.078	0.000	0.192	0.000	0.000

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Orthodox immigrants

Similar results hold for orthodox immigrants shown in Table 3.11 where they tend to integrate, and the traditional values index is low in the protestant European but also in other orthodox destinations compared to English speaking and catholic European destinations. The praying frequency, religiosity and beliefs in importance of traditions all are lower in orthodox and protestant destinations. The survival index is significantly higher in protestant European destinations but lower in orthodox and similar in English speaking and catholic European destinations. This shows that the orthodox immigrants also tend to integrate according to the host country values in protestant specially in European destinations.

Protestant European immigrants

The protestant European immigrants have higher levels of traditional values in orthodox destinations where the natives also have higher traditional values. Although most of this increase in the traditional values comes from believing in importance of traditions but not for religiosity or praying frequency. Similar results hold for the survival values index where the immigrants tend to have lower survival values by having lower levels of civic participation and are also less in favor of homosexuality in orthodox destinations, although the trust levels are similar in orthodox, catholic and English-speaking

destinations.

Table 3.11: Orthodox immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.0239	-0.0492*	-0.0472**	-0.0734	-0.0693**	0.0218	0.0468*	0.0304
	(0.0326)	(0.0267)	(0.0226)	(0.0725)	(0.0274)	(0.0178)	(0.0258)	(0.0371)
Orthodox	-0.136***	-0.0777***	-0.0647***	-0.276***	-0.0571***	-0.0143	-0.121***	-0.155***
	(0.0303)	(0.0214)	(0.0156)	(0.0644)	(0.0197)	(0.0142)	(0.0171)	(0.0257)
Protestant europe	-0.0831***	-0.0644***	-0.0746***	-0.211***	0.133***	0.0729***	0.0791***	0.233***
	(0.0294)	(0.0183)	(0.0122)	(0.0575)	(0.0145)	(0.0136)	(0.0168)	(0.0254)
Observations	7373	7451	7366	7134	7550	7508	6936	6914
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.114	0.073	0.044	0.113	0.070	0.041	0.171	0.164
P-value for T-tests								
$\beta_1 - \beta_2$	0.000	0.291	0.410	0.002	0.660	0.038	0.000	0.000
$\beta_1 - \beta_3$	0.000	0.565	0.238	0.049	0.000	0.002	0.239	0.000
$\beta_2 - \beta_3$	0.019	0.434	0.530	0.209	0.000	0.000	0.000	0.000

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.12: Protestant europe immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.0195	-0.0534**	-0.0311	-0.0934	-0.0612	0.0603**	0.0161	0.0425
	(0.0372)	(0.0265)	(0.0324)	(0.0758)	(0.0457)	(0.0237)	(0.0183)	(0.0434)
Orthodox	0.0407	0.120	0.242***	0.368*	-0.354***	0.0429	-0.265***	-0.416***
	(0.0829)	(0.0753)	(0.0527)	(0.186)	(0.0779)	(0.0495)	(0.0712)	(0.0982)
Protestant europe	0.00603	-0.00362	-0.0244	-0.0257	0.0521*	0.0832***	0.0126	0.130***
	(0.0175)	(0.0171)	(0.0274)	(0.0551)	(0.0275)	(0.0168)	(0.0115)	(0.0291)
Observations	2222	2230	2116	2088	2245	2243	2227	2225
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.106	0.081	0.038	0.112	0.081	0.081	0.112	0.157
P-value for T-tests								
$\beta_1 - \beta_2$	0.815	0.040	0.000	0.028	0.001	0.689	0.000	0.000
$\beta_1 - \beta_3$	0.755	0.036	0.813	0.379	0.013	0.240	0.803	0.031
$\beta_2 - \beta_3$	0.673	0.092	0.000	0.026	0.000	0.416	0.000	0.000

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

South Asian immigrants

The data for South Asian immigrants is also not available in orthodox countries but in protestant European destinations, the South Asian immigrants tend to have lower levels of traditional values and higher levels of survival values compared to English speaking and catholic Europe. They tend to pray less, be less religious as well as less traditional in protestant Europe, but the only increase in the survival values comes from being more in favor of homosexuality but the other values tend to be similar in all destination clusters.

Table 3.13: South asia immigrants

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
English speaking	0.0656	-0.0415	0.0140	-0.00125	-0.00871	-0.00768	0.0419	0.0322
	(0.0547)	(0.0358)	(0.0351)	(0.122)	(0.0503)	(0.0256)	(0.0424)	(0.0530)
Protestant europe	-0.0115	-0.114***	-0.0300	-0.200*	0.0818	0.0402	0.111**	0.199***
	(0.0560)	(0.0332)	(0.0449)	(0.100)	(0.0520)	(0.0251)	(0.0424)	(0.0641)
Observations	642	639	611	600	648	641	623	619
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
R squared	0.115	0.067	0.004	0.074	0.038	0.028	0.117	0.108
P-value for T-tests								
$\beta_1 - \beta_3$	0.109	0.102	0.137	0.098	0.030	0.008	0.059	0.000

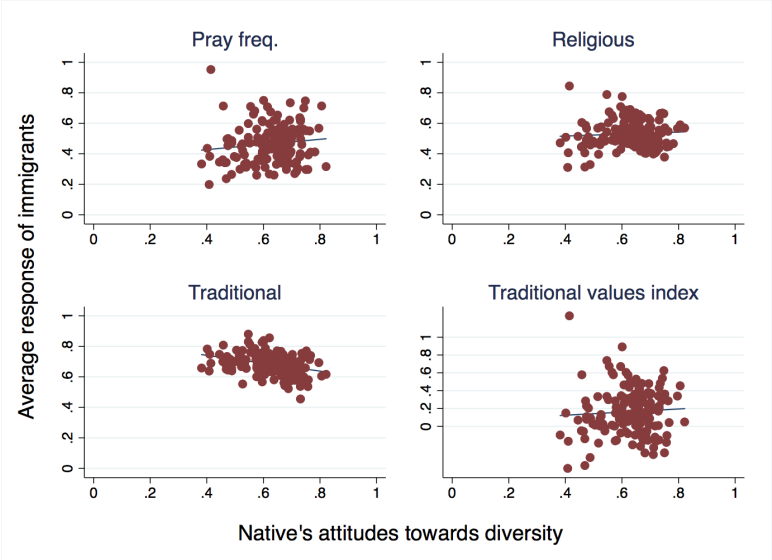
Standard errors in parentheses
Robust standard errors in parentheses clustered at the country of origin and the survey round level.
Each regression includes the full set of country of origin and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

All the tables above for immigrant integration show that the integration levels for immigrants differ based on the host country and they also differ based on traditional and survival values. In most of the cases, the immigrants tend to have a higher traditional value score in orthodox destinations and a lower traditional value score in protestant European destinations. Whereas the survival values tend to be higher in protestant Europe and lower in orthodox which is in line with the native scores as shown in Table 3.5. Although the integration patterns differ also for the practices consisted in the traditional values index and the survival values index. In some cases, the immigrants tend to increase their religiosity in protestant Europe, for example the Confucian immigrants whereas in case of orthodox destinations the immigrants tend to have similar cultural as the natives. What are the factors that affect this differential pattern? Studies have shown that the institutions and the immigration policies play a crucial role, as well the size of the cultural group. However, I concentrate on the native's attitudes towards diversity and immigration which may affect this differential pattern as shown in the next section.

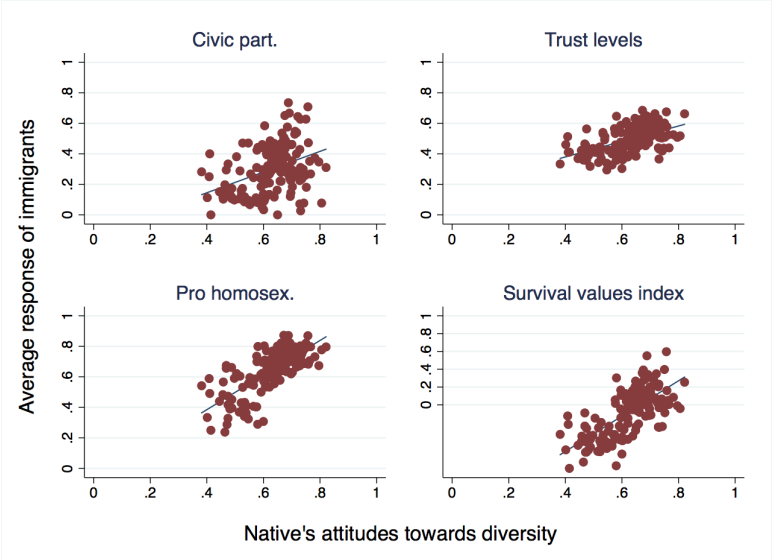
3.3.3 Do natives' attitudes towards diversity matter?

The previous analysis shows that the adaptation patterns of immigrants differ across cultural destinations and are also different for immigrants from different cultural origins. Immigrants tend to adapt in most countries, but the adaptation levels differ. Some immigrants assimilate completely into the host country characteristics, but some adapt only partially maintaining their origin country characteristics or attitudes even in the destination countries. In some cases, immigrants tend to segregate by not adapting to the host country cultural practices. What explains these differential patterns? Earlier literature has shown that host country institutions are relevant for the integration patterns of immigrants (Maxwell 2010; Ersanilli & Koopmans 2011) but to the best of my knowledge there is no empirical work which shows that the natives' attitudes towards diversity and immigration may also affect these integration patterns. Although there are case studies in cross-cultural psychology which show that the natives' attitudes towards diversity, and how welcoming the natives are towards the immigrants can play a crucial role in the integration patterns of immigrants. Using the ESS data I analyze if the native's attitudes may affect the integration patterns.

Figure 3.4a and Figure 3.4b show the correlation between the average attitudes of natives towards diversity, that is if they think that the cultural life is enriched by people coming to live here from other countries, and the average traditional and survival values of immigrants from different countries of origin. The upper panel shows the traditional values and all the traditional practices, and the lower panel shows the survival values. The traditional values seem to be less correlated with the native's attitudes towards immigrants apart from the importance of following traditions which shows a negative correlation. That is when the natives are more in favor of diversity, the immigrants tend to be given lower importance to traditions. This also drives the traditional values index to be negatively correlated with the native's attitudes towards diversity. The survival values seem to be positively correlated with the native's attitudes towards diversity. That is, as the natives attitudes become more positive towards cultural life getting enriched by immigrants, the immigrants in those countries tend to participate more in civic activities, have higher levels of trust and become more in favor of homosexuality. This is also shown in the survival values index in the lower panel. Similar results hold for natives attitudes towards immigration shown in Figure 3.5a and Figure 3.5b, where the more the natives are in favor of immigrants coming from poor countries outside Europe, the more the immigrants tend to participate in civic activities, have higher trust levels and are more in favor of homosexuality, that is a higher survival index.



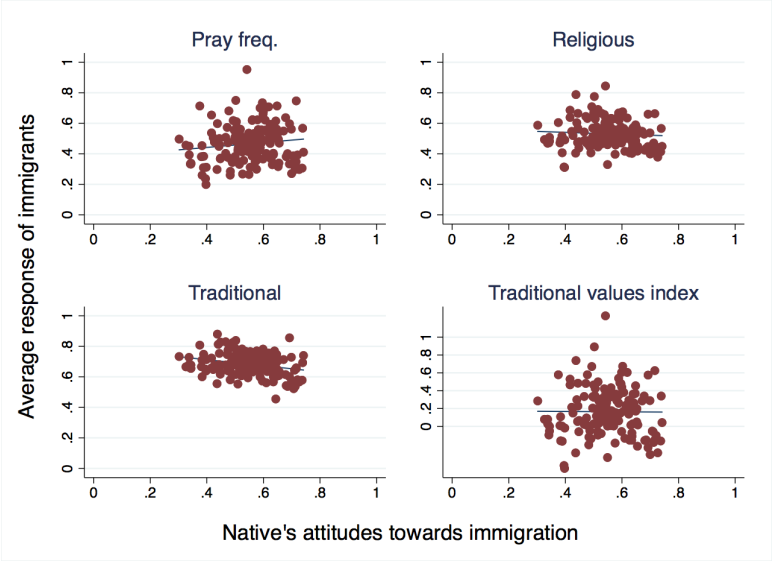
(a) Traditional values



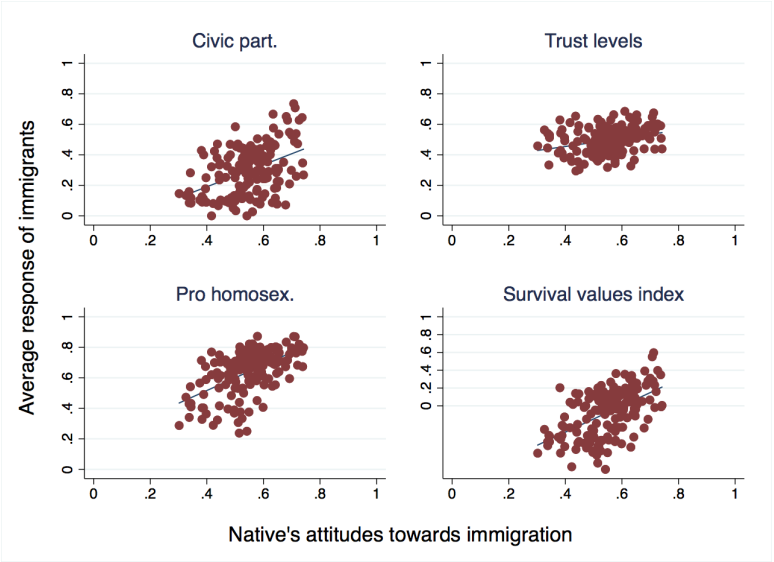
(b) Survival values

Figure 3.4: Correlations between native's attitudes towards diversity and cultural values

Notes: Own calculation based on the ESS. The figure fits the average response of immigrants for all the variable in Table 3.2 to the average native attitudes towards pro diversity. The average responses are calculated at the country of destination, country of origin and the ESS round level.



(a) Traditional values



(b) Survival values

Figure 3.5: Correlations between native's attitudes towards immigration and cultural values

Notes: Own calculation based on the ESS. The figure fits the average response of immigrants for all the variable in Table 3.2 to the average native attitudes towards pro diversity. The average responses are calculated at the country of destination, country of origin and the ESS round level.

Table 3.14 and Table 3.15 shows the estimates from linear regressions confirming the results above. I adopt the following specification:

$$\begin{aligned}(Outcome)_{\text{idt}} = \beta_1(Native's\, attitudes) \\ +X_i + \alpha_d + +\delta_t + e_{idt}\, for \imath \in M\end{aligned} \tag{3.3}$$

Eq. 3.3 is estimated for all the migrants, M in all the destinations. The coefficient of interest is β_1 which captures if the native's attitudes towards pro diversity or the native's attitudes towards immigration affect the integration patterns of immigrants. The regressions control for country of destination and the ESS round fixed effects. The standard errors are clustered at the country of destination and survey round fixed effects. The results from Table 3.14 show that the traditional values are not affected by the native's attitudes towards diversity, but the civic participation and the trust levels increase by 43% and 18% respectively. This also causes the survival values index to increase by as much as 0.57 units for the immigrants and it is significant at 5% level. Table 3.15 shows similar results when the independent variable of interest is attitudes towards immigration. The attitudes towards immigration show similar results for the survival values where the civic participation increases by 57% and the immigrants are 25.5% more in favor of homosexuality in countries where the natives support immigration. This also shows an effect on the traditional values, where the immigrants tend to be more religious in countries which are more in favor of immigration by 20%, and the traditional values index is higher by 0.542. Both the coefficients are highly significant. This shows that immigrants tend to maintain their home country cultural practices or tend to be more traditional when the attitudes towards immigration are positive. Although this analysis has a limitation of causality which I cannot address due to the data limitation, it does show that the attitudes towards diversity and the attitudes immigration are correlated with the cultural practices of immigrants.

Table 3.14: Effects of average attitudes towards diversity

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
Pro diversity	-0.00429	0.142	0.0177	0.244	0.435**	0.180*	0.160	0.576**
	(0.981)	(0.254)	(0.875)	(0.482)	(0.018)	(0.050)	(0.343)	(0.023)
Observations	21805	21910	21133	20717	22115	22027	21082	21024

p-values in parentheses
Robust standard errors in parentheses clustered at the country-survey round level.
Each regression includes the full set of country of residence and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.15: Effects of average attitudes towards immigration from poor countries outside Europe

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
Pro immigration	0.167	0.201***	0.0319	0.542**	0.509***	0.0957	0.255**	0.638***
	(0.106)	(0.009)	(0.670)	(0.017)	(0.000)	(0.121)	(0.032)	(0.000)
Observations	21805	21910	21133	20717	22115	22027	21082	21024

p-values in parentheses
Robust standard errors in parentheses clustered at the country-survey round level.
Each regression includes the full set of country of residence and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3.3.4 Additional analysis

The previous sections focused on the levels of cultural practices of immigrants in different destinations, however it did not show by how much immigrants differ compared to their home country counterparts. That is if immigrants tend to differ from the natives of their home country and their host country. Do immigrants tend to adjust towards the host country cultural practices but what is the level of this adaptation? How close do they get to the host country and how distant are they from their home country practices? For this purpose, I analyze the integration patterns of immigrants in different cultural destinations separately for the immigrants from each of the cultural origins with a special focus on the differences in the practices of natives and how immigrants adapt to these differences from a specific cultural origin. I limit this analysis only to protestant European, catholic European and English-speaking immigrants as these are the destinations where I have information available for both the host country and the home country population. The following empirical specification is adopted:

$$(Outcome)_{\text{iodt}} = \beta_1(Cultural\,destination_{native}) + \beta_2(Cultural\,destination_{immigrant}) + X_i + \alpha_o + \gamma_d + \delta_t + e_{iodt}\; for\; i \in M_O, N \tag{3.4}$$

where $(Outcome)_{iodt}$ is the response of individual i to the questions in Table 3.2. Eq. (3.2) is estimated for the sample of all native born, N and the immigrants from a specific cultural origin O, where $M_O \in \{Catholic\,Europe,\ English\,speaking,,\ Protestant\,Europe\}$ with a focus on the coefficient β_1 capturing the differences in cultural practices between the natives of different cultural clusters and β_2 capturing the differences in cultural prac-

tices of the immigrants from a specific cultural origin. I consider the integration patterns of immigrants in Baltic, catholic European, orthodox, English speaking and protestant European cultural destinations compared to the natives of the cultural origin. That is, I conduct these regressions separately for all the cultural origins for which there is data available for natives and immigrants of the cultural origin. The reference/omitted category in the regression is always the natives of the cultural origin cluster O for which the regression is conducted. Each regression controls for individual specific parameters, X_i including, age, gender, education and employment status, α_o is the origin country fixed effect of the immigrant, γ_d is the destination country fixed effect, and δ_t is the survey round fixed effect. The standard errors are clustered at the destination country level where the individuals give their response.

The main interest of this analysis is to compare if the immigrants adjust in the direction of the initial differences between the natives or in the opposite direction or do not change their cultural practices. This is done by comparing the coefficient β_1 of & β_2 for that cultural destination. However, this would not show the degree of adaptation of the immigrants towards the native practices. For this purpose, I show the post estimation test at the bottom of the tables which shows the difference between the native and immigrant estimates for the respective destination cultural clusters.

Catholic Europe

Table 3.16 shows the estimates from Eq. 3.2 capturing the differences between the natives of different cultural clusters and the integration patterns of immigrants from Catholic European origins in different cultural destinations. Catholic European natives are used as the reference category. The dependent variable is shown at the top of the column. As also shown before the cultural practices are significantly different in different cultural clusters. The protestant European are the lowest on the traditional values and highest on the survival values. Whereas English speaking are the highest on the traditional values and lower on survival values than catholic European. However, the main coefficients of interest in this table is to compare the immigrant and native coefficients for the two destinations. This would show the integration patterns of immigrants. An opposite sign of the coefficients mean that the immigrants become farther away from the natives of the cultural destination in terms of their cultural practices. However, a same sign would mean that the immigrants become closer to the cultural practices of the natives of the destination. The t test at the bottom of the table shows that if the immigrants have become similar to the natives or if the immigrants still maintain their old cultural practices but have become closer to the native population cultural practices.

The estimates show that the catholic European immigrants tend to integrate differently in different domains and with different magnitudes. The praying frequency is 13.5% higher than the natives of their home country counterparts when the English-speaking natives praying frequency is 40% higher. Whereas in protestant European cluster the praying frequency of natives is 8% lower than the catholic European natives whereas the immigrants' praying frequency is 15% lower than their home country native counterparts. Both these differences are highly significant as can be seen in the t-tests at the bottom of the table. In terms of religiosity, the immigrant's levels of religiosity are 8% lower in English speaking cluster when the natives in English speaking cluster have 9% higher levels of religiosity than the catholic cluster natives. However, in protestant European cluster the immigrants' levels of religiosity is 14% lower and the natives' levels of religiosity is 12% lower than the catholic European natives. But this difference is insignificant as shown in the t-tests. The immigrants tend to be 4% less traditional than their native home country counterparts when the natives in the host countries are 3% more traditional in the English-speaking cluster. In the protestant European cluster, the immigrants are 16% less traditional and the natives are also 8% less traditional.

The traditional values index of these three variables is shown in column 4 of Table 3.16. As expected, the catholic European natives tend to adapt more to the protestant European cultural practices, as the traditional values index of immigrants is 0.4 units lower in protestant European countries when the natives have a traditional values index 0.20 points lower than the catholic European natives. Whereas in English speaking cluster the traditional values index is 1.01 units higher for the natives and only 0.26 units higher for the immigrants compared to the catholic European natives. This shows that the catholic European immigrants tend to assimilate more in the protestant European cluster but assimilate less or maybe integrate but maintain their home country practices. Columns 5-8 of Table 3.16 concentrates on the survival index of the catholic European immigrants. The immigrants tend to have 10% lower levels of civic participation whereas the natives have only 1% in English speaking countries. In protestant European countries the civic participation rate for immigrants is 17% higher and for natives it is 29% higher than the catholic European natives. These differences are also significant as can be seen in the t-tests below. The trust levels are higher in English speaking cluster by 7% for immigrants and by 3% for natives, whereas in protestant European cluster the trust levels are similar for natives and immigrants which are higher than the catholic European natives by almost 12%. The attitudes towards homosexuality are lower in English speaking countries by 4% and 2% for natives and immigrants respectively although the difference between the two is insignificant. In protestant European cluster, the trust levels for both immigrants

and natives are higher by almost 2%.

The survival values index of these three variables is shown in column 8 and it shows that in English speaking cluster, the immigrants do not change their survival values although these two countries are quite similar on this index. However, in protestant European cluster, the survival values of immigrants adjust according to the native levels which is 0.30 units higher although not completely. For immigrants the survival values index increases by 0.24 units which is different than the native index coefficient at 5% significance.

English speaking

Table 3.17 shows the estimates when the immigrants are from English speaking cluster with English speaking natives as the reference category. The English-speaking immigrants tend to adapt to host country characteristics in both Catholic European and protestant European cluster. The praying frequency for English speaking immigrants decreases by 2.5 points when the natives also have a 2.45 points lower praying frequency than the English-speaking natives. The civic participation for immigrants is higher in both protestant European and English-speaking cluster although significantly lower in protestant European cluster. The religiosity decreases to match the natives' levels in both English speaking and protestant European cluster. Similar results hold for attitudes towards homosexuality where immigrants become more in favor of homosexuality and are not significantly different from the natives. The immigrants become less traditional in both Catholic European and protestant European cluster. The trust levels also seem to match the native levels where the trust levels of the immigrants increase in protestant European and decrease in catholic European cluster matching the native trust levels. The life satisfaction of the immigrants is higher in both the clusters as well matching the native levels of life satisfaction. The coefficients are not significantly different from each other as shown in the post estimation tests.

Table 3.16: Catholic Europe

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Immigrant	-0.0561***	-0.0265**	-0.0182*	-0.108**	0.0326*	-0.0134*	0.0254**	0.0303*
	(0.0164)	(0.0124)	(0.00985)	(0.0387)	(0.0175)	(0.00647)	(0.00962)	(0.0161)
English speaking	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Native	0.409***	0.0907***	0.0361***	0.558***	-0.0360***	0.0338***	-0.0396***	-0.0224***
	(0.00193)	(0.00135)	(0.000934)	(0.00449)	(0.00162)	(0.000715)	(0.00137)	(0.00220)
Immigrant	0.127***	-0.0872***	-0.0772***	-0.0749	-0.100***	0.0625***	-0.0275**	-0.0105
	(0.0206)	(0.0174)	(0.0120)	(0.0513)	(0.0198)	(0.00854)	(0.0128)	(0.0178)
Protestant Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Native	-0.0835***	-0.123***	-0.0852***	-0.307***	0.296***	0.118***	0.0145***	0.309***
	(0.00112)	(0.000761)	(0.000567)	(0.00224)	(0.00104)	(0.000572)	(0.000786)	(0.00147)
Immigrant	-0.142***	-0.150***	-0.186***	-0.486***	0.180***	0.116***	0.0201	0.247***
	(0.0196)	(0.0144)	(0.0137)	(0.0456)	(0.0348)	(0.0113)	(0.0136)	(0.0286)
Observations	215533	216330	209901	206749	217826	217283	212775	212351
Catholic European natives	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Test for zero difference between native and immigrant estimates								
English speaking	0.000	0.000	0.000	0.000	0.004	0.004	0.380	0.529
Protestant Europe	0.009	0.076	0.000	0.001	0.003	0.860	0.692	0.041

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country level.
Each regression includes the full set of country of origin and residence fixed effects, and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.17: English speaking

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Native	-0.461***	-0.376***	0.0530	-0.961***	0.343***	-0.315***	-0.198***	-0.317***
	(0.0661)	(0.0485)	(0.0504)	(0.144)	(0.0983)	(0.0190)	(0.0251)	(0.0876)
Immigrant	-0.158***	-0.0213	0.0769***	-0.141***	0.0310**	-0.0651***	0.0262**	-0.0281*
	(0.0205)	(0.0125)	(0.00806)	(0.0396)	(0.0143)	(0.00796)	(0.0109)	(0.0135)
English speaking	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Immigrant	0.0210***	0.00263	-0.0329***	0.0133	0.00795	-0.00607*	0.0259***	0.0222***
	(0.00514)	(0.00474)	(0.00387)	(0.0125)	(0.00779)	(0.00293)	(0.00401)	(0.00625)
Protestant Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Native	-0.221***	-0.0991**	-0.107**	-0.391***	0.393***	0.0335	0.00803	0.269***
	(0.0426)	(0.0416)	(0.0397)	(0.108)	(0.0867)	(0.0209)	(0.0143)	(0.0670)
Immigrant	-0.144***	-0.0621***	-0.0973***	-0.273***	0.264***	0.0444***	0.0634***	0.258***
	(0.0137)	(0.00777)	(0.00801)	(0.0245)	(0.0109)	(0.00524)	(0.0101)	(0.0157)
Observations	212795	213576	207403	204291	215056	214523	210074	209661
English speaking natives	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Test for zero difference between native and immigrant estimates								
Catholic Europe	0.000	0.000	0.623	0.000	0.008	0.000	0.000	0.006
Protestant Europe	0.103	0.367	0.822	0.285	0.163	0.552	0.008	0.880

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country level.
Each regression includes the full set of country of origin and residence fixed effects, and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 3.18: Protestant Europe

	(1) Pray freq.	(2) Religious	(3) Traditional	(4) Traditional values index	(5) Civic part.	(6) Trust levels	(7) Pro homosex.	(8) Survival values index
Catholic Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Native	0.0826***	0.122***	0.0849***	0.306***	-0.297***	-0.118***	-0.0141***	-0.309***
	(0.000906)	(0.000639)	(0.000529)	(0.00163)	(0.00140)	(0.000637)	(0.000570)	(0.00131)
Immigrant	0.0978***	0.181***	0.144***	0.444***	-0.258***	-0.0681***	0.0281	-0.195***
	(0.0151)	(0.0163)	(0.0153)	(0.0368)	(0.0220)	(0.0150)	(0.0200)	(0.0229)
English speaking	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Native	0.493***	0.214***	0.121***	0.865***	-0.333***	-0.0841***	-0.0540***	-0.332***
	(0.00178)	(0.00148)	(0.00108)	(0.00458)	(0.00182)	(0.000842)	(0.00144)	(0.00281)
Immigrant	0.0859***	0.0216*	0.114***	0.159***	-0.397***	-0.0211	0.0272	-0.228***
	(0.0156)	(0.0107)	(0.0151)	(0.0307)	(0.0179)	(0.0129)	(0.0190)	(0.0252)
Protestant Europe	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Immigrant	-0.0183	-0.0108	-0.0199**	-0.0433*	-0.0231	0.0147*	0.0218***	0.0220
	(0.0131)	(0.00869)	(0.00799)	(0.0246)	(0.0153)	(0.00721)	(0.00740)	(0.0132)
Observations	213920	214716	208457	205334	216196	215665	211205	210793
Protestant Europe natives	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Test for zero difference between native and immigrant estimates								
Catholic Europe	0.334	0.002	0.001	0.001	0.097	0.004	0.047	0.000
English speaking	0.000	0.000	0.644	0.000	0.002	0.000	0.000	0.000

Standard errors in parentheses
Robust standard errors in parentheses clustered at the country level.
Each regression includes the full set of country of origin and residence fixed effects, and survey round effects.
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Protestant Europe

Table 3.18 shows the effects for the protestant European immigrants in Catholic European and English-speaking clusters. The protestant European immigrants tend to adapt to the destination cluster attitudes in all domains although with different magnitudes. All the estimates are positive and significant for praying frequency (see column 1, Table 3.18) although immigrants tend to adapt significantly lower in English speaking cluster. The English-speaking natives pray 2.95 points more than the protestant European natives, but the immigrants pray only 1.46 points more than their origin country native country parts and the difference between these two coefficients is significantly different than zero. The civic participation of protestant European immigrants decreases in all other destinations where the natives also have lower levels of civic participation (see column 2, Table 3.18). Similar results hold for religiosity where the immigrants adapt to the higher levels of religiosity in the host countries although significantly lower in English speaking countries (see column 3, Table 3.18). Immigrants do not adjust their attitudes towards homosexuality in Catholic Europe but become less favorable towards homosexuality in English speaking cluster (see column 4, Table 3.18). Immigrants also tend to become more traditional in both clusters also the effect is significantly lower than the native of English-speaking cluster. The immigrants are only 0.21 points more traditional than their origin country native counterparts whereas the English-speaking natives are 0.6 points more traditional than the protestant European natives. Immigrants also have lower levels of trust although still significantly higher than the English-speaking natives and lower levels of life satisfaction in both destination clusters similar to the natives of the destinations.

3.4 Concluding remarks

This literature review focused on what are the factors that affect the integration patterns of immigrants. I focused on three different categories which may affect t these patterns. The first strand of literature focuses on the immigrant perspective which includes factors such as, the size of the group in the population, the spatial segregation, possibility of ethnic enclaves, the strength of group identity or the degree of group sanctions, the ethnic fractionalization, the length of stay of the immigrant in the destination country. All these factors significantly affect the integration patterns of immigrants. Researchers have shown theoretically as well as empirically the effects of these factors on the integration patterns of immigrants. These factors are researched upon in detail in the economics and

cross-cultural psychology discipline.

The second strand of literature focuses on the native perspective which includes factors such as native's attitudes towards immigrants, native's attitudes towards cultural diversity, tolerance, or group identity. Researchers from different disciplines have researched empirically how these factors affect the integration patterns especially in cross cultural psychology, however there is not enough research in applying those theories from cross cultural psychology in economic models to better understand the integration of immigrants. Using the European Social Survey data I show that the immigrants show differential integration patterns in different cultural clusters using the cultural map. Based on the eight cultural clusters, I find that native's attitudes towards cultural diversity and immigration affects both the traditional values and survival values. More specifically, I find that the levels of religiosity is higher, the probability to participate in civic activities is higher and immigrants become more in favor of homosexuality as the natives become more in favor of immigration and diversity. This shows a positive link in terms of integration, that the immigrants tend to integrate by maintaining their cultural practices as well as converging towards the native's cultural practices and attitudes.

The third strand of literature focuses on policies and institutions such as naturalization, integration policies, education institutions, legal rights and anti-discrimination laws. Although there is enough empirical research in this regard, there is a lot of scope for more theoretical research on the effects of these institutions on the integration patterns to quantify these effects for policy implications.

Appendix

Table 3.19: Countries in cultural map

African Islamic	Baltic	**Catholic Europe**	Confucian	**English speaking**	Latin America	Orthodox	**Protestant Europe**	South Asia
Ghana, Mali, Nigeria, Rwanda, Uganda, South Africa, Tanzania, Algeria, Bangladesh, Egypt, Ethiopia, Indonesia, Iran (Islamic Republic of), Jordan, Morocco, Pakistan, Turkey, Zambia, Zimbabwe, Iraq, Azerbaijan, Bahrain, Kazakhstan, Kyrgyzstan, Lebanon, Qatar, Tunisia, Palestine, Yemen, Kosovo	Estonia, Latvia, Lithuania	**Belgium, Croatia, Czech Republic, France, Italy, Luxembourg, Slovakia, Slovenia, Spain, Greece, Portugal**, Andorra	China, Japan, S. Korea, Hong Kong, Taiwan	**Ireland, United Kingdom**, Australia, Canada, New Zealand, United States of America	Argentina, Brazil, Chile, Colombia, El Salvador, Guatemala, Mexico, Peru, Uruguay, Venezuela, Puerto Rico, Poland, Philippines, Trinidad	Belarus, Bulgaria, Moldova, Romania, Russia, Ukraine, Serbia, Macedonia, Albania, Armenia, Georgia, Montenegro, Bosnia	**Denmark, Finland, Iceland, Netherlands, Norway, Sweden, Switzerland, Germany**	Cyprus, India, Malaysia, Viet Nam, Thailand

Notes: The countries in bold are used in the analysis for which there is data available in ESS

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