4
Culture and Collective Action

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4.1 Introduction

Are there cultural underpinnings for differences in types of collective action? One may think that countries that have been successful in establishing democracies earlier than other countries had stronger historical traditions of collective action. If this were true, countries that have not yet established democracies are simply lagging in having their population stage a successful revolution to establish democracy. Looking back in human history, things seem, however, quite different from such a simple scheme. Some countries may have had a stronger tradition of collective action than established democracies, but the aims of that collective action may not necessarily have been to establish democracy. In a recent paper, Gorodnichenko and Roland (2013) presented a model and empirical evidence showing that countries with individualist culture would adopt democracy earlier than countries with collectivist culture, *even* if the latter possibly had better traditions of collective action. In this chapter, we would like to take a closer look at this question and look for micro-foundations of different types of collective action in different cultures. We focus on the comparison between individualism and collectivism, so it is useful in such an endeavor to compare Chinese and European history, which are relatively well documented.

If we compare Chinese history with European history, since the times of the Qin and Han dynasty and the Roman Empire, two stylized facts emerge:

First, peasant and popular revolts played very little role in Europe in leadership change compared to China. In the Roman Empire, it was never the case that an Emperor was overthrown by a popular revolt. All such changes happened inside narrow elite circles (Sainte Croix, 1981; see also Finer, 1997). In contrast, in China, there are several well known cases of peasant revolts leading to the Emperor being overthrown or even a change in dynasty. The Han dynasty was founded by Liu Bang who was at the head of an army that started as a rebellion of peasant soldiers. Later, around the end of Western Han, the Green Forest

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rebellion brought an end to the Xin dynasty founded by Wang Mang, and one of the Green Forest leaders, Liu Xiu, founded the Eastern Han Dynasty. The Yellow Turban rebellion played a big role in the collapse of the Eastern Han dynasty as its suppression led to the Three Kingdom periods. At the end of the Sui Dynasty, in 611 AD, large scale peasant revolts weakened the power of the Emperor, leading to the foundation of the Tang Dynasty. Around the end of Tang Dynasty, in 875 AD, Huang Chao led a very strong peasant revolt, which was suppressed by warlords, and one of them, Zhu Wen, then assumed the power of Tang. There followed a period of fragmentation until the foundation of the Song dynasty.

The Red Turban revolt overthrew the Yuan dynasty and one of its leaders, Zhu Yuanzhang, founded the Ming dynasty. The Ming dynasty was actually brought down by a big peasant revolt, led by Li Zicheng, which was then defeated by the Manchus who founded the Qing Dynasty.

Many other revolts, such as the Taiping rebellion in the 19th century nearly overthrew the Qing dynasty, during a bloody civil war that cost 20 million lives. Overall, since the Qin dynasty, there were more than 30 large scale peasant revolts, covering large parts of China's territory.

The second striking fact is that peasant revolts in China aimed most often at replacing a bad emperor (dynasty) with a good emperor (dynasty). In contrast, in Europe and the West, after the Middle Ages, the few big revolutions like the Glorious Revolution in England, the American revolution, the French revolution, the numerous European revolutions of the 19th century aimed most often at changing political institutions to limit the power of the executive and introduce more inclusive political institutions, led gradually to the establishment of democracies based on universal suffrage.

We present in this chapter a model proposing to make sense of these differences. It is a model of collective action, whereby people's potential payoff from collective action is augmented by a social payoff that differs across cultures, and that is rooted in modern cross-cultural psychology. We take as starting point the difference made by Markus and Kitayama (1991) between different notions of the self that are the foundations for cross-cultural psychological analysis of individualism and collectivism: the *independent* versus the *interdependent* self where the former is associated more with individualism and the latter more with collectivism.

In the following section, we briefly explain how the notions of independent and interdependent self may affect the social payoffs of collective action in different ways in different cultures. We then present a very simple model incorporating those features to analyze how in a collectivist culture collective action to overthrow an incumbent autocrat and replace him with better ruler is easier, while in an individualist culture collective action to change the existing political institutions and introduce new political institutions is easier. We then extend our model to a multiple player model of collective action, including a global

game component. The particular assumptions we make deliver rich results and contribute to the literature on collective action. In the multiple player case, the social payoff from participating in collective action may help alleviate the collective action problem, leading to a unique equilibrium of joint collective action for a large set of parameters of the model. In the global game setup where there is uncertainty about signals received by other players, it is possible that the collective action equilibrium delivers a negative payoff to both players compared to the status quo. These results are, to our knowledge, all novel in the context of collective action games.

4.2 The independent and the interdependent self and types of collective action

The independent self derives its identity only from the inner attributes of the individual. These attributes are considered to reflect the essence of the individual, to be stable across time and context and the combination of these attributes is seen as unique to the individual. These individual inner attributes are significant for defining, regulating and thus predicting the behavior of an individual. The interdependent self, in contrast, derives its identity essentially from relations with others. The self is not a separate identity but is embedded in a larger social group and can be understood only in relation to that larger group. From the point of view of the interdependent self, individual behavior is derived from one's role in different social contexts and from the perception of others' reaction to one's behavior as well as from the perceived effect of one's own actions on others.

These different notions of self have many different implications that can explain the main differences between individualism and collectivism (see the extensive survey in Gorodnichenko and Roland, 2012). Among the many differences, here are just a few that are relevant in the context of this paper. The independent self seeks to know him/herself through inner search of the introspective type. In contrast, the interdependent self seeks to know him/herself through the evaluation of others. People from individualist cultures have a higher need for "self-enhancement" and have a stronger self-serving bias than people from collectivist cultures. In contrast, the need for self-enhancement is less strong for the interdependent self who views him/herself as much more malleable. The interdependent self is concerned more with interpersonal harmony whereas the independent self is concerned with how events affect the individual and helps him or her stand out. A key motivational difference between individualist and collectivist culture is indeed the need to stick out versus to fit in. Both motivations are present everywhere but the former is stronger in individualist than in collectivist cultures where the motivation to fit in is stronger in the latter relative to the individualist culture.

In this chapter, we focus on some implications of the difference between the interdependent and the independent self related to collective action. We will assume that the interdependent self derives a positive payoff from participating in a collective action when such participation corresponds to an existing social norm. As we explain further, such an assumption has roots in Chinese history. The existence of this social payoff can make collective action easier, but only when the revolt is conducted within existing social norms. This is consistent with both the strong frequency of large-scale peasant revolts in China and with its relatively unchanged focus on replacing a bad emperor with a more legitimate one, generating the so-called *dynastic cycle*.

If the focus of a revolt falls outside existing social norms, however, we will assume that the social payoff for the interdependent self is a risky one. The idea is that participating in a revolt, the purpose of which is not sanctioned by a social norm, can lead to social stigmatization in case of failure. People will be blamed for having participated in actions for "foolish" and "unproven" ideals that have brought repression and misery upon the people. If instead a revolt for a revolutionary ideal, such as democracy, is successful, than we will assume that there can be a positive social payoff of *ex post* social recognition for having followed a just cause. This risky social payoff will create reluctance to engage in collective action for institutional innovation and institutional experimentation. Because of this, collective action in collectivist cultures will tend to be more conservative in its focus, aiming to change existing political leaders but not the existing political institutions.

On the latter dimension, we will assume that the social payoff to the independent self differs radically from the payoff to the interdependent self. Since the independent self finds gratification in standing out, there will be a positive social payoff to participation in collective action aiming at institutional innovation. The idea is that participation in collective action can help the individual stand out relative to those generations and cohorts that did not have that opportunity.

The existence of a social norm for revolting against a bad emperor in China is rooted in the doctrine of the "Mandate of Heaven" introduced by the Zhou Dynasty (c. 1046–256 BC) to justify its right to rule, which was taken from the Shang Dynasty (c. 1600 BC–c. 1046 BC). The main idea is that the right to rule is bestowed by Heaven upon a ruler, but if the ruler performs badly, then the right will be withdrawn and bestowed on another good ruler. Given this doctrine, revolting against a bad emperor amounts to help to realize the "Mandate of Heaven", and is given strong cultural appreciation. Despite its emphasis on hierarchy and order, Confucianist doctrine's idea that the ruler loses legitimacy if he does not correctly embrace his responsibilities, is emphasized in at least two theories.

First, in the *Analects*, Confucius is recorded to have said: "good governance consists in the ruler being a ruler, the minister being a minister, the father being

a father, and the son being a son." This means that everyone must behave in the way they are supposed to behave, given their place in the social relationship, whether senior (a ruler or a father) or junior (a minister or a son). The "Mandate of Heaven" and the norm of revolting against a bad ruler follow from the idea that rulers, despite being on top of the social ladder, have the obligation to behave in a virtuous way.

Second, the Confucianist concept of the "Rectification of Names" states that there should be a close correspondence between names on one hand, and things and actual actions on the other hand; otherwise, social order and stability will be jeopardized. Confucius says that people's behavior should correspond to their name, as senior people like the Emperor have more responsibilities than say a local governor, and the more senior name people carry, the higher their responsibilities. The logic is the same as above.

We are also not alone in noting the "Mandate of Heaven", the norm of revolting against a bad ruler, and their role in Chinese history and political culture. For example, Zhao (2009) writes, "The strong performance aspect of state legitimacy allowed the ancient Chinese people to judge their ruler in performance terms. . . . Although most rebellions were ruthlessly repressed, the idea of rising to rebel against an unfit ruler had a legitimate position in Chinese political culture."

To conclude, the norm of revolting against a bad ruler is consistent with Confucianist culture, and the historical literature mentions its importance in Chinese history and political culture.

Collective action has always been difficult to understand, using standard tools of game theory. Because of the externalities to collective action allow people to free-ride on it, collective action has the structure of a prisoner's dilemma. If the payoffs of public action depend, however, on the number of participants, then collective action has the nature of a coordination problem with multiple equilibria: one where all participate, and one where no one participates (see the seminal paper by Palfrey and Rosenthal, 1984). Ostrom (1990) has analyzed how local institutions and norms emerge to solve collective action problems. Closer to our chapter, Gächter and Fehr (1999) have studied in a laboratory setting how social approval affects people's willingness to contribute to a public good.[1] Our chapter is the first to look at differences in social payoffs to collective action in an individualist and in a collectivist culture. The model gives micro-foundations to the more dynamic model of Gorodnichenko and Roland (2013) analyzing the dynamic of democratization and revolt in an autocratic regime. The main result is that collective action to replace the incumbent leader by a new leader is more present in a collectivist culture, while collective action to change the existing political institutions is more present in an individualist culture.

[1] More generally, Frank (1993) looked at the role of status and status-seeking in economics.

In the next section, we present a very simple model where the people are modeled as a single player. The main purpose is to get simple results to compare typed of collective action in the individualist and the collectivist culture. In the next section, we will introduce the multiple player case, using a game-theoretic setup of collective action.

4.3 The basic model

Assume that the utility of an agent depends on the economic payoff of risky collective action : $+a$ if successful, $-a$ if unsuccessful. On top of the presence of this standard payoff to collective action, we assume, as explained above, two additional social payoffs derived from the cross-cultural psychology literature.

The first additional payoff to collective action is the opportunity to "stand out" by possibly being regarded as an institutional innovator in the revolution, like the revolutionary figures of the American and French revolution. We call this payoff b and assume that it is independent of the result of the collective action. To the extent that individuals crave for fame and standing out, this payoff is assumed to be intrinsic to the collective action itself. This payoff gives a positive expected psychological reward to the independent self and is assumed to be stronger in an individualist culture that rewards standing out relative to conformity.

We assume that there is a possible additional payoff c to collective action that arises from self-satisfaction with conforming to the social norm of revolting in cases when revolting is seen as the "just" social action. We assume that this payoff is also independent of the success of collective action but derives from the positive self-esteem feedback for having conformed to an existing social norm.[2] We assume that this additional payoff rewards the interdependent self for conformity to existing social norms and is thus mainly present in a collectivist culture.

To this positive payoff for following the norm, we add a risky payoff to the interdependent self: in case of institutional innovation, there is a positive payoff c, but in case of failure, there is a negative payoff $-d$. As explained above, since there is no preexisting norm for participation in collective action under institutional innovation, because of its novelty, its success can create a positive

[2] The idea of a social payoff to revolting even in the case of failure can be illustrated by the following well known story in Chinese history. When Chen Sheng and Wu Guang told their men why they had decided to revolt against the Qin dynasty (in 209 BC) because heavy rains prevented them from arriving in time to the Yuyang frontier that they were supposed to guard, Chen Sheng said, to encourage the peasant soldiers to rebel: "Since we'll face death anyway, why don't we die for a grand purpose? If one has to die, one has to die like a man. Are the princes and lords and prime ministers born leaders. . . ?" Note that this famous quote also implies that Chen Sheng and Wu Guang had in mind to replace the existing leaders, not to change the existing governance system.

norm rewarding with social recognition those who have participated. On the other hand, failure of the institutional innovation carries also a social stigma for those who participated in an action not sanctioned by social norms, hence the negative payoff to failure.

Given the game-theoretic difficulties of dealing with joint decisions of collective action, we start by assuming that the decision-making process of the masses is equivalent to the decision-making process of a single agent. We will relax this assumption in the next section.

The expected utility from collective action *EU* can thus be written:

$$EU = EP + \alpha_k E_{IND}(A) + \beta_k E_{INT}(A)$$

Where *EP* is the expected economic payoff, $E_{IND}(A)$ the expected psychological payoff to the independent self of chosen action A for the independent self, $E_{INT}(A)$ the expected social payoff to the interdependent self of chosen action A, and α_k and β_k are respectively the weights attached to social rewards for the independent self and for the interdependent self where $k = I, C$ is a cultural index where index I stands for individualist culture and index C stands for collectivist culture. By assumption, and given our above discussion, $\beta_C > \beta_I$ *and* $\alpha_I > \alpha_C$.

We will assume two types of collective action. The first one is a revolt noted *R*. We define a revolt as a popular uprising to overthrow an existing ruler deemed illegitimate and replacing him by a new ruler deemed more legitimate. We call the other type of collective action institutional innovation, noted *I*. Under institutional innovation, the collective action leads to the establishment of new political institutions. Monarchy can be replaced by a republic, autocracy can be replaced by democracy, etc. At the time of the institutional change, these institutions are assumed to be new and hitherto untested. They thus historically represent an important institutional innovation.

We assume that the agent receives a signal $q \in [0, 1]$ denoting the probability of success of a revolt *R*. Similarly, note $\sigma \in [0, 1]$ the probability of success of *I*.

The status quo has an expected payoff of 0. The decision rule will thus be to choose *R* over the status quo, *I* over the status quo or between *R* and *I* if both have a positive expected payoff.

Table 4.1 summarizes our assumptions so far.

Table 4.1 Payoffs of revolt (R) and institutional innovation (I)

Weight	Successful R	Failed R	Successful I	Failed I
	$(Prob\, q)$	$(Prob\, 1-q)$	$(Prob\, \sigma)$	$(Prob\, 1-\sigma)$
Economic payoff (1)	a	$-a$	a	$-a$
Independent-self payoff (α_k)	0	0	b	b
Interdependent-self payoff (β_k)	c	c	c	$-d$

Given our assumptions, the expected utility of R is

$$EU_R = q(a + \beta_k c) + (1 - q)(-a + \beta_k c) = 2qa + \beta_k c - a$$

Similarly, the expected utility of I is

$$\begin{aligned} EU_I &= \sigma(a + \alpha_k b + \beta_k c) + (1 - \sigma)(-a + \alpha_k b - \beta_k d) \\ &= \sigma(2a + \beta_k(c + d)) - a + \alpha_k b - \beta_k d \end{aligned}$$

We can then easily define the following thresholds:

$$\underline{q_k} = \frac{1}{2} - \frac{\beta_k c}{2a}, \quad \underline{\sigma_k} = \frac{a - \alpha_k b + \beta_k d}{2a + \beta_k(c + d)}$$

where $\underline{q_k}$ is the minimum threshold for q so that R is preferred to the status quo and $\underline{\sigma_k}$ is the minimum threshold for σ so that I is preferred to the status quo. One sees immediately that $\underline{q_k}$ is decreasing in β_k. This means that the threshold to engage in a revolt is lower in a collectivist culture than in an individualist culture. This is due to the social norm of participating in a just revolt. Note similarly that $\underline{\sigma_k}$ is decreasing in α_k. In other words, the threshold for engaging in institutional innovation is lower in the individualist culture.

Note however that while $\underline{q_k}$ depends on β_k and not on α_k, σ_k depends both on α_k and on β_k. How does $\underline{\sigma_k}$ vary with β_k? Quick calculations show that $\underline{\sigma_k}$ increases with β_k if $d \geq \frac{a - \alpha_k b}{a + \alpha_k b} c$. Note that $\frac{a - \alpha_k b}{a + \alpha_k b} \leq 1$ so that this condition is in general always satisfied as long as $d \geq c$, i.e. as long as the punishment from the stigma to participating in failed institutional innovation is not lower in absolute terms than the social recognition from success. Note that the condition is always strictly satisfied as long as $\alpha_k > 0$. We thus see that the possible risk of failure associated with institutional innovation may raise the threshold for collective action in that direction in a collectivist culture.

These calculations lead us to our first proposition.

Proposition 1

The threshold for R is lower under a collectivist than under an individualistic culture and the threshold for I is lower under an individualist compared to a collectivist culture.

These very simple calculations thus show that there is a greater ease of collective action to replace a bad ruler in a collectivist culture and a greater affinity for collective action for institutional innovation in an individualist culture. These results follow from the assumptions we made giving positive utility to participation in a collective action following an existing social norm under collectivism, but greater reluctance in the absence of a social norm when there is the risk of a social stigma for failure in action for institutional innovation. Conversely, the positive utility from being a participant in collective action for institutional innovation lowers its threshold in an individualist culture.

What are now the conditions to prefer R over I, or vice-versa, in case the threshold for both is satisfied? This is defined in Proposition 2.

Proposition 2

If $q = \sigma$, and if both I and R are preferred to the status quo, in a collectivist culture, R is preferred over Iif $\sigma < 1$ and $\alpha_C - > 0$; in an individualist culture, I is preferred over R if $b > 0$ and $\beta_I - > 0$.

Proof: The expected payoff of R is greater or smaller than I if

$$\beta_k c + 2qa - a \geq \text{ or } \leq \sigma(2a + \beta_k(c+d)) - a - \beta_k d + \alpha_k b$$
$$\leftrightarrow (1-\sigma)\beta_k(c+d) + (q-\sigma)2a \geq \text{ or } \leq \alpha_k b$$

If $q = \sigma$, the RHS goes to 0 as $\alpha_C - > 0$ and the LHS remains positive as long as $\sigma < 1$. Similarly, the LHS goes to 0 as $\beta_I - > 0$ and the RHS remains positive as long as $b > 0$. **QED.**

Proposition 2 shows that under our assumptions, if the likelihood of success of collective action under I and R are the same, then a collectivist culture has a preference for changing leaders but not the regime, in contrast to the individualist culture. Note that if b is large enough, I can be preferred to R in an individualist culture even if $q > \sigma$, i.e. if the probability of success of collective action for R is higher than for I.

To repeat, there are three key assumptions behind these results:

1) R gives a positive social payoff to the interdependent self for following the social norm of revolt, regardless of the success or not of the collective action;
2) I gives a risky payoff to the interdependent self, contingent on the result of the collective action because there is no existing norm (to follow or break) for I.
3) I gives a positive social payoff to the independent self regardless of the success or not of the collective action. This is because of the expected payoff from standing out. Even if everybody participates in the collective action, there is still a benefit from standing out compared to other generations ad cohorts that do not take part in the collective action.

4.4 Extension to multiple players

The above analysis assumed that the people behave as one homogenous group. We now relax this assumption. Without loss of generality, we assume that there are two groups of players modeled as two single players. The gist of the results in this section will be roughly the same as in the one player situation, but the

Table 4.2 Payoff matrix for revolt (R) versus non revolt (NR) in the two player case

Action	R	NR
R	$2qa-a+\beta_k c, 2qa-a+\beta_k c$	$2\gamma qa-a+\beta_k c, 2\gamma qa-a$
NR	$2\gamma qa-a, 2\gamma qa-a+\beta_k c$	0,0

results are much richer and there are interesting insights relative to the literature on collective action.

Let us start with the case of revolt *R*. As we will see, this case can be readily extended to the case of institutional innovation *I*. We denote again by q the probability of success of a revolt *R* if all agents decide to engage in collective action. If only one group decides to engage in collective action, then the probability of success is denoted by γq, where $\gamma < 1$. This seems reasonable as the action is less likely to be successful if only part of the population participates.

Like in the previous section, if both players decide on collective action, they will get an expected utility of

$$EU_R = q(a+\beta_k c)+(1-q)(-a+\beta_k c) = 2qa+\beta_k c-a$$

If only one player decides on collective action, then the expected payoff to that group is $2\gamma qa+\beta_k c-a$. The expected payoff to the other player is assumed to be $2\gamma qa-a$, i.e. that group does not receive the social reward $\beta_k c$ from revolting, but potentially free rides on its benefit, provided $2\gamma qa-a>0$. Note, however, that free-riding is not the only externality present in this model. If γ is sufficiently small, there is a negative externality imposed on the passive player. Indeed, the decision to engage in collective action may yield a negative payoff for the passive player. Indeed, it is quite possible that $2\gamma qa-a<0$ while $2\gamma qa+\beta_k c-a>0$. Table 4.2 shows the payoffs.

As above, we assume that $q \geq \underline{q_k} = \frac{1}{2} - \frac{\beta_k c}{2a}$. Otherwise, not revolting jointly is always a dominant strategy. All the action here will be taken by variation of γ. Assume first that γ is high, close to 1. Let us look at the strategies of player 1. Suppose player 2 decides not to revolt. Player 1 is strictly better off revolting if $2\gamma qa-a+\beta_k c>0$. This inequality give us a lower bound on γ such that as $\gamma > \underline{\gamma_{kR}} = \underline{q_k} q^{-1}$. Suppose player 2 decides to revolt. Then player 1 is strictly better off revolting because of the additional utility $\beta_k c$ from following the social norm of revolt. A symmetric reasoning can be held for player 2 showing that it is also a dominant strategy to revolt. There is thus a unique Nash equilibrium as long as $\gamma > \underline{\gamma_{kR}} = \underline{q_k} q^{-1}$. Note that $\underline{\gamma_{kR}}$ decreases with q.

Below $\underline{\gamma_{kR}}$, it is easy to see that there will be two equilibria: revolting and not revolting. Indeed, if player 2 revolts, player 1 is better off revolting, again because of the additional utility $\beta_k c$ from following the social norm of revolt. However,

Table 4.3 Payoff matrix for institutional innovation (I) or not (NI) in the two player case

Action	I	NI
I	$(2a+\beta_k(c+d))\sigma - a + \alpha_k b - \beta_k d$, $(2a+\beta_k(c+d))\sigma - a + \alpha_k b - \beta_k d$	$(2a+\beta_k(c+d))\gamma\sigma - a + \alpha_k b - \beta_k d$ $2a\gamma\sigma - a$

if player 2 does not revolt, then player 1 is better off not revolting, since by definition of $\underline{\gamma_{kR}}$, the payoff to revolting $2\gamma qa - a + \beta_k c$ will be strictly negative.

Note that in this game while a player may free-ride on the decision by the other player to revolt, the player benefits even more from participating, due 1) to the increased likelihood of success of collective action (q instead of γq) and 2) to the benefit to the interdependent self $\beta_k c$ from doing so.

Note that without the presence of $\beta_k c$, the lower bound on γ to obtain a unique equilibrium is $\frac{1}{2}q^{-1}$, which is always higher than $\underline{\gamma_{kR}}$, which is $\left(\frac{1}{2} - \frac{\beta_k c}{2a}\right)q^{-1}$, as long as $\beta_k c$ is positive. The higher $\beta_k c$, the further away below $\underline{\gamma_{kR}}$ can be from $\frac{1}{2}q^{-1}$. It is thus possible to generate collective action even when $\underline{\gamma_{kR}}$ is relatively low.

Note finally that $\underline{\gamma_{kR}}$ is decreasing with β_k, as it is a positive function of $\underline{q_k}$, which is decreasing with β_k. Given that, $\beta_C > \beta_I$ the threshold $\underline{\gamma_{kR}}$ is lower in the collectivist culture.

We can do a similar analysis for the decision to engage in institutional innovation I. Table 4.3 below shows the different payoffs.

As in the previous section, we assume that $\sigma \geq \sigma_k = \frac{a - \alpha_k b + \beta_k d}{2a + \beta_k(c+d)}$. The condition for I to be a unique equilibrium is that $(2a + \beta_k c + \beta_k d)\gamma\sigma - a + \alpha_k b - \beta_k d > 0$. which is verified if $\gamma > \underline{\gamma_{kI}} = \underline{\sigma_k}\sigma^{-1}$. Below $\underline{\gamma_{kI}}$, there are two equilibria, I and NI. One verifies easily that $\underline{\gamma_{kI}}$ decreases with α_k. By a similar reasoning to that in the previous section, one also verifies that $\underline{\gamma_{kI}}$ increases with β_k as long as $d \geq c$. Given these two conditions, it is thus the case that $\underline{\gamma_{kI}}$ is lower in the individualist compared to the collectivist culture, given d ≥ c.

The results for R and I are summarized in the following proposition.

Proposition 3

There exist thresholds for γ , $\underline{\gamma_{kR}}$ and $\underline{\gamma_{kI}}$ above which there is a unique equilibrium, respectively R and I. Threshold $\underline{\gamma_{kR}}$ is lower in the collectivist culture and threshold $\underline{\gamma_{kI}}$ is lower in the individualist culture.

In what follows, we want to look more carefully at what happens below thresholds $\underline{\gamma_{kR}}$ and $\underline{\gamma_{kI}}$. The above result is a classic one of multiple equilibria in a coordination game, in the spirit of Palfrey and Rosenthal (1984). If we now

assume that there is some uncertainty among players about q, we can use the global game technology and eliminate multiplicity of equilibria. The two player case is the easiest for the sake of exposition and is in the spirit of Carlsson and van Damme (1993), but we will later extend the analysis to multiple players, and indeed to a continuum of players as in Morris and Shin (2003).

Assume thus that variable q is a random variable and that each player (group of players) receives a private signal $q_i (i = 1, 2)$ such that $q_i = q + \varepsilon_i$ where ε_i has normal distribution $N(0, \delta^2)$. We assume that q, ϵ_1, and ϵ_2 are statistically independent from each other.

Let us now derive the equilibrium of this global game, first for the case of R. Having received signal q_1, player 1 forms the view that signal q_2 (conditional on q_1) has distribution $N(q_1, 2\delta^2)$. Indeed, since $q_1 = q + \epsilon_1$, we have that $q \mid q_1 = q_1 - \epsilon_1 \sim N(q_1 \delta^2)$. Since $q_2 = q + \epsilon_2$, we then have

$$q_2 \mid q_1 = q_1 - \epsilon_1 + \epsilon_2 \sim N\left(q_1, 2\delta^2\right).$$

For any x, agent 1 then assigns $P(q_2 \leq x \mid q_1) = \Phi\left(\frac{x - q_1}{\sqrt{2}\delta}\right)$.

Consider now that player 2 has a switching strategy and decides to revolt only if $q_2 \geq \underline{q_2}$. Given this decision rule, player 1's expected payoff of revolting conditional on the signal received is given by

$$E\left[\left(1 - \Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right)\right)(2qa - a + \beta_k c) + \Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right)(2\gamma qa - a + \beta_k c) \mid q_1\right]$$
$$= 2aq_1\left(1 - (1-\gamma)\Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right)\right) - a + \beta_k c \equiv f\left(q_1, \underline{q_2}\right)$$

The expected payoff of not revolting conditional on the signal received is given by

$$E\left[\left(1 - \Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right)\right)(2\gamma qa - a) + \Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right) \cdot 0 \mid q_1\right]$$
$$= \left(1 - \Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right)\right)(2\gamma q_1 a - a) \equiv g\left(q_1, \underline{q_2}\right)$$

Player 1 should thus revolt if and only if $f\left(q_1, \underline{q_2}\right) - g\left(q_1, \underline{q_2}\right) > 0$.

Note that

$$f\left(q_1, \underline{q_2}\right) - g\left(q_1, \underline{q_2}\right)$$
$$= a\left[2(1-\gamma)q_1\left(1 - \Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right)\right) + (2\gamma q_1 - 1)\Phi\left(\frac{\underline{q_2} - q_1}{\sqrt{2}\delta}\right)\right] + \beta_k c$$

is increasing monotonically in q_1 if $\gamma < \frac{1}{2q_1}$. Given that $\underline{\gamma_{kR}} < \frac{1}{2}$, and that the analysis with global games is done for those values of γ for which there are multiple equilibria, i.e. below $\underline{\gamma_{kR}}$, this condition will always be satisfied. Then given $\underline{q_2}$, there will be a threshold level for q_1 solving $f\left(q_1, \underline{q_2}\right) - g\left(q_1, \underline{q_2}\right) = 0$, above which player 1 will prefer to revolt.

We can make a similar reasoning for player 2.

There will then be a Nash equilibrium $(\underline{q_1^*}, \underline{q_2^*})$ that will thus solve

$$f\left(\underline{q_1^*}, \underline{q_2^*}\right) - g\left(\underline{q_1^*}, \underline{q_2^*}\right) = 0,$$
$$f\left(\underline{q_2^*}, \underline{q_1^*}\right) - g\left(\underline{q_2^*}, \underline{q_1^*}\right) = 0.$$

The solution is then calculated to be $\underline{q_1^*} = \underline{q_2^*} = \underline{q^*} = \frac{1}{2} - \frac{\beta_k c}{a}$. Note that this threshold is lower than in the one player case. This is an interesting observation, meaning that players are individually more willing to engage individually in collective action when its probability of success is lower! This seems surprising given that usually free-riding is the externality associated to collective action. As we saw above, free-riding is also present in this model as the passive player benefits from the action of the other player. However, there is also a negative externality associated with the fact that, while participating in the possible upside and downside of collective action, the passive player does not enjoy the social payoff from the collective action, leading thus to prefer switching to participate in the revolt, even when q is relatively low compared to the single player threshold. Let us call this effect the "reluctant revolutionary" effect. This effect is stronger in the collectivist culture as $\underline{q^*}$ decreases with β_k. If $\beta_k = 0$, the threshold is the same as in the one-player game.

An implication of the above reasoning is that the R equilibrium may be inefficient, i.e. deliver a negative expected payoff for both players compared to the status quo! This is because of the "reluctant revolutionary" effect mentioned above. If one player decides on collective action, the other one prefers to participate in the revolt because of the negative externality the other player would otherwise impose. Given that q is low enough, both nevertheless get a negative expected outcome. To our knowledge, this is the first model to deliver the surprising result that the collective action equilibrium can be the unique equilibrium even though both players receive negative payoffs in equilibrium. An intuitive way of seeing it is that even though both suffer under the collective action, deviating is not a profitable action for either player. This result is specific to the global game. With uncertainty about the signal received by the other player, a player may decide to engage in revolt to avoid the even more negative payoff received when remaining passive if the other player decides to revolt.

Looking now at the case of I, we get the corresponding

$$f\left(q_1,\underline{q_2}\right)-g\left(q_1,\underline{q_2}\right)$$
$$=a\left[2(1-\gamma)\sigma_1\left(1-\Phi\left(\frac{\underline{\underline{\sigma_2}}-\sigma_1}{\frac{\underline{\underline{q_2}}-q_1}{\sqrt{2}\delta}}\right)\right)+(2\gamma\sigma_1-1)\Phi\left(\frac{\underline{\underline{q_2}}-q_1}{\frac{\underline{\underline{q_2}}-q_1}{\sqrt{2}\delta}}\right)\right]$$
$$+\beta_k(c+d)\sigma_1\left[1-(1-\gamma)\Phi\left(\frac{\underline{\underline{\sigma_2}}-\sigma_1}{\frac{\underline{\underline{q_2}}-q_1}{\sqrt{2}\delta}}\right)\right]+\alpha_k b-\beta_k d$$

This expression is increasing in σ_1 when $\gamma<\frac{1}{2\sigma_1}$, which is automatically satisfied, using a similar reasoning as above. Then given $\underline{\sigma_2}$, there will be a threshold $\sigma_1$solving $f\left(\sigma_1,\underline{\sigma}\right)-g\left(\sigma_1,\underline{\sigma_2}\right)=0$, above which player 1 will prefer to engage in institutional innovation. The Nash equilibrium $(\underline{\sigma_1^*},\underline{\sigma_2^*})$ will thus solve

$$f\left(\underline{\sigma_1^*},\underline{\sigma_2^*}\right)-g\left(\underline{\sigma_1^*},\underline{\sigma_2^*}\right)=0,$$
$$f\left(\underline{\sigma_2^*},\underline{\sigma_1^*}\right)-g\left(\underline{\sigma_2^*},\underline{\sigma_1^*}\right)=0.$$

The solution is then $\underline{\sigma_1^*}=\underline{\sigma_2^*}=\underline{\sigma^*}=\frac{a-2\alpha_k b+2\beta_k d}{2a+(1+\gamma)\beta_k(c+d)}$, which is decreasing in α_k, and increasing in β_k, as long as $d\geq\frac{(1+\gamma)a-2\alpha b(1+\gamma)}{(3-\gamma)a+2\alpha b(1+\gamma)}c$, which is satisfied as soon as $d\geq c$

This reasoning leads us to formulate the following proposition:

Proposition 4

If there is uncertainty over q and σ, and if the noisy signals received by players are statistically independent, for values of γ lower than $\frac{1}{2q_1}$ and $\frac{1}{2\sigma_1}$ then there exists a unique equilibrium threshold $\underline{q^*}=\frac{1}{2}-\frac{\beta_k c}{a}$ and $\underline{\sigma^*}=\frac{a-2\alpha_k b+2\beta_k d}{2a+(1+\gamma)\beta_k(c+d)}$ above which players decide to engage in collective action respectively for R and I. The threshold is lower for R in a collectivist culture and for Iin an individualist culture.

Let us now go a bit deeper in the comparison of thresholds for the collectivist and individualist culture. Given the assumptions of our model, in the individualist culture, β_k is small. We can see that as $\beta_k\to 0$, $\underline{q^*}>\underline{\sigma^*}$. The threshold for I is thus lower than for R. Similarly, for the collectivist culture, as $\alpha_k\to 0$, $\underline{\sigma^*}\to\frac{a-2\beta_k c+2\beta_k(c+d)}{2a+(1+\gamma)\beta_k(c+d)}>\frac{a-2\beta_k c}{2a}=\underline{q^*}$. We thus have the opposite results: the threshold for R is lower than for I.

We saw above that the threshold for q in the case of R is lower in the global game than in the single player game, leading potentially to an inefficient equilibrium under R compared to NR. What about for I? Here the answer is different for individualism and for collectivism. In the individualist culture, as $\beta_k\to 0$, the threshold in the single player game $\underline{\sigma}=\frac{a-\alpha_k b+\beta_k d}{2a+\beta_k(c+d)}\to\frac{a-\alpha_k b}{2a}$ whereas in the global game we have $\underline{\sigma^*}=\frac{a-2\alpha_k b+2\beta_k d}{2a+(1+\gamma)\beta_k(c+d)}\to\frac{a-2\alpha_k b}{2a}$. Given that $\frac{a-2\alpha_k b}{2a}<\frac{a-\alpha_k b}{2a}$, $\underline{\sigma^*}<\underline{\sigma}$.

In other words, the I threshold is lower in the global game than in the single player case in the individualist culture. This is a similar effect as for R. The psychological effect b of participating in I is not reaped when not participating in collective action. The risk of missing out on this, and only getting the expected economic payoff, thus leads a player to engage in collective action, even for low values of σ compared to the single player case. In the collectivist culture, however, as $\alpha_k \to 0$,

$$\underline{\sigma} = \frac{a - \alpha_k b + \beta_k d}{2a + \beta_k (c+d)} \to \frac{a + \beta_k d}{2a + \beta_k (c+d)} \quad \text{and}$$

$$\underline{\sigma^*} = \frac{a - 2\alpha_k b + 2\beta_k d}{2a + (1+\gamma)\beta_k (c+d)} \to \frac{a + 2\beta_k d}{2a + (1+\gamma)\beta_k (c+d)}.$$

Comparing both expressions, we see that $\underline{\sigma^*} > \underline{\sigma}$. The reason is related to the extra risk involved in engaging in I in the collectivist culture. In case of failure, there is the stigma d attached to it, which is at least as high as the benefit c. If d were equal to 0, we would have $\underline{\sigma^*} < \underline{\sigma}$ and get a similar result to the ones above.

These results give us the following proposition.

Proposition 5

In the global game defined in proposition 4, i) in the individualist culture, $\underline{q^*} > \underline{\sigma^*}$, and in the collectivist culture, $\underline{\sigma^*} > \underline{q^*}$; ii) the threshold for R is lower than in the single-player game for both individualism and collectivism, but the threshold for I is higher than in the single-player game for collectivism, but lower for individualism.

To conclude this discussion of two player collective action, the main difference with the one player case is thus the threshold for collective action for both R and I. The results are nevertheless remarkably richer than those of the one player case. We have the "reluctant revolutionary" effect on top of the standard free-riding effect on collective action and the standard coordination problem. Moreover, in the global game the collective action equilibrium may be inefficient and dominated by the status quo.

Coming back to one of the main themes of the chapter, the comparison of types of collective action, an important conclusion that also follows from the whole discussion is that proposition 2, stating that R is preferred over I under collectivism, and vice-versa under individualism, once the thresholds for both R and I are both exceeded, remains completely valid in the two player case once one adjusts for the thresholds.

4.5 Conclusion

We have presented in this chapter a model of different types of collective action to compare the propensity to engage in collective action for a collectivist and

for an individualist culture. We have considered two types of collective action: one where the incumbent leader is replaced by another one, say a bad autocrat replaced by a better one, but without institutional change; and another form of collective action aiming at changing the political institutions. We have introduced social payoffs to participation in collective action for the independent self and for the interdependent self, where the former is mainly present in the individualist culture and the latter mainly present in the collectivist culture. This may shed light on the different histories of collective action in both cultures, as illustrated by the comparison between Chinese and European history since the Qin and Han dynasties and the Roman Empire.

The model also yields new insights on the collective action game, relative to the literature. In the multiple player case, these social payoffs lead to an alleviation of the collective action problem, differentially for the two types of collective action in the individualist and collectivist culture. These social payoffs create a "reluctant revolutionary" effect that can more than offset the traditional free-rider effect and push a player to participate in collective action in order not to lose out on the social payoff. This effect may even lead, in the context of a global game, to a payoff of collective action that is lower than the status quo for all players.

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