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Noblesse Oblige?

Determinants of Survival in a Life and Death Situation

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Abstract: This paper explored the determinants of survival in a life and death situation created by an external and unpredictable shock. We are interested to see whether pro-social behaviour matters in such extreme situations. We therefore focus on the sinking of the RMS Titanic as a quasi-natural experiment do provide behavioural evidence which is rare in such a controlled and life threatening event. The empirical results support that social norm such as "women and children first" survive in such an environment. We also observe that women of reproductive age have a higher probability of surviving among women. On the other hand, we observe that crew members used their information advantage and their better access to resources (e.g. lifeboats) to generate a higher probability of surviving. The paper also finds that passenger class, fitness, group size, and cultural background matter.

JEL Classifications: D63; D64; D71; D81

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How selfish soever man be supposed, there are evidently some principles in his nature, which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it.

The Theory of Moral Sentiments (Adam Smith 1969).

I. INTRODUCTION

At the very core of economics is the question of scarcity, or "how society makes choices concerning the use of limited resources" (Stiglitz 2000, p. 14). To achieve utility-maximization from the limited set of resources traditional economic models assume that individuals are exclusively pursuing their material self-interest. The assumption has shown to be useful in many cases. However, substantial evidence has been generated that other motives such as, for example, altruism, fairness, or morality affect the behaviour of many individuals. People sometimes punish others who have harmed them or reward others who have helped them, sacrificing their own wealth (Camerer, Loewenstein, and Rabin 2004). People donate blood or organs without being paid for and donate money for charitable purposes. In wartime many individuals volunteer and are willing to take high risks as soldiers (Elster 2007). Citizens vote in elections incurring more private costs then benefits and people are paying more taxes that a traditional economic-of-crime model would predict (Torgler 2007). Individuals also help others in many situations on the job (Drago and Garvey 1998). In many experiments subjects have been shown to care about aspects as fairness, reciprocity, and distribution. Ultimatum experiments have shown that the modal offer is (50,50), that the mean offer is somewhere around (40,60), and that the smaller the offer, the higher the probability that the offer will be rejected (Ochs and Roth 1989, Roth 1995). We also observe helping is a key element in our work environment: "Within every work group in a factory, within any division in a government bureau, or within any department of a university are countless acts of cooperation without which the system would break down. We take these everyday acts for granted, and few of them are included in the formal role prescriptions for any job" (Katz and Kahn 1966, p. 339).

Individuals compare themselves with their environment and care greatly about their relative position, which influences individual choices. Thus, not only is the absolute level of an individual's situation important (e.g., income), but also the relative position. Researchers have included the concept of interdependent preferences to allow for social comparison (e.g., Becker 1974, Easterlin 1974, Scitovsky 1976, Schelling 1978, Pollak 1976, Frank 1985, Clark, Frijters and Shields 2008, Akerlof and Yellen 1990). Frank (1999) emphasizes that research provides "compelling evidence that concern about relative position is a deep-rooted and ineradicable element in human nature" (p. 145).

Thus, several approaches try to take into account the deviation of a self-interested model extending the motivation structure (e.g. Becker 1974, Rabin 1993, Andreoni and Miller 2002, Dufwenberg and Kirchsteiger 1999, Fehr and Schmidt 1999, Bolton and Ockenfels 2000, Sobel 2005, Frey 1997). In general, Thaler (2000) stresses that the Homo Oeconomicus will evolve to Homo Sapiens: "As economists become more sophisticated, their ability to incorporate the findings of other disciplines such as psychology improves" (p. 140).

Despite the large amount of studies in this area there is hardly any empirical evidence that allows seeing whether interdependent preferences and pro-social behaviour matter in extreme situations such as *life and death situation*. This paper tries to reduce this shortcoming by exploring this question using data from the sinking of the RMS Titanic, the most recognizable maritime disaster in history. While the precipitous loss of life from this tragedy was indeed sorrowful, the event provides us with an opportunity to utilize the event data to better understand the decision making process that is made under these extreme pressures. Individuals are forced to make choices that affect their probability of surviving. What makes this event interesting for research is that it is an enclosed and controlled event, much like a natural field experiment, where the majority of exogenous factors are controlled and the endogenous factors can be tested and investigated. The environmental or situational conditions were identical for every person on board of the Titanic. This allow us to explore behavioural reactions to such an external shock, as well as to investigate people's behaviour under scarcity. The issue of scarcity or shortage arose due to the severe lack of lifeboats, the Titanic had only 20 designed to carry 1178 people and the problem was further exacerbated by the panicked deck crew, who began launching

life boats that were not at capacity. This meant an *excess of demand* situation in the sense that people wishing to survive had to compete with others on board for a place. A failure to secure a seat virtually guaranteed death, as the average water temperature of the surrounding ocean was about 2 degree Celsius (35 Fahrenheit); any survivors of the sinking vessel left in the water would quickly freeze to death. We can expect that there is a certain level of agreement among those in the boat and probably those others waiting for a lifeboat to limit the lifeboat to its maximum safe load to avoid that the boat is in serious danger (Martin 1978). In addition, we can largely exclude that a potential helping behaviour could be driven by *future* reciprocity, a key element in the helping literature (e.g. Goulder 1960, Batson et al. 1979). A life and death situation can be seen as a "one-shot game". Moreover, previous research has shown that legitimacy affects helping behaviour. Legitimate need elicits more help than does illegitimate need (e.g., own laziness) (Schwartz and Flieshman 1978, Berkowitz 1969). In our case, people are confronted with an "external shock" which helps to control in a substantial manner legitimacy.

Thus, the intention of the paper is to investigate the decisions made under these extreme conditions and see if the survival outcomes fit with the literature on interdependent preferences. The key question is whether we are able to observe social norms, fairness and social preferences in a life or death situation.

II. THEORETICAL BACKGROUND

Previous studies have explored the link between fairness and shortage using survey data. Kahneman et al. (1986) have shown in telephone surveys of randomly selected residents in two Canadian metropolitan areas that people consider the use of prices to eliminate the excess of demand to be unfair. This is consistent with the observation that firms do not change prices and wages as often as traditional economic theory would suggest. Moreover, we also observe formal laws that penalize sellers who take advantage of shortages through a price rise of water, fuel and other necessities after a natural disaster (Cameron, Loewenstein, and Rabin 2004). Frey and Pommerehne (1993), Savage and Torgler (2008) replicated the study using European samples. They found similar results. In a shortage situation an allocation process in line with tradition (first come, first served) is perceived to be fairest, followed by

administration allocation procedures. However, compared to these previous studies we explore *behavioural* consequences of an excess of demand in a *life and death* situation.

Our research focus is closely linked to the question whether we observe in line with the traditional economic approach that people behave according to the notion "every man for himself" or whether a "helping hand" effect is observable. Interestingly, helping others is not uncommon. Perlow and Weeks (2002) stress that helping behaviour is required within organizations for efficiency, flexibility, learning and innovation: "Therefore, it has never been more important for us to understand why people help each other at work- and why they don't (p. 343). Shotland and Stebbins (1983) refer to two lines of thoughts, an "altruism school" with the premise that people have a need (innate or acquired) to help others in need or a hedonistic base that suggests that people weigh the impact of benefits and costs to themselves to reach the decision to help or not (p. 36). The second one is close to a traditional economic approach.

Helping behaviour is not only linked to altruism (Piliavin and Charng 1990), but also reciprocity or exchange (Oberholzer-Gee 2007, Fehr et al 2002, Henrich 2004). The idea of reciprocity is to help those who have helped us. Exchange not only focuses on direct reciprocity but also on expectations that leads to solidarity and indirect reciprocity in more anonymous settings such as helping lost tourists (Rabinowitz et al. 1997). However, as discussed in the introduction, we are able to exclude as well as possible such a motivation due to the source of our data set.

Altruistic motivation has been defined as the desire or the motivation to enhance as the ultimate goal the welfare of others even at a net welfare loss to oneself (Batson 1992, Elster 1997) and an *altruistic act* as "an action for which an altruistic motivation provides a sufficient reason" (Elster 1997, p. 95). However, altruistic behaviour is often framed as being somewhat egoistic. It is stressed that what appears to be motivated by a concern for someone is often ultimately driven by selfish motives (Piliavin and Charng 1990). The differentiation between motivation and act is useful as identifying altruistic motivation is problematic. For example, we observe a "warm glow effect" if people like to give someone else something because it makes *them feel good*. Piliavin and Charng (1990) summarizing the literature refers to a "paradigm shift" that acknowledges the strength of altruism: "The central point we

attempt to make in this review is that the data from sociology, economics, political science, and social psychology are all at least compatible with the position that altruism is part of human nature. People do have "other regarding sentiments", they do contribute to public goods from which they benefit little, they do sacrifice for their children and even for others to whom they are not related" (p. 29).

If people sacrifice their life or if they increase the fitness or the survival possibility of others in the Titantic disaster at the expense of their own survival, we can *observe* altruistic behaviour. Self-sacrificing can be seen as an extreme form of altruism. Krebs (1991), e.g., stresses: "On my definition of altruism, behaviors directed toward the enhancement of the welfare of another increase in altruism in proportion to the anticipated costs to self: Risking your life to save a drowning person is more altruistic than throwing him or her a lifesaver" (p. 137). A person could have done better for herself not helping others and therefore ignoring the effects of her choice on others (Margolis 1982). Such a notion is consistent with the social biology definition of altruism (Wilson 1975).

There are various approaches to model altruistic behaviour. An altruistic individual *i* would have the following function:

$$U_i = U_i (s_i, s_j), \tag{1}$$

where s_i, s_j measure the survival probability of *i* and other individuals *j*. If i was an egoist the utility function only depends on his own survival. This can be modeled using the following specific utility function:

$$U_i(s) = s_i + \sum_{j \neq i} \lambda_{ij} s_j \tag{2}$$

λ_{ij} is a factor that shows how much individual *i* cares about *j*. If *i* doesn't care at all, *i*'s utility only depends on the own survival. A positive λ_{ij} reflects altruism. The utility of *i* increases when individual *j* survives. On the other hand, a negative λ_{ij} reflects spite (Sobel 2005). The utility of *i* decreases if individual *j* has a higher

probability of surviving. The degree of λ_{ij} depends on the level closeness between i and j. Higher positive values are expected for family members and friends.

Moral values and personal norms are implicated in altruism (Piliavin and Charng 1990). Altruistic motivation may be driven by moral norms such as helping other in distress or sharing equally (Elster 2006). Norms are the generally accepted conditions under which society functions guiding how individuals act and behave towards each other, adopted and enforced by members of that society and not always in the best interest of any particular individual with in that society (Elster 1985). Elster (2007) sees moral norms as unconditional while social norms are conditional and therefore influence by the presence or the behaviour of other people (p. 104.). A key norm that we are going to explore is "women and children first". Interestingly, there is no international maritime law that requires that women and children are first rescued. Such a social norm was first documented during the sinking of HMS Birkenhead in 1852. The Birkenhead sank only twenty-five minutes after having struck the rocks. The seven women and thirteen children were rowed away from the wreck to safety. The Captain Seton drew his sword ordering men to "Stand an' be still" (Kipling 1892) to avoid that men rushed to the lifeboats putting the life of women and children in danger. Similar norms can be found in other areas where people are evacuated. Humanitarian agencies are often evacuating "vulnerable" and "innocent" civilians such as women, children and elderly person first. The Geneva Convention provides special protection and evacuation priority for pregnant women and mothers of young children (Carpenter 2003).

How can we explain that such a social norm may arise? Helping children provides the possibility of guaranteeing future generations and women provided at that time the key role of caregivers. Thus, this may justify why women were also considered to be rescued. We observe behavioural evidence that is consistent with the norm of social responsibility. For example, studies report that motorists are more willing to stop on a busy street for a woman who was pushing a baby carriage than pushing a grocery cart (Harrell 1994). Helping behaviour is also visible in common threat situations (Batson et al. 1979). We may observe in general a higher level of helping behaviour due to the situation of a common threat that may generate a "we-feelings" and as a consequence a concern for the welfare of others (Worman 1979). In

other words closeness is strongly correlated with helping behaviour (Amato 1990) and being involved together in external shock may induce closeness.

Eagly and Crowley (1986, p. 301) report in their meta-study that chivalrous and heroic acts supported by the male gender role matters. The results indicate that men are more-helpful than women if women perceive helping behaviour as more dangerous than men, the audience witnesses the helping act and other potential helpers were available which was not robust in the multivariate analysis. Moreover, women receive more help than men and males believed themselves more competent and more comfortable in helping than females. This would suggest that we observe a higher probability of survival among females.

In addition, sociobiology also stresses the relevance of the "procreation instinct". The survival of a species relies on its progeny then a high value must be placed upon females of reproductive age as a valuable resource. Social norms may be created to protect the reproductive and child-rearing role of women. It is an attempt to protect children rather than a result from a greater value to women's life. A potential shortage of women would limit the number of offsprings, while a shortage of men would not (Felson 2000).

In humans the period of peak reproduction is between the ages of 15 and 35 (A.S.R.M. 2003), prior to 15 on average females are not reproductively functional and after the age of 35 begins the slowing of the reproductive cycle until at about 50 the reproductive function is lost. Others also stress that the social norm emergence of helping women may be related to a stronger physical and structural vulnerability women (Felson 2000).

Females may also have a strong incentive to guarantee the survival of their kids in a Titanic event. In the study of anthropology *"parental investment"* is an important concept. It argues that females of most species invest more in the survival of their offspring that does the males. Females invest a range of benefits over a period of time for the offspring from the gestation period, lactation, predatory protection and education (Geary 1998) where as the males investment is much smaller. It is because of this much larger investment by the females that the opportunity cost of losing offspring is much higher as is the drive to ensure offspring survival is much stronger (Campbell 1999). It has been shown that the mortality rates of children with a

surviving mother are 1.4 times higher than those without (Voland 1998), and that the survival rates of offspring can be directly linked to maternal survival (Bjorklund and Shackelford 1999). Under these conditions it would be expected that females with children would be much more wary of possible danger and would aggressively fight other females to ensure a safe haven (Cashdan 1997). Moreover, it has been stressed that the sex that puts in greater parental investment to promote the survival of offspring, is the more valued resource (Trivers 1972, Eswaran and Kotwal 2004).

We have discussed in the introduction several cases where we observe altruistic behaviour among human beings. Interestingly, altruistic behaviour is also reported among animals (Wilson 1975, pp. 121-129). Many examples can be observed among social insects. For example, the solider caste of most species of termites and ants place themselves in maximum danger positions and use alarm communication that is closely coupled with suicidal attack behaviour. Bees and wasps have a high readiness to give their lives away upon slight provocation to defend relatives. Adult mooses, zebras, or kudus interpose themselves between predators and the young. Adélie penguins help defend nests belonging to others against the attacks of skuas. Birds use the instrument of distracting the enemy to draw it away from the protected animal (e.g. eggs or young) (Montgomerie and Weatherhead 1988). We also observe the reduction of personal reproduction in order to favour the reproduction of others. For example, food sharing can be found in many situations (e.g. among social insects where self-sacrificing is observable).

III. EMPIRICAL RESULTS

Amato (1990) criticizes that a large amount of literature in this area of helping is laboratory-based: “Researchers who value the rigor of the laboratory have been reluctant to extend the study of prosocial behaviour to everyday life, where the possibility of control is minimal” (p. 31). Working with the Titanic data provides an alternative strategy to explore whether “social norms of helping” survive in a real life and death situation. We cannot observe the detailed rescue process. However, we can evaluate the overall outcome which provides an indication about the level of social norms or altruism among the crew and the passengers.

The dependant variable in this empirical model is a dummy that indicates whether an individual survived the disaster or not (survived = 1), as earlier mentioned individuals will modelled in an economic survival function $S_i = \alpha + \beta X_i + \varepsilon_i$ that is estimated using probit models. We are also calculating the marginal effects due to the non-linear form of the probit model to be able report and discuss in detail the quantitative effects. Our gender variable (female=1) will be a key factor that we will explore. We predict that the coefficient is statistically significant with a positive sign. In addition, we will observe whether children, women with children have a higher probability to survive. To measure the age range of a child we use the United Nations provisional guidelines of standard international age classifications (United Nations 1984). The guidelines classify children as being up to the age of 15. Moreover, to develop further age dummies we rely on an age notion that the British royal commission used in 1870-4 and which appeared in a subsequent Act in 1875 in regards to age benefits. The transition into "Old age" was defined to begin at 50 (Arias 2004, Boyer 1988, Eysenck 2004, Gorsky 1998). We will also explore whether females in their reproductive age are more likely to survive compared to other women. Moreover, we will check whether individuals or females with a larger potential pool of helpers (family members) have a higher probability of surviving.

In addition to control for gender, age and family or travel group size[1], we also explore the following independent variables: passenger-class, crew member, and nationality. The data was generated from numerous sources considering in particular the *Encyclopaedia Titanica.* Passengers were separated into three different classes, namely: first class, second class and third class. It can be expected that first class passengers tried to obtain preferential treatment. A higher level (bargaining) power, better access to information about imminent danger, persons of power and decision makers such as leading crew members may lead to a higher probability of surviving being able to get a better access to lifeboats. Moreover, first class cabins were closest to the boat deck. We control for nationality as previous studies on helping behaviour report cultural differences (Perlow and Weeks 2002). Moreover, it is usual to explore differences between the crew and the passengers. Crew members are better prepared for a catastrophic event and are also in the position of obtaining the information

[1] singles, singles with kids, singles with servants, couples, couples with kids, couples with servants, families/friends, families/friends with kids and families/friends with servants. The families/friends groups include extended family groups and groups of friends travelling together as a party.

earlier than the passengers. They could use this information advantage to generate a higher survival rate. They have also better access to important resources such as lifeboats. On the other hand, they are restricted by the expectation to be among the very last to leave the sinking ship.

Table 1 presents the empirical results for the first set of estimations. We begin by first examining if there is an expected gender effect. In the first four specifications we only include the coefficient FEMALE in the specification, focusing on all the individuals on board of the Titanic (see specification 1), only passengers (2), crew members (3), and couples (4). The results indicate that there is a strong gender effect. Being female rather than male increases the probability of surviving between 23.7 (specification 3) and 53.9 percentage points (specification 4). This is quite a substantial quantitative effect. Interestingly, females have a lower probability to survive among crew member than among passengers. Moreover, we observe that the survival rate of females increase when focusing only on couples. In sum, the gender effect remains robust in all the 11 regression that we present in *Table 1*. The effect even increases after controlling for further factors (see specification 5 to 11).

In a next step we are interested in exploring whether children have also a higher probability of surviving. In specification (5) we focus only on passengers controlling for passenger class, using the age dummies AGE Sub 15 (age 15 and below), AGE 16-50 and AGE 51+ (reference group) to explore the age-survival relationship. The results support the notion that children have a higher probability of surviving than other age groups reporting the largest marginal effects. Being a child rather than a person AGE 51+ (reference group) increases the probability of surviving by 32 percentage points. Moreover, the coefficient AGE 16-50 is also statistically significant. Thus, we find a negative relationship between age and survival probability.

Specification (5) and the following ones in *Table 1* also show that first and second class passengers have a higher probability of surviving. Being in the first class as opposed to third class (which is the reference group) increases the probability of surviving by around 40 percentage points. Thus, more (bargaining) power, better access to information and lifeboats increases the probability of surviving quite substantially.

In specification (6) we work with the entire data set using a CREW dummy variable. The results show that crew members do take advantage of having more possibilities to acquire resources and having a higher level of information that promotes their survival rate. Thus, their behaviour is more in line with a self-interested approach.

In a next step specification (7) and in the following ones we explore whether having a child increases the survival rate of an individual. This is indeed the case. Having a child increases the probability of surviving by overall more than 20 percentage points. This effect in part explains not only the social norm of children first, but also the parental investment norm. By having children, parents (especially mothers) will fight much harder for them to survive. Helping children provides the possibility of guaranteeing future generations and women had the main function as caregivers during that time. In specification (8) we again focus on couples only. We find that passenger class and children also matter. In this specification we observe the strongest gender effect. This could be explained by the husbands and fathers fighting stronger for their partners and offsprings to secure a lifeboat seat and then perishing as they did not obtain a seat themselves.

Specifications (9) to (11) allow us to explore whether being active within a small or large group increases the probability of survival. Joint efforts may lead to a higher probability of surviving, but may induce a lower level of flexibility in critical situations. The results indicate that both coefficients, the one for small groups (couples) and large groups (families), are negative. Thus, people acting alone have a higher probability of surviving. There is even a statistically significant difference to the smaller group.

Finally, we control in the last two specifications in *Table 1* for nationality. First we include a dummy for the single largest group: people from England. We find that English people have a lower probability of surviving. To deal with the heterogeneous structure of the reference group in specification (10) we use people from England as the reference group in specification (11) and compare them with other nationalities such as the USA, Ireland, Sweden and the remaining countries. Interestingly, the results show that Americans have ceteris paribus the highest probability of surviving.

Next we investigate the survival factors among females. This allows us to test, for example, whether a higher priority is placed upon females in their reproductive age. We therefore build three dummy variables, namely age16-35, age below 16 and age36+. *Table 2* presents the results. The findings indeed indicate that women in their reproductive age are more likely to survive. Compared to the reference group (age 36+) their probability increases by more than 16 percentage points (see specification 12). This result remains robust after including further factors (see other specifications).

Also here we observe a passenger class effect. *Table 2* shows that the class coefficients report the largest marginal effects. Being a first class passenger increased the probability of surviving among women by around 40 percentage points. Interestingly, there is no statistically significant difference between children and the reference group. One reason could be that several of women above the reproductive age may be active as caregivers. Specifications (14) to (18) show that having a child increases ceteris paribus the probability of surviving among women. Interestingly, we also observe that female crew members have a higher probability of surviving. The quantitative difference is quite substantial (close to 20 percentage points). On the other had, being in a small group (only with a partner) reduces the probability of surviving while being part of a larger group (family) does not lead to a statistically significant difference in relation to women who are travelling alone. Finally, *Table 2* also shows that nationality doesn't matter. Thus, the advantage of being a US citizen disappears once you focus only on women.

IV. CONCLUSIONS

There is not much evidence available that explores whether interdependent preferences and pro-social behaviour matter in extreme situations such as *life and death events*. This paper tries to reduce this shortcoming by exploring this question using data from the sinking of the Titanic. This data set allows us to explore not only the behavioural consequences in an extreme event, but also provides evidence how people react in a situation where there is an *excess of demand* due to the shortage of lifeboats. Moreover, the explored event can be seen as a quasi-natural experiment. The environmental or situational conditions were identical for every person on board

the Titanic. The event can be seen as an external shock that affected all people in the same manner. In addition, we can largely exclude that potential helping behaviour could be driven by *future* reciprocity. Such a life and death situation can be seen as a "one-shot game".

The results indicate a strong support that social norms and altruism matters. The norm "women and children first" is visible in such a life and death situation. Being female rather than male increases the probability of surviving between 23.7 and 53.9 percentage points, depending on the specification used. This is a large quantitative effect. Interestingly, females have a lower probability to survive among crew member than among passengers. However, the effect is still quite substantial (23.7 percentage points). Moreover, we observe that the survival rate of females increase when focusing only on couples. Similarly, being a child rather than a person AGE 51+ (reference group) increases the probability of surviving around 30 percentage points. Comparing the survival probability among women we observe that having a child and being in the reproductive age has strong and robust impact on the survival probability. Having a child also increases the probability of surviving when considering also males. Such results are in line with socio-biology theories (e.g. procreation instincts or parental investment) that we discussed in the theoretical part. The findings are also consistent with previous results that report that males are more willing to help in critical situations (e.g. chivalrous and heroic behaviour).

We also observe a strong effect of social class. Passengers of the first and second class have a higher probability of surviving. Preferential treatment, a higher level (bargaining) power, better access to information about imminent danger, persons of power and decision makers such as leading crew members may lead to a higher probability of surviving being able to get a better access to lifeboats. Moreover, they were closer to the boat deck. Similarly, it seems that crew members used their information advantage and their better access to resources (e.g. lifeboats) to generate a higher probability of surviving.

In sum, the intention of the paper was to investigate the decisions made under these extreme conditions and to see if the survival outcomes fit with the literature on interdependent preferences and social norms. Helping behaviour is common and altruism or social and moral norms seem to play a central role in such a risky and extreme situation. For example, we observe that social norms such as "women and

children first" are surviving in such external shocks that create life and death situations. Such an effect is only observable if both, the crew and the passengers agreed to follow such norms. Otherwise, it would have been very easy for male passengers to revolt against such a norm. Actions are guided by norms and rationality in the sense that the society profits from a large amount of female and offsprings that survive. The social norms are strong enough to keep the "public good" problem of helping under control, limiting individual self-interested behaviour, although people also take advantage of their relative situation as can be seen by the higher survival rate of crew and first and second class passengers. Our findings clearly show the importance of working with Richard Thaler's notion of a Homo Sapiens to be able to understand individuals' behaviour in a life and death environment.

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Table 1: Survival Probability and Pro-Social Behaviour.

Probit	All (1)	Passenger (2)	Crew (3)	Couple (4)	Passenger (5)	All (6)	All (7)	Couples (8)	All (9)	All (10)	All (11)
FEMALE	1.413***	1.407***	1.858***	1.477***	1.428***	1.493***	1.488***	1.702***	1.517***	1.509***	1.512***
	20.22	*17.38*	*5.50*	*10.29*	*16.69*	*18.29*	*18.16*	*9.8*	*18.11*	*17.98*	*17.84*
	0.517	**0.511**	**0.237**	**0.539**	**0.516**	**0.542**	**0.541**	**0.605**	**0.550**	**0.547**	**0.548**
AGE Sub 15					0.829***	0.764***	0.758***		0.745***	0.745***	0.753***
					4.09	*3.94*	*3.89*		*3.76*	*3.75*	*3.77*
					0.320	**0.293**	**0.291**		**0.286**	**0.285**	**0.289**
AGE 16 - 50					0.468***	0.416***	0.445***		0.463***	0.462***	0.469***
					2.95	*2.84*	*3.01*		*3.11*	*3.10*	*3.14*
					0.157	**0.131**	**0.139**		**0.143**	**0.143**	**0.145**
CREW						0.536***	0.546***		0.493***	0.649***	0.631***
						6.51	*6.61*		*5.42*	*5.62*	5.37
						0.189	**0.193**		**0.174**	**0.229**	**0.223**
1st Class					1.140***	1.140***	1.122***	0.833***	1.194***	1.173***	1.136***
					10.51	*10.92*	*10.68*	*3.85*	*10.91*	*10.67*	*9.36*
					0.429	**0.429**	**0.422**	**0.320**	**0.448**	**0.440**	**0.427**
2nd Class					0.416***	0.407***	0.390***	1.577***	0.412***	0.481	0.454***
					3.99	*3.9*	*3.72*	*7.9*	*3.89*	*4.34*	*3.97*
					0.157	**0.150**	**0.144**	**0.569**	**0.153**	**0.179**	**0.169**
Has Child/ Children							0.523***	0.596***	0.713***	0.688	0.682***
							2.69	*2.77*	*3.39*	*3.26*	*3.22*
							0.199	**0.234**	**0.274**	**0.264**	**0.261**
Small Groups (Couples)									-0.274**	-0.254	-0.252***
									-2.47	*-2.28*	*-2.25*
									-0.090	**-0.084**	**-0.084**
Large Groups (Families)									-0.479	-0.033	-0.023
									-0.47	*-0.33*	*-0.22*
									-0.017	**-0.012**	**-0.008**
England (1143)										-0.201***	
										-2.20	
										-0.070	
Ireland (114)											0.140
											0.85
											0.050
Sweden (106)											0.068
											0.40
											0.024
USA (424)											0.236**
											2.18
											0.085
All Others (399)											0.206*
											1.89
											0.040
Obs.	2186	1258	886	376	1258	2186	2186	376	2186	2186	2186
Prob.>chi2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pseudo R2	0.161	0.196	0.041	0.221	0.268	0.209	0.212	0.389	0.214	0.216	0.216

Notes: z- values in italics, marginal effects in bold. The symbols *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table 2: Survival of Women

Probit	Passenger (12)	All (13)	All (14)	Couples (15)	All (16)	All (17)	All (18)
AGE Sub15	0.147	0.060	0.086	0.993	-0.011	-0.012	0.054
	0.61	*0.25*	*0.35*	*1.15*	*-0.04*	*-0.05*	*0.21*
	0.044	**0.017**	**0.023**	**0.089**	**-0.003**	**-0.003**	**0.015**
AGE 16 – 35	0.528***	0.421**	0.457**	0.272	0.473***	0.472***	0.425**
	2.85	*2.39*	*2.55*	*0.83*	*2.62*	*2.60*	*2.29*
	0.169	**0.125**	**0.132**	**0.048**	**0.135**	**0.135**	**0.121**
CREW Dummy		1.177***	1.22***		1.007***	1.014***	1.031***
		3.41	*3.54*		*2.81*	*2.64*	*2.66*
		0.200	**0.194**		**0.174**	**0.175**	**0.177**
1st Class	1.964***	2.001***	1.99***	2.899***	2.170***	2.168***	2.138***
	7.96	*8.45*	*8.21*	*6.04*	*8.74*	*8.69*	*7.89*
	0.415	**0.403**	**0.389**	**0.527**	**0.408**	**0.407**	**0.403**
2nd Class	1.131***	1.118***	1.111***	1.168***	1.202***	1.205***	1.188***
	6.40	*6.37*	*6.25*	*3.77*	*6.43*	*6.11*	*5.80*
	0.274	**0.241**	**0.231**	**0.136**	**0.240**	**0.241**	**0.238**
Has Child/Children			1.024**	1.45***	1.457***	1.456***	1.536***
			2.37	*2.98*	*3.18*	*3.17*	*3.16*
			0.186	**0.154**	**0.215**	**0.215**	**0.220**
Small Groups (Couples)					-0.661***	-0.660***	-0.623***
					-3.43	*-3.40*	*-3.18*
					-0.197	**-0.196**	**-0.185**
Large Groups (Families)					-0.167	-0.166	-0.154
					-0.95	*-0.94*	*-0.86*
					-0.047	**-0.047**	**-0.044**
England Dummy						-0.009	
						-0.05	
						-0.003	
Ireland							0.203
							0.76
							0.052
Sweden							-0.413
							-1.40
							-0.130
USA							0.016
							0.07
							0.0040
All Other Nations							0.045
							0.21
							0.012
Obs.	433	482	482	169	482	482	482
Prob.>chi2	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Pseudo R2	0.2198	0.2338	0.2466	0.4505	0.2683	0.2683	0.2761

Notes: z- values in italics, marginal effects in bold. The symbols *, **, *** represent statistical significance at the 10%, 5% and 1% levels, respectively.

Table A1: Mean Values

Variables	Mean
Survived	0.319
FEMALE	0.220
AGE Sub 15	0.052
AGE 16 - 50	0.891
CREW	0.405
1st Class	0.146
2nd Class	0.129
Has Kids	0.031
Small Groups (Couples)	0.171
Large Groups (Families)	0.167
England	0.529
Ireland	0.052
Sweden	0.048
USA	0.191
Other Nationalities	0.180
Female Age 16-35	0.589