Untangling Decision Routes in Moral Dilemmas: The Refugees' Dilemma

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Abstract

It is sometimes considered that there are two routes to moral choice, deontological and

utilitarian (with debate as to whether each of these routes uniquely reflect emotional vs.

analytic components). Yet in moral judgments we are often faced with a third route to choice,

based on rules imposed by an outside agency (most typically the legal framework of a

country). Whether we agree with these rules or not, we can choose to guide moral choice in

this way. Moreover, depending on the situation, we can sometimes choose to prioritize such

external rules or not. Sometimes external rules coincide with either deontological or utilitarian

biases. But what happens when they do not? Using a novel paradigm for moral judgment, the

The Refugees' Dilemma, we provide evidence for such a route to moral choice based on

external rules. We show in three experiments that participants with high scores in a Cognitive

Reflection Test or under Cognitive Load were more likely to adopt utilitarian or rule-based

responses, as opposed to emotional ones. We also found that rule-based respondents reported

the highest average Psychological Distance. These findings extend the predominant approach

of dual-process models.

Keywords: *Dual-Process Models; Ethics; Moral Judgment; Moral Psychology*

Introduction

Moral decision-making is a key issue for modern democracies. Therefore, understanding the principles underpinning moral judgment is fundamentally important. Consider the recent refugee crisis. The number of forcibly displaced people worldwide reached 59.5 million at the end of 2014, the highest level since World War II. Of these 59.5 million, 19.5 million were refugees, and 1.8 million were asylum-seekers. How do individuals in destination countries form opinions regarding refugees and asylum seekers? At the very least, understanding the influences shaping moral choice should provide individuals with better insight (and possibly control) into their ultimate determinations.

The established theory is that moral decisions are driven by two complementary influences. The original dual-process theory proposes that utilitarian responses, resulting from controlled cognitive processes, contrast with non-utilitarian responses (considered deontological) which are assumed to be driven by automatic/intuitive emotional responses (Greene et al., 2001; Greene & Haidt, 2002; Greene et al., 2004; Koenigs et al., 2007). Utilitarian/consequentialist judgments are aimed at maximizing benefits and minimizing costs across affected individuals (Mill, 1861/1998), while the deontological perspective emphasizes rights and duties (Kant, 1785/1959). Since then, considerable evidence has accumulated that the distinction between the two routes, conceptualized as above, is not clear cut, even if it is often a convenient starting point for further research to make some corresponding assumptions.

Consider deontological decisions. It seems there is a fundamental inconsistency in our current understanding of such decisions. On the one hand, they are meant to be based on some rule, principle or norm. On the other hand, the deontological route is meant to be automatic and rely on the emotional content of the situation. However, evaluating a decision in terms of consistency with a moral norm (since deontological decisions plausibly originate with moral

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norms) should be an analytic process, in the same way that consistency with any explicit rule/ principle in decision making is typically analytic (Posner & Snyder, 1975; Sloman, 1996; Kahneman, 2003).

There is a corresponding debate, with some researchers arguing that deontological decisions are a confabulation of moral emotions (Greene, 2007; Haidt, 2001) and others rejecting this assumption (Kahane, 2012; Kahane & Shackel, 2010; Mihailov, 2016). Furthermore, Korner and Volk (2014) showed recently, in contrast to prior work on moral judgments (which mostly links deontology to intuitive processing and utilitarianism to deliberation), that deontological judgments can result from at least two different mechanisms. They showed that participants made more deontological judgments under concrete-low (vs. abstract-high) mindsets when they were under time pressure and that this pattern reversed when participants had sufficient time, resulting in more deontological judgments under abstract-high (vs. concrete-low) mindsets. To understand the notions of concrete-low vs. concrete-high, we turn to Construal Level Theory (CLT), which argues that information can be processed abstractly or concretely according to its psychological distance. That is, people process objects or events that are psychologically distant (e.g., in time or space) in an abstract manner (abstract construal) – entailing schematic, decontextualized, detail-poor representations that capture superordinate, central features – whereas people process objects or events that are psychologically close in a concrete manner (concrete construal) – entailing contextualized, detail rich representations that capture subordinate, incidental features (for reviews see Trope & Liberman, 2003, 2010).

Recent neuroimaging findings have suggested that employing deontological rules selectively engages regions of the brain associated with semantic rule retrieval (the left temporoparietal junction and ventrolateral prefrontal cortex; Berns et al., 2012), consistent with the retrieval and processing of specific (moral) principles rather than any enhanced

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emotional reactions. Further corroborating this view, Gamez-Djokic and Molden (2016) demonstrated that in dilemmas involving violations of moral standards for the greater good, deontological judgments may also arise through non-affective routes when people are motivated by prevention. Regarding utilitarian decisions, the predominant view of assuming that they are supported by an analytic route has been challenged by results showing that emotional arousal can in some circumstances produce a bias for utilitarian decisions, not deontological ones (Francis et al., 2016, 2017; Patil, Cogoni, Zangrando, Chittaro, & Silani, 2014). Finally, dual process theorists have long argued that processes that initially require deliberation can be automatized with practice and repeated exposure. Some studies show that utilitarian responses can be generated intuitively (e.g., Bago & De Neys, 2019; Baron & Gürçay, 2016). Automatization is yet another factor which prevents a sharp distinction concerning the processes supporting deontological vs. utilitarian choices, and we further consider it below.

Overall, the present literature provides a confusing picture regarding the cognitive processes supporting moral choice. We think part of the problem is that both the theoretical formulation and the corresponding experimental paradigms (sacrificial scenarios that we will introduce below) have been squarely focussed on a contrast between ostensibly deontological and utilitarian choices, in the absence of rule-based choices where the rule has no direct emotional or moral content (i.e., cold rules; henceforth, for brevity rule-based will refer to such rules). A rule-based route to moral choice would involve a requirement for consistency with some framework external to the decision maker, usually legal, but not necessarily so rules. Such external rules may sometimes also be deontological or they may also be utilitarian. Additionally, in some cases there will be no choice but to behave in a way consistently with external rules (e.g., because the penalties for non-compliance are too harsh) regardless of consistency with any personal utilitarian or deontological rules. However,

assuming non-compliance penalties are not too severe, it should be in principle possible to disentangle rule-based moral choices, from deontological or utilitarian ones.

A putative rule-based route to moral judgement has been largely ignored in modern approaches to moral psychology, but we think it is important. First, theoretically, it appears that, perhaps depending on circumstances, both the utilitarian and the deontological routes to moral choice can involve predominantly either emotional or analytic processes. This inconsistency may be partly due to the fact that the commonly employed situations to contrast between a deontological choice and a utilitarian one are incomplete, as it is frequently the case in real life that moral choices also have to incorporate the requirements from external rules. Deciding (or not) to act in a way consistently with external rules would be expected to be an analytic process, which in turn may systematically affect whether deontological vs. utilitarian choices are approached analytically or not. That is, the inclusion of a rule-based route to choice in moral dilemmas may provide a cleaner distinction between deontological and utilitarian routes and increase the effectiveness of existing dissociation methods (e.g., Conway & Gawronski, 2013; Gawronski et al., 2017). Second, it seems clear that in some cases utilitarian and/or deontological and/or external rule-based biases to moral choice would overlap even if, in principle, all these influences to moral choice are independent.

However, it is an empirical question how external rules, without *direct* appeal to deontology or utilitarianism, are interpreted by participants. If the external rule is a legal one, perhaps participants ascribe deontological or utilitarian properties to such external rules, even if the deontological justification is unclear (perhaps by assuming that legal rules generally trace their origins to the constitution of a country, which is in itself deontological or utilitarian). That is, it is possible that external rules do not have an influence on moral choice distinct from deontological vs. utilitarian ones. Finally, from a practical point of view, the focus on just a deontological vs. utilitarian contrast has led to experimental moral decision

paradigms that we think can be considered as contrived by participants and reduce realistic engagement of moral judgment processes. The inclusion of a rule-based moral choice rule should lead to moral dilemmas closer to everyday life.

We propose progress in the debate regarding the foundations of moral choice by employing a novel lab-based moral dilemma that we call the Refugees' Dilemma (Barque-Duran & Pothos, 2017). The Refugees' Dilemma has been developed to include three routes to moral choice. First, there is a utilitarian route, driven by a prerogative to benefit as many individuals as possible. Second, there is an emotional route, which we suggest broadly aligns with the traditional notion of deontology, since a feeling/ intuition that a particular moral choice is appropriate is often routed in deontological reasons. Third, there is a route based on an external, legal, cold rule. This route is about consistency with a relevant legal framework of a hypothetical country; no direct justification for the rule is provided and the penalties for non-compliance are presented as moderate, not harsh. Each route to moral choice was associated with a distinct decision and participants would have to make an exclusive choice.

We suggest that the Refugees' Dilemma has advantages over the traditional, sacrificial moral dilemmas, which have been common in research on moral judmgents. The dominant experimental paradigm of this kind has been the Trolley dilemma, whereby, in one version, participants have to either let an out of control train kill several individuals or push a fat man in front of the train, saving the individuals, but killing the man (Thomson, 1985). However, the situations depicted in the Trolley dilemma (and analogous ones) are arguably very hypothetical; under what circumstances can a participant in this type of dilemmas be informed by his/her world knowledge and experience to provide meaningful responses? Note, Kahane et al. (2014) showed that there is very little relation between sacrificial judgments in the hypothetical dilemmas that dominate current research, and utilitarian approaches to ethics.

By contrast, a moral scenario based on refugees will resonate with many participants,

who may already have strong preconceptions about the moral aspect of corresponding questions. Additionally, the Trolley dilemma and other sacrificial dilemmas have no room for moral choices based on cold rules, since the non-utilitarian option (not to push the fat man) is perfectly aligned with the emotional choice. As argued, we think it is important to consider the interplay not just between putative deontological and utilitarian influence, but also rule-based ones, and the Refugees' Dilemma is flexible enough to accommodate moral choices based on different routes.

In moving towards an experimental moral choice paradigm closer to everyday life moral choices, a key question is whether participants may have such strong, pre-existing biases regarding the hypothetical situations that are depicted, that these biases overwhelm any experimental manipulation. This is a possibility and it is an experimental question whether the Refugees' Dilemma can produce distinctive response patterns, over and above individual variation. Note, we attempted to bring under direct experimental control an important relevant bias, the in-group bias, and so consider the robustness of any conclusions regarding moral choice. The in-group bias is the observation that, across a variety of scenarios, people tend to be more helpful to members of their own group rather than to those of other groups (Fowler and Kam, 2007; Yamagishi et al., 1999; Tajfel et al., 1971). With a dilemma like the present one, it is possible that the in-group bias might overwhelm any other preferences for one moral route, as opposed to another. So, we included manipulations that explore how the in-group bias impacts on the relative influence of the different routes to moral decision-making we postulate.

The questions, therefore, driving the present research can be summarized as follows: is there a route to moral choice based on cold, external rules, that is distinct to the utilitarian and deontological ones and what are the characteristics of this putative route? Is the Refugees' Dilemma an appropriate paradigm for distinguishing different routes to moral choice and does

it lead to robust results? Does the inclusion of an option based on cold rules in a moral dilemma help disambiguate our understanding of the processes supporting moral choice?

To make progress towards resolving these questions, we utilized a range of questionnaire tools and manipulations. First, we measured psychological distance. Our working hypothesis is that participants making rule-based or utilitarian decisions will evaluate a situation with greater psychological distance and conversely regarding emotional decisions. Psychological distance weakens the intensity of people's affective reactions, such as feelings of empathy (Williams et al., 2014). Furthermore, increasing psychological distance leads individuals to construe situations in more abstract terms, which sometimes aligns with more utilitarian decision-making (Trope & Liberman, 2010) and, we hypothesize, with more rule-driven decisions too, though it is a priori unclear whether utilitarian or rule-based decisions will be associated with greater distance. An alternative possibility is that participants may ascribe content to an external rule over and above the information directly provided, e.g., a legal rule may be perceived as deontological in the way the constitution of a country is deontological.

Second, we tested participants on the Cognitive Reflection Test (CRT; Frederic, 2005; Toplak et al. 2014; Thomson and Oppenheimer, 2016), which distinguishes two modes of cognitive processing, one that is more reflective and slow versus one that is more immediate with little conscious deliberation (Kahneman, 2003). Differences in the CRT could inform a propensity to adopt utilitarian vs. rule-based vs. emotional decision making, as long as some routes to moral choices are more analytic (and so presumably rely more on reflective cognition) than others. We have already seen that these questions have led to a lot of inconsistency in the literature (e.g., Korner and Volk, 2014). However, rule-based moral choices would be expected to be more analytic than either emotional ones or utilitarian ones, since a person needs to consider the applicability of a rule and the consequences of violating

it. The inclusion of the CRT partly aims to test this hypothesis. Additionally, as argued, it is possible that the inclusion of the rule-based rule will increase consistency in the cognitive processes supporting the other two routes for moral choice.

A highly influential approach in decision-making concerns the two-system approach (cf. the "default interventionist" theory, Evans, 2007), which holds that many cognitive tasks involve a fast, intuitive, process, followed sometimes by a slower and more reflective process that often corrects errors resulting from the intuitive process (Kahneman, 2011). Furthermore, as stated before, processes that initially require deliberation in the dual process theories can be automatized with practice and repeated exposure and even some utilitarian responses can be generated intuitively (e.g., Bago & De Neys, 2019; Baron & Gürçay, 2016). It is possible that, amongst the three postulated routes to moral decision-making, some are more aligned with a fast cognitive processing mode and others with a slow cognitive processing mode. We employed a manipulation which might reveal such differences: a cognitive load manipulation aimed at testing more directly if rule-based judgments vs. utilitarian vs. emotion-based judgments exactly reflect a distinction between more thoughtful vs. more intuitive/ automatic judgments.

Finally, partly for exploratory purposes, we included some measures which might indirectly corroborate a view of non-equivalence between a rule-based route and ones driven by emotion or utilitarianism. We explored whether a bias to prefer a particular route to moral choice might depend on religion affiliation and/ or political attitudes. For example, people are more likely to become politically engaged (e.g., vote, engage in activism) when issues are associated with strong moral convictions (Skitka et al., 2016). Concerning the present research objectives, non-identity between response patterns across individuals preferring particular routes to moral choice would support a conclusion of non-identity of the routes themselves.

Experiment 1

The primary objective was to explore whether it is possible to discriminate between moral decisions based on the emotional content of a situation (emotional decisions), decisions driven by a prerogative of consistency with a cold rule (rule-based decisions), and decisions based on utilitarian considerations using a novel lab-based moral dilemma, that we call the Refugees' Dilemma. Specifically, we explore the hypotheses that rule-driven decisions are aligned with an increase in psychological distance and that high CRT participants are more likely to opt for the rule-based response than low CRT participants. We also measured religious and political beliefs.

Method

Participants

A total of 355 participants, all of whom were US residents, were recruited online and received \$0.80 (168 women, 178 men; *M* age = 37.7 years, *SD* = 11.9). For this and the rest of experiments, the City, University of London Psychology Department Research Ethics Committee granted approval for this project (reference PSYETH (S/L) 15/16 238). In this and other experiments sample sizes were fixed a priori, either based on power analyses based on early work (see Experiment 2a) or exploratory considerations. In this case, an a priori power analysis was conducted using G*Power3 (Faul, Erdfelder, Lang, & Buchner, 2007) with an effect size (f= .22), and an alpha of .05. Result showed that a total sample of 306 participants was required to achieve a power of .95 using a one-way ANOVA.

Materials and Procedure

The study was designed in Qualtrics, run on Amazon Mechanical Turk and lasted approximately 10 minutes. We used frequency of Type of Judgment (Utilitarian vs. Emotional vs. Rule-based) as the dependent measure. We used the scores from the CRT (Toplak et al. 2014; Thomson and Oppenheimer, 2016) to measure deliberate (high CRT scores) vs. intuitive (low CRT scores) cognitive processes and measured the basis of participants' judgments and psychological distance.

After a few preliminary screens (consent form; some basic demographic information), all participants were presented with The Refugees' Dilemma (full text in Supplementary Material). They were instructed to read it carefully and had to spend at least 60 seconds reading it before the experiment advanced. The Refugees' Dilemma requires a participant to imagine himself/herself as a security guard in a border control of a hypothetical country, which neighbors four other countries. Participants were told they have to make one last decision before borders close (until further notice) and that were instructions that entry into their country will be allowed from just one other country.

Then, participants were presented with a quiz to ensure that they had been paying attention during the previous screen. Three basic multiple-choice questions regarding The Refugees' Dilemma were presented (e.g., "As a security guard, what is the name of your country?). Feedback was provided and participants had to keep responding until no mistakes were made.

Subsequently, the three moral options were presented (Utilitarian: where ten refugees from another country need help; Emotional: where a refugee orphan child from another country needs medical attention immediately; and Rule-based: where a traveller wants to go back home, travelling via the participant's country, and the law specifies that travellers have to take priority when returning home). Note that in this version of the Refugees Dilemma, no choice benefits from an in-group bias (the potentially moderating influence of an in-group

bias is explored in subsequent experiments). The text for each scenario was supplemented with an illustration (Figure 1). The moral choice was then presented to participants: "Who do you allow to your country? Remember, you can only allow traveller(s) from one neighbouring country". Participants had to choose between Choice 1 (Utilitarian; "The 10 refugees from Beta"), Choice 2 (Emotional; "The refugee orphan child from Gamma"), or Choice 3 (Rule-based; "The traveller coming from Delta and travelling back home to Epsilon"). Regarding consequences for non-compliance with the rule, participants were simply told "You do not know what these consequences will be, but they may include losing your job" (in all experiments, non-compliance consequences were stated in the same way). Note, the participant's country was called Alpha.

<INSERT FIGURE 1 HERE>

Figure 1. Illustrations and choices used in The Refugees' Dilemma for Experiment 1 (1a: Utilitarian (judgment driven by consequences/ outcomes)) vs. (2a: Emotional (judgment driven by emotions)) vs. (3a: Rule-based (judgment driven by a rule, principle or norm)).

There are various methods assumptions and qualifications that need to be considered. First, rule-based route to moral choice was not supplemented with any direct information regarding a utilitarian or deontological justification. Thus, we think it is valid to assume that the presented rule is cold. We noted the possibility that participants convert the requirement of consistency with a legal rule to a deontological consideration (one of moral obligation to obey the legal rules of a country). Whether this happens or not is part of the experimental hypotheses and to be assessed by the extent of non-identity of the measured characteristics for the rule-based route vs. the other ones. Second, there was some information regarding the consequences of non-compliance with the rule and we tried to strike a balance between the consequences appearing trivial and harsh to the point of excluding any other courses of

action. Finally, we suggest that the emotional route is a deontological one, consistent with a broader principle of prioritizing the welfare of children. We readily accept that the possible deontological status of this choice would not be uniformly shared by participants, nevertheless whether this happens or not is not directly relevant to the present objectives: we are interested in an emotional route to moral choice and the present manipulation is a priori a reasonable approach to address this requirement.

Participants were next asked to complete a 4-items questionnaire (see Supplementary Material), which was intended as a measure of the basis of participants' judgments (e.g., "How much would you say that *doing the greater good for the greatest number of people/ emotion/ a principle, norm or rule* was the basis for your decision?"). The order of these three questions was presented randomly and participants had to respond moving a slider that went from 0 (not at all) to 7 (the high anchor of the rating scale was explained in different ways for each question, as *doing the greater good for the greatest number of people/ emotion/ a principle, norm or rule*). The fourth item of the questionnaire, following the same format, was a measure of psychological distance (Trope & Liberman, 2010) ("How distant do you feel yourself from the scenario when making your decision?").

Participants were next presented with three "catch questions", to control for attention and basic comprehension during the task (e.g., "How many refugees there were in the group from Beta?").

Then, participants had to complete the CRT (Toplak et al. 2014; Thomson and Oppenheimer, 2016), to distinguish participants in terms of two modes of cognitive processing, quick with little conscious deliberation versus slower and more reflective. The test consisted of eight multiple-choice questions (e.g., "A man buys a pig for $60, sells it for $70, buys it back for $80, and sells it finally for $90. How much has he made?"). Note, there have been concerns regarding the sensitivity of the CRT, given evidence that participants in

Amazon Mechanical Turk become familiar with particular CRT tests very quickly (Chandler et al., 2014; but see Bialek and Pennycook, 2017, showing its robustness after multiple exposures).

Finally, participants were asked to complete demographic questions regarding their levels of Religiosity (using a 7-point Likert scale) and Political Views (Liberal, Moderate, Conservative or Something else).

Results

Validation of the Experimental Paradigm

We excluded those participants who did not answer the catch questions correctly (35/355). No other sample trimming was conducted.

We first discuss results which aim to validate the assumptions in the design of The Refugees' Dilemma. We tested if the three different choices presented in the dilemma (Choice 1, Utilitarian, "The 10 refugees from Beta"; Choice 2, Emotional, "The refugee orphan child from Gamma"; or Choice 3, Rule-based, "The traveller coming from Delta and travelling back home to Epsilon") were indeed aligned with doing the greater good for the greatest number of people, with emotion or with a rule, as assumed. As expected, participants making the utilitarian choice reported that their decision was mainly based on doing the greater good for the greatest number of people ($M = 5.8$, $SD = 1.4$). Participants making the emotional choice reported that their decision was mainly based on emotions ($M = 5.6$, $SD = 1.3$). Finally, participants making the rule-based choice reported that their decision was mainly based indeed on a rule, principle or norm ($M = 6.1$, $SD = 1.5$). One-way ANOVAs for each group of participants were all significant: $F(2,319) = 150.38$, $p < .001$, $w^2 = .48$ for the utilitarian respondents; $F(2,319) = 295.91$, $p < .001$, $w^2 = .65$ for the emotional respondents; $F(2,319) = 62.38$, $p < .001$, $w^2 = .28$ for the rule-based respondents. A Tukey post-hoc test for

each group revealed significant differences in the expected directions ($p < .001$). These results are all consistent with expectation regarding the assumptions motivating the three options in The Refugees' Dilemma.

High vs. Low Cognitive Resources, Psychological Distance and Time

We first considered whether results from the CRT influence moral choice. We report the CRT scores from participants using a combined CRT measure with an 8-point scale from Toplak et al. (2014) and Thomson and Oppenheimer (2016). There were slight trends in the expected direction. Participants with the lowest CRT scores were more likely to opt for the emotional response ($M = 4.3$, $SD = 2.1$), than for the utilitarian and rule-based options. Similar CRT scores were observed for participants choosing the utilitarian and rule-based responses ($M = 4.6$, $SD = 1.9$; $M = 4.6$, $SD = 2.0$, respectively), indicating that rule-based moral choices require a similar route to utilitarian ones. However, a one-way between subjects ANOVA for these means was not significant, $F(2, 317) = 0.341$, $p = .71$, $w^2 = .002$.

We next examined whether different moral changes reflected the expected differences regarding Psychological Distance. Participants opting for the rule-based option reported the highest distance ($M = 3.9$, $SD = 2.2$), followed by participants making the utilitarian selection ($M = 2.9$, $SD = 1.8$), and finally the ones selecting the emotional answer ($M = 2.8$, $SD = 1.9$). It is interesting that participants making the rule-based choice reported the highest distance, perhaps because the application of a rule to the dilemma requires a degree of detachment from the specifics of the situation more so than even for utilitarian respondents. A one-way between subjects ANOVA for these means was significant, $F(2, 319) = 12.419$, $p < .001$, $w^2 = .073$. A Tukey post-hoc test revealed that psychological distance was significantly different between participants making the utilitarian and the rule-based selection ($p = .007$) and between participants making the emotional and rule-based selection ($p < .001$). There were no

statistically significant differences between the utilitarian and emotional groups ($p = .944$).

These results clearly support the proposal for a cold, rule-based route to moral decision

making, distinct from utilitarian and emotional influences.

Political Views and Religiosity

These results are exploratory, though, as argued, non-identity between data patterns

corresponding to each of the postulated routes to moral choice indirectly supports a position

of distinctiveness of these routes; this turned out to be the case. We first explored the

differences in moral choice, depending on participants' stated Political Views. Liberals were

more likely to opt for the utilitarian response (20.13%) compared to Conservatives (9.3%) and

Moderates (7.4%). Liberals were also more likely to opt for the emotional answer (45.6%)

compared to Moderates (40.3%) and Conservatives (31.9%). Interestingly, Conservatives

were more likely to opt for the rule-driven judgment (58.76%) compared to Moderates

(52.2%) and Liberals (34.2%). A corresponding 3x3 chi-square test of independence was

highly significant, $\chi2$ (4, N=313) = 37.62, $p < .001$. We also ran a 3x2 chi-square test of

independence on Political Views (Liberals vs. Conservatives vs. Moderates) against

participants' levels of Psychological Distance (High vs. Low) to explore if Liberals tend to

involve themselves more closely in the situation, which could explain some degree of their

route preferences. Unfortunately, the test was not significant, $\chi2$ (2, N=368) = 0.36, $p = .83$.

Regarding religiosity, we selected only participants who reported Low vs. High levels

of religiosity (1 or 2 out of 7 points vs. 5, 6 or 7 for the Low vs. High analysis, respectively,

noting that eliminating middle points in a distribution alleviates issues with dichotomization,

MacCallum et al., 2002). Low-Religious participants were more likely to opt for the

utilitarian response (16.4%) compared to High-Religious ones (12.1%). Low-Religious

participants were more likely to opt for the emotional answer (43.2%) compared to High-

Religious ones (37.36%). Finally, High-Religious participants were more likely to opt for the rule-driven judgment (50.5%) compared to Low-Religious ones (40.4%). However, there was no overall interaction and the corresponding 3x2 chi-square test of independence on Type of Judgment (Utilitarian vs. Emotional vs. Rule-based) against participants' levels of Religiosity (Low vs. High) was not significant, $F<1$.

Experiment 2a

In Experiment 1, the decision consistent with the rule concerned a traveller who is going back home, to a country other than the participant's (hypothetical) own country. In a moral dilemma as the present one, the in-group bias is an important aspect of realism (Tajfel et al., 1971; Yamagishi et al., 1999; Fowler and Kam, 2007), perhaps so important so as to overwhelm other possible biases (as possibly arising from different routes to moral-decision making). To explore this possibility, we developed a version of the task which incorporated the in-group bias, by aligning it with the rule-based response (i.e. by making the decision consistent with the rule about a traveller who is from the participant's hypothetical own country). Note, a methodological advantage of this procedure was that it simplified the scenario, since in Experiment 1, eschewing the in-group bias required to create a complicated reasoning for a passing-through traveller.

Method

Participants

A total of 1508 participants, all of whom were US residents, were recruited on-line and received $0.80 for doing the task (706 women, 801 men; *M* age = 34.6 years, *SD* = 11.17). Note, the high sample size in this experiment was due to the fact that historically this was the first experiment, even though logically it follows a first demonstration without the in-

group bias. Following this experiment, power analyses (based on some of the key effects) guided reduced population sample sizes in Experiment 1 and the other experiments.

Materials and Procedure

The study was designed in Qualtrics, run on Amazon Mechanical Turk and lasted 10 minutes approximately. We used frequency of Type of Judgment (Utilitarian vs. Emotional vs. Rule-based) as the dependent measure. We used the scores from the CRT (Frederic, 2005) to measure thoughtful (high CRT scores) vs. unreflective (low CRT scores) cognitive processes.

We followed similar procedures as in Experiment 1 (consent form, basic demographic information, reinforcement learning task, attentional questions). All participants were also presented with a new version of The Refugees' Dilemma (full text in Supplementary Material), which was based on the previous one but designed to introduce the in-group bias in the rule-based choice. Therefore, we changed the rule from Experiment 1 (which specified that the law is that travellers who are returning to their country of residence, regardless of where they have been travelling, have to take priority) to a new one (which specified that the traveller is from the participant's country and that travellers who are citizens from the participant's own (hypothetical) country have to take priority when returning). In other words, the new law favoured returning travellers from the participant's own country (see Figure 2). The new options were Utilitarian: where ten refugees from another country need help; Emotional: where a refugee orphan child from another country needs medical attention immediately; and Rule-based: where a traveller from the participant's own country wants to go back home and the law the participant has to abide by specifies that travellers who are citizens from his/her own country have to take priority when returning. Participants had to choose between Choice 1 (Utilitarian; "The 10 refugees from Beta"), Choice 2 (Emotional;

"The refugee orphan child from Gamma"), or Choice 3 (Rule-based; "The traveller who is an Alpha citizen coming from Delta").

Participants were first presented with the new version of The Refugee's Dilemma. Then, they were asked to complete the same 4-items questionnaire as in Experiment 1 (see Supplementary Material), which served as a measure of the basis of participants' judgments and psychological distance. After answering the 4-items questionnaire again, participants also had to complete a CRT (Frederic, 2005), as a measure of two modes of cognitive processing, and some questions regarding their levels of Religiosity and Political Views as in Experiment 1.

<INSERT FIGURE 2 HERE>

Figure 2. Illustrations and choices used in The Refugee's Dilemma for Experiment 2a (on the left) and Experiment 2b (on the right). While in Experiment 2a there was an in-group bias in the rule-based choice, in Experiment 2b there was an in-group bias in the utilitarian choice. The choices could be summarized as follows: Utilitarian – judgment driven by consequences/ outcomes (1a and 1b) vs. Emotional – judgment driven by emotions (2a and 2b) vs. Rule-based – judgment driven by a rule, principle or norm (3a and 3b).

Results

Validation of the Experimental Paradigm

We excluded those participants who did not answer the catch questions correctly (92/1508). No other sample trimming was conducted.

We first discuss results which help validate the assumptions in the design of the Refugees' Dilemma. We tested if the three different choices presented in the dilemma (Choice 1, Utilitarian, "The 10 refugees from Beta"; Choice 2, Emotional, "The refugee orphan child

from Gamma"; and Choice 3, Rule-based, "The traveller who is an Alpha citizen coming from Delta") were indeed aligned with doing the greater good for the greatest number of people, with emotion or with a rule, as assumed (see Figure 3, left panel). As expected, participants making the utilitarian choice reported that their decision was mainly based on doing the greater good for the greatest number of people ($M = 6$, $SD = 1.3$). Participants making the emotional choice reported that their decision was mainly based on emotions ($M = 5.7$, $SD = 1.4$). Finally, participants making the rule-based choice reported that their decision was mainly based indeed on a rule, principle or norm ($M = 6$, $SD = 1.5$). One-way ANOVAs for each group of participants were all significant: $F(2,308) = 56.93$, $p < .001$, $w^2 = .27$ for the utilitarian respondents; $F(2,1226) = 337.787$, $p < .001$, $w^2 = .35$ for the emotional respondents; $F(2,2708) = 2511.996$, $p < .001$, $w^2 = .65$ for the rule-based respondents. A Tukey post-hoc test for each group revealed significant differences in the expected directions ($p < .001$). These results are all consistent with expectation regarding the assumptions motivating the three options in The Refugees' Dilemma.

Regarding the in-group bias, predictably the percentage of rule-based responses increased from 45.31% in Experiment 1 to 63.84% in Experiment 2a. We consider the role of the in-group bias in more detail after Experiment 2b.

<INSERT FIGURE 3 HERE>

Figure 3. Mean scores for the basis of judgments, for participants making the utilitarian, emotional, or rule-based choice in Experiment 2a and 2b. Error bars represent standard errors.

$***p < .001$.

High vs. Low Cognitive Resources and Psychological Distance

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We first considered whether results from the CRT influence moral choice. In Figure 4 (left panel) we report the CRT scores from participants using a CRT measure with 3-point scale from Frederic (2005). As expected, participants with the lowest CRT scores were more likely to opt for the emotional response ($M = 1.3$, $SD = 1.2$), than for the utilitarian and rule-based options. Similar CRT scores were observed for participants choosing the utilitarian and rule-based responses ($M = 1.7$, $SD = 1.2$; $M = 1.7$, $SD = 1.2$, respectively). A one-way between subjects ANOVA for these means was significant, $F(2, 1414) = 11.907$, $p < .001$. A Tukey post-hoc test revealed that CRT scores were significantly different between participants making the emotional and the utilitarian selection ($p = .020$) and between participants making the emotional and rule-based selection ($p < .001$). There were no statistically significant differences between the utilitarian and the rule-based groups ($p = .993$). These results support the proposal that the rule-based and utilitarian routes to moral choice are supported by analytic processes more so than the emotional one, as commonly assumed (Kahneman, 2011; and so more likely to be adopted by low CRT participants).

Why did we not observe this pattern in Experiment 1, where there was no difference in CRT between rule-based, utilitarian, and emotional routes to moral choice? Note, there is a large difference in sample size between the two experiments, raising concerns that in Experiment 1 we could not simply detect a difference. However, the effect sizes argue against this possibility. As we mentioned before, the high sample size in Experiment 2a was due to the fact that historically this was the first experiment. We offer two possibilities. First, across Experiments 1 and 2a we employed different CRT measures and it is possible that the one in Experiment 1 is less sensitive than that in Experiment 2a. Second, this version of the Refugees Dilemma was less complicated simply because the travelling arrangements of the refugees are easier. This may have encouraged reflexive thinking. For example, Oppenheimer et al. (2017) argued that easier vs. harder questions in a reasoning task were associated with

greater tendencies for reflexive vs. analytic thinking; in the Refugees' Dilemma, reflexive

thinking would be more likely to be emotional, consistent with evidence in moral decision

making in general (Greene et al., 2001; Greene & Haidt, 2002; Greene et al., 2004; Koenigs et

al., 2007). Overall, it is possible that there are contextual influences that can alter the default

thinking style associated with a moral choice route (cf. Francis et al., 2016, 2017; Patil et al.,

2014), but the present results cannot provide a full picture for this complicated question.

<INSERT FIGURE 4 HERE>

Figure 4. Mean scores for CRT scores between the different moral choices presented in

Experiment 2a and 2b. Error bars represent standard errors. ***p <.001; *p <.05.

We next examined whether different moral choices reflected the expected differences

regarding Psychological Distance (see Figure 5, left panel). Participants opting for the rule-

based option reported the highest distance ($M = 3.77$, $SD = 2.1$), followed by participants

making the utilitarian selection ($M = 3.18$, $SD = 2.1$), and finally the ones selecting the

emotional answer ($M = 2.71$, $SD = 1.93$). As in Experiment 1, participants making the rule-

based choice reported the highest distance. A one-way between subjects ANOVA for these

means was significant, $F(2, 1414) = 38.233$, $p < .001$, $w^2 = .05$. A Tukey post-hoc test

revealed that psychological distance was significantly different between participants making

the utilitarian and the rule-based selection ($p = .018$) and between participants making the

emotional and rule-based selection ($p < .001$). There were no statistically significant

differences between the utilitarian and emotional groups ($p = .089$). Overall, the pattern of

results is consistent with a conclusion of undeniably greater psychology distance for

participants preferring the rule-based choice and undeniably lower distance for ones adopting

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the emotional one; the utilitarian choice was associated with intermediate psychological

distance (cf. Francis et al., 2016, 2017; Patil et al., 2014).

<INSERT FIGURE 5 HERE>

Figure 5. Mean scores for psychological distance between the different moral choices

presented in Experiment 2a and 2b. Error bars represent standard errors. ***$p < .001$; *$p < .05$.

Political Views and Religiosity

We first explored the differences in moral choice, depending on participants' stated Political

Views (Figure 6, left panel). Liberals were more likely to opt for the utilitarian response

(10.11%) compared to Moderates (5.3%) and Conservatives (3.9%). Liberals were also more

likely to opt for the emotional answer (33.23%) compared to Moderates (28.53%) and

Conservatives (21.19%). Interestingly, Conservatives were more likely to opt for the rule-

driven judgment (74.93%) compared to Liberals (56.67%) and Moderates (66.13%). A

corresponding 3x3 chi-square test of independence was highly significant, $\chi2$ (4, N=1363) =

37.62, $p < .001$. Individual 3x2 chi-square tests for each category of respondents (utilitarian,

emotional, rule-based) were also significant, $\chi2$ (2, N=1363) = 15.61, $p < .001$; $\chi2$ (2,

N=1363) = 15.64, $p < .001$; $\chi2$ (2, N=1363) = 33.23, $p < .001$; respectively. We also ran a 3x2

chi-square test of independence on Political Views (Liberals vs. Conservatives vs. Moderates)

against participants' levels of Psychological Distance (High vs. Low). The test was not

significant, $\chi2$ (2, N=1364) = .031, $p = .98$.

Regarding religiosity, we selected only participants who reported Low vs. High levels

of religiosity (as only 8 out of 1416 participants reported 5 or more points in the 7 point

Likert scale of religiosity, we selected those with 1/7 points vs. 3/7 for the Low vs. High

analysis, respectively; Figure 6, left panel). Low-Religious participants were more likely to opt for the utilitarian response (8.1%) compared to High-Religious ones (6.32%). High-Religious participants were more likely to opt for the emotional answer (31.04%) compared to Low-Religious ones (25.6%). Finally, Low-Religious participants were more likely to opt for the rule-driven judgment (66.35%) compared to High-Religious ones (62.64%). A 3x2 chi-square test of independence on Type of Judgment (Utilitarian vs. Emotional vs. Rule-based) against participants' levels of Religiosity (Low vs. High) was significant $\chi2$ (2, N=994) = 15.36, $p < .001$. As for Experiment 1, participants favouring the rule-based vs. emotional vs. utilitarian routes display different patterns regarding political views and religiosity.

<INSERT FIGURE 6 HERE>

Figure 6. Percentage of Utilitarian, Emotional and Rule-based responses for participants' Political Views (Liberal vs. Moderate vs. Conservative) and participants' levels of Religiosity (Low vs. High) in Experiment 2a and 2b. Error bars represent standard errors.

Experiment 2b

In Experiment 2a, the decision consistent with the rule concerned travellers from the participant's (hypothetical) own country, and the corresponding choice was substantially favoured by participants. To understand whether the importance of the in-group bias is high enough to potentially overwhelm biases relating to emotional vs. utilitarian vs. rule-based preferences in moral choice, in Experiment 2b, we varied the alignment between the in-group bias and the moral choice, so that the in-group bias coincided with the utilitarian choice.

Method

Participants

A total of 353 participants, all of whom were US residents, were recruited on-line and received $0.80 for doing the task (176 women, 177 men; *M* age = 35.5 years, *SD* = 11.5).

Materials and Procedure

The study was designed in Qualtrics, run on Amazon Mechanical Turk and lasted 10 minutes approximately. We used frequency of Type of Judgment (Utilitarian vs. Emotional vs. Rule-based) as the dependent measure. We used the scores from the CRT (Frederic, 2005) to measure thoughtful (high CRT scores) vs. unreflective (low CRT scores) cognitive processes.

We followed similar procedures as in Experiment 1 and 2a (consent form, basic demographic information, reinforcement learning task, attentional questions). All participants were also presented with a new version of The Refugees' Dilemma (full text in Supplementary Material), which was based on the previous one but designed to align in-group bias with utilitarian choice and disentangle it from rule-following. The new options were Utilitarian: where ten travellers from the participant's own country want to go back home; Emotional: where a refugee orphan child from another country needs medical attention immediately; and Rule-based: where a refugee from another country needs help and the law from your country specifies that refugees who are citizens from that specific country have to take priority. Participants had to choose between Choice 1 (Utilitarian; "The 10 travellers who are Alpha citizens coming from Delta"), Choice 2 (Emotional; "The refugee orphan child from Gamma"), or Choice 3 (Rule-based; "The refugee from Beta").

Participants were first presented with the new version of The Refugee's Dilemma. Then, they were asked to complete the same 4-items questionnaire as in Experiment 1 and 2a (see Supplementary Material), to measure the basis of participants' judgments and

psychological distance. Subsequently, participants were presented with a screen alerting them that the law had changed before being presented with the Refugee's Dilemma from Experiment 2a (Note, that we are aiming at collecting repeated measures data in order to compare between the framings within participants). After answering the 4-items questionnaire again, participants also had to complete a CRT (Frederic, 2005), as a measure of two modes of cognitive processing, and some questions regarding their levels of Religiosity and Political Views as in Experiment 1 and 2a.

Results

Validation of the Experimental Paradigm

We excluded those participants who did not answer the catch questions correctly (58/354). No other sample trimming was conducted.

We first discuss results concerning the assumptions in the design of the new version of The Refugees' Dilemma. We tested if the three different choices presented in the dilemma (Choice 1, Utilitarian, "The 10 travellers who are Alpha citizens coming from Delta"; Choice 2, Emotional, "The refugee orphan child from Gamma"; and Choice 3, Rule-based, "The refugee from Beta") were indeed aligned with doing the greater good for the greatest number of people, with emotion or with a rule, as assumed (see Figure 3, right panel). As expected, participants making the utilitarian choice reported that their decision was mainly based on doing the greater good for the greatest number of people ($M = 4.8$, $SD = 2.2$). Participants making the emotional choice reported that their decision was mainly based on emotions ($M = 5.4$, $SD = 1.8$). Finally, participants making the rule-based choice reported that their decision was mainly based indeed on a rule, principle or norm ($M = 6.3$, $SD = 1.4$). One-way ANOVAs for each group of participants were all significant: $F(2,290) = 97.68$, $p < .001$, $w^2 = .40$ for the utilitarian respondents; $F(2,290) = 134.953$, $p < .001$, $w^2 = .48$ for the emotional

respondents; $F(2,290) = 85.895$, $p < .001$, $w^2 = .37$ for the rule-based respondents. A Tukey post-hoc test for each group revealed significant differences in the expected directions ($p < .001$). These results are all consistent with expectation regarding the assumptions motivating the three options in the new Refugees' Dilemma.

In-Group Bias effects

We next examined how an in-group bias influences moral choice (Figure 7). As expected, participants in Experiment 2b were more likely to opt for the utilitarian response (32.9%) than in Experiment 2a (7.2%). Also as predicted, emotional answers were similarly chosen by participants in both Experiment 2a and 2b (28.9% and 28.5%, respectively). The rule-based response was more likely for participants in Experiment 2a than in Experiment 2b (63.8% vs. 38.5%), indicating that rule following was increased by the in-group bias in Experiment 2a. A 3x2 chi-square test on response counts, with the variables Type of Response (Utilitarian vs. Emotional vs. Rule-based) and Experiment (Experiment 2a vs. Experiment 2b) was significant, $\chi2$ (2, N=1704) = 163.99, $p < .001$. More interestingly, we computed the absolute percentage change in rule-following (25.35%) across the two experiments and the absolute percentage change in utilitarian responses (25.77%) across the two experiments, as a quantitative measure of how the in-group bias influences moral choice. These results seem to support the idea that the in-group bias has an additive effect on response patterns, but no more complex interaction. A possible interpretation is that there is a fixed percentage of the population that just follows the in-group bias, irrespective of whether the response is utilitarian or rule-based.

<INSERT FIGURE 7 HERE>

Figure 7. Percentage of Utilitarian, Emotional and Rule-based responses for participants in Experiment 2a and Experiment 2b. Error bars represent standard errors.

High vs. Low Cognitive Resources and Psychological Distance

We then considered whether results from the CRT influence moral choice (Figure 4, right panel). As before, we report the CRT scores from participants using a CRT measure with 3-point scale from Frederic (2005). As expected, participants with the lowest CRT scores were more likely to opt for the emotional response ($M = 1.5$, $SD = 1.2$), than for the utilitarian and rule-based options. Similar CRT scores were observed for participants choosing the utilitarian and rule-based responses ($M = 2.0$, $SD = 1.1$; $M = 1.9$, $SD = 1.2$, respectively). A one-way between subjects ANOVA for these means was significant, $F(2, 290) = 4.178$, $p = .016$. A Tukey post-hoc test revealed that CRT scores were significantly different between participants making the emotional and the utilitarian selection ($p = .024$) and between participants making the emotional and rule-based selection ($p = .04$). There were no statistically significant differences between the utilitarian and the rule-based groups ($p = .951$). These results clearly indicate reflective processes for both the rule-based and the utilitarian routes to moral choice, more so than the emotional route. The results replicate those of Experiment 2a, regardless of differences in in-group bias.

We next examined whether different moral changes reflected the expected differences regarding Psychological Distance (see Figure 5, right panel). As in Experiments 1, 2a, participants opting for the rule-based option reported the highest distance ($M = 3.4$, $SD = 2$). Both participants making the utilitarian selection and the ones selecting the emotional answer ($M = 2.71$, $SD = 1.9$) reported same levels of distance ($M = 2.7$, $SD = 1.8$; $M = 2.7$, $SD = 1.9$; respectively). A one-way between subjects ANOVA for these means was significant, $F(2, 290) = 3.995$, $p = .019$, $w^2 = .027$. A Tukey post-hoc test revealed that psychological distance

was significantly different between participants making the utilitarian and the rule-based

selection ($p = .033$). There was no statistically significant difference between the utilitarian

and emotional groups and a marginally statistically significant difference between the

emotional and rule-based selection ($p = .989$; 0.062; respectively). Thus, in this experiment

we have further evidence that the rule-based route is associated with the greatest distance.

Political Views and Religiosity

We first explored the differences in moral choice, depending on participants' stated Political

Views (Figure 6, right panel). Conservatives were more likely to opt for the utilitarian

response (37.4%) compared to Moderates (36.6%) and Liberals (28.2%). Liberals and

Moderates were also more likely to opt for the emotional answer (30.5% and 30.9%,

respectively) compared to Conservatives (21.7%). Liberals and Conservatives were more

likely to opt for the rule-driven judgment (41.2% and 40.9%, respectively) compared to

Moderates (66.13%). The corresponding 3x3 chi-square test of independence was not

significant, F<1. Interestingly, if we compare these results with Experiment 2a, the data

appear to suggest a possible interaction, where conservatives are more influenced by the in-

group bias than liberals. Nevertheless, we consider such issues beyond the scope of the

current study and should be further explored in further research. We also ran a 3x2 chi-square

test of independence on Political Views (Liberals vs. Conservatives vs. Moderates) against

participants' levels of Psychological Distance (High vs. Low). The test was not significant, $\chi 2$

(2, N=284) = 1.45, $p = .483$.

Regarding religiosity, we selected only participants who reported Low vs. High levels

of religiosity as in Experiment 2a (Figure 6, right panel). High-Religious participants were

more likely to opt for the utilitarian response (40%) compared to Low-Religious ones

(30.7%). High-Religious participants were more likely to opt for the emotional answer

(27.7%) compared to Low-Religious ones (25.5%). Finally, Low-Religious participants were more likely to opt for the rule-driven judgment (43.8%) compared to High-Religious ones (32.3%). Note, a 3x2 chi-square test of independence on Type of Judgment (Utilitarian vs. Emotional vs. Rule-based) against participants' levels of Religiosity (Low vs. High) was not significant $F<1$.

Commitment to a Route for Moral Choice

The inclusion of the in-group bias in Experiments 2a, 2b allows a partial test of the robustness of moral route choice. Are there participants favouring a particular route to moral choice, regardless of the particulars of the situation? In the two presentations of the Refugees' Dilemma in Experiment 2b, at T_1 the in-group bias favoured the utilitarian choice and at T_2 the rule-based choice (the dilemma at T_2 was identical to the one employed in Experiment 2a). So, participants responding with a rule at T_1 would be 'encouraged' (by the in-group bias) to respond with a rule at T_2 too, while participants providing a utilitarian response at T_1 would be 'discouraged' for a similar response at T_2. The results indicate this to be the case (see Figure 8). 32.6% of all participants responded with a rule at T_1 and also responded with a rule at T_2, ($\chi2$ (1, N=582) $= 67.396$, $p < .001$; note, we are computing $Prob(rule\ at\ T_1\ \&\ rule\ at\ T_2)$ vs. $Prob(rule\ at\ T_1\ \&\ util\ or\ emotion\ at\ T_2)$, and analogously below); and from the participants who responded with a utilitarian way at T_1, only 7.5% also adopted the utilitarian route at T_2, with 25.42% choosing other routes ($\chi2$ (1, N=582) $= 19.237$, $p < .001$). So, regarding the rule-based and utilitarian routes to moral choice, the present results could indicate that participants might simply provide a response appropriate to the situation at hand, rather than in a way reflecting commitment to a particular route; though of course it is still possible that participants could very well have definite and stable route preferences, all we know is that in-group bias also exerts an effect. Interestingly,

there is some evidence that such a commitment may exist for the emotional route to moral choice, since of the participants making an emotional response at T_1, 20.6% also chose an emotional response at T_2, instead of 7.9% who adopted alternative responses ($\chi2$ (1, N=582) = 33.809, $p < .001$). Though note that this could also be expected just based on the fact that this was the only option that did not change.

<INSERT FIGURE 8 HERE>

Figure 8. Distribution of the total percentage of specific route responses for participants in Experiment 2b: participants who followed a specific route in T_2, given they had also responded following the same route at T_1.

Experiment 3

In Experiment 3, we wanted to test in an alternative way if rule-based judgments vs. emotion-based judgments exactly reflect a distinction between more thoughtful vs. more intuitive judgments, which is how researchers have cast the distinction between utilitarian vs. deontological moral choices, in traditional theory (Greene et al., 2001; Greene & Haidt, 2002; Greene et al., 2004; Koenigs et al., 2007). This possibility is actually undermined by the CRT results of Experiments 1, 2a and 2b, since, while high CRT performance was always associated with rule-based moral choice, emotional moral choices were sometimes associated with lower, sometimes not different CRT. However, what is possible is that when there are no tasks demands, in a situation like the Refugees' Dilemma, the emotional route to moral choice can be adopted through both a reflective and reflexive process; but task demands nudge towards the default processes away from the emotional route (reflexive) and, presumably, away from the rule-based route as well (reflective; cf. Korner & Volk, 2014).

A great deal of evidence in a number of domains supports the idea that more thoughtful/ reflective cognitive processes are more prone to interference from concurrent tasks engaging memory or executive processes, than more intuitive processes (e.g., Evans, 2003; Galotti, Baron & Sabini, 1986; Johnson-Laird & Bara, 1984; Kahneman, 2011). We manipulated cognitive load using a Dot Matrix Task, which aims to efficiently tap memory resources (as in Bonnefon, Hopfensitz & De Neys, 2013), so expecting fewer rule-based decisions.

Method

Participants

A total of 351 participants, all of whom were US residents, were recruited on-line and received $0.80 for doing the task (147 women, 204 men; M age = 37.2 years, SD = 12.1). We employed the same approach to calculate the minimum sample size needed as in Experiment 2b.

Materials and Procedure

The study was designed in Qualtrics, run on Amazon Mechanical Turk and lasted 10 minutes approximately. We used frequency of Type of Judgment (Utilitarian vs. Emotional vs. Rule-based) as the dependent measure. We used a dot matrix task (Bonnefon, Hopfensitz & De Neys, 2013) to manipulate cognitive load.

We followed similar procedures as in Experiment 1, 2a and 2b (consent form, basic demographic information, reinforcement learning task, attentional questions). All participants were presented with the version of The Refugees' Dilemma as in Experiment 2b (full text in Supplementary Material), under cognitive load. We opted for this version, because the in-group bias enabled a simpler version of the task. Before the choice regarding the refugees was

shown, a dot pattern in a 3x3 matrix was flashed for 1s. Participants had to keep the pattern in memory, while they saw the refugees choices and made their moral judgment. After participants had entered their response, they were presented with an empty matrix and had to indicate the location of the dots. Participants were presented with a randomly generated matrix filled with a complex four-dot pattern (see Supplemental Material for an example), whose retention efficiently taps memory resources (De Neys, 2006; Miyake, Friedman, Rettinger, Shah, & Hegarty, 2001). Training instructions stressed that it was crucial that the dot pattern was reproduced correctly in the upcoming task. In this experiment participants did not have to complete the CRT, the psychological distance measure and the questions regarding their levels of Religiosity and Political Views as in Experiment 1, 2a and 2b.

Results

Cognitive Load effects

We excluded those participants who did not answer the catch questions correctly (15/350) as in Experiments 1, 2a and 2b. No other sample trimming was conducted.

We examined how a cognitive load manipulation influences moral choice (Figure 9). Performance baselines for Experiment 3 follow results in Experiment 2b, since Experiments 2b and 3 were identical but for the inclusion of the cognitive load manipulation. Utilitarian responses were similarly chosen by participants in both Experiment 3 and 2b (31.7% and 32.9%, respectively). Importantly, as expected emotional answers were more likely for participants in Experiment 3 than in Experiment 2b (35.6% and 28.5%, respectively). Moreover, also as predicted, rule-based responses were less likely for participants in Experiment 3 than in Experiment 2b (32.6% vs. 38.5%), indicating that a high cognitive load has an impact on rule-based responses. The change in frequencies across Experiments 2b and 3 for the emotional and rule-based moral choices was significant, as assessed by a 3x2 chi-

square test on response counts, with the variables Type of Response (Utilitarian vs. Emotional vs. Rule-based) and Experiment (Experiment 2b vs. Experiment 3), $\chi2$ (1, N=423) = 3.90, p = .048, in the expected direction (that is, the concurrent task increased emotional choices and decreased rule-based choices).

<INSERT FIGURE 9 HERE>

Figure 9. Percentage of Utilitarian, Emotional and Rule-based responses for participants in Experiment 2b and Experiment 3. Error bars represent standard errors. *$p < 0.05$.

Discussion

Understanding the foundations of moral choice is a key objective in psychology, both for theoretical and practical reasons. There has been considerable progress based on the predominant formulation of moral choice as involving a contrast between a deontological and a utilitarian route (Greene, 2009). It seems likely that this distinction is relevant at a broad level, even if subsequent work has challenged the particulars of the original specification. Some studies have supported a view that the deontological route is often driven by a fast, gut-feeling process (e.g., Valdesolo & DeSteno, 2006) and the utilitarian by a slower, analytic one, but there have also been reports of inconsistent findings challenging the coherence of this theoretical picture. For example, consider recent findings such as the ones from Korner and Volk (2014), showing that deontological judgments can result from at least two different mechanisms; or the ones from Berns et al. (2012), consistent with the retrieval and processing of specific moral principles without having any enhanced emotional reactions; or the ones from Gamez-Djokic and Molden (2016), showing that in dilemmas involving violations of moral standards for the greater good, deontological judgments may also arise through non-affective routes when people are motivated by prevention. We think these are powerful ideas:

indeed, arguably, our intuition is that particular perspectives to a moral choice, such as deontological or utilitarian, can be approached via multiple mindsets (Korner & Volk, 2014).

In addition, the predominant experimental paradigms are based on sacrificial scenarios of ambiguous relevance to real life moral choices (Kahane et al., 2014). The present work was motivated by a belief that this view of moral choice requires an important extension, to include cold, external rules, e.g., as relating to the legal framework of a country. Amongst the extensive debate concerning the cognitive underpinnings of moral choice, we think it is a shortcoming that 'cold' (e.g., legal) rules have not been explored. Legal rules will sometimes also be utilitarian or deontological (or both), but clearly there are cases of such rules with no clear moral foundation or which do not benefit from an explicit moral justification. Extending moral choice experimental situations to include a rule-based route we think will allow more accurate inferences regarding the traditional routes, but also more plausible moral decision-making dilemmas.

Is there evidence for a route to moral choice based on cold rules, distinct from the utilitarian and emotional/ deontological routes? Across three experiments we provided several sources of evidence that this is the case, along with results complementing existing work on the utilitarian and emotional routes (Figure 10).

<div align="center">**<INSERT FIGURE 10 HERE>**</div>

Figure 10. Conceptual summary of all significant results from Experiments 1, 2a, 2b and 3.

First, according to Construal Level Theory (CLT), greater psychological distance would go hand-in-hand with lower emotional involvement. We found that rule-based respondents reported the highest average distance, more so that even utilitarian respondents. Such a result is consistent with the nature of the rule provided in The Refugees' Dilemma,

since application of the rule forces one to ignore most particular characteristics of the different options. Note, there was no evidence that participants may have ascribed deontological and/ or utilitarian meaning to the provided rules. Second, participants with the lowest CRT scores were in general more likely to opt for the emotional response and high CRT participants were more likely to adopt utilitarian or rule-based responses. Third, our results indicated that a high cognitive load reduced the rate of rule-based responses and increased the rate of emotion-based ones, a result which suggests that the default process supporting rule-based choices is reflective and the emotional ones reflexive. Moreover, the proportion of utilitarian responses was indeed less affected by the cognitive load manipulation, so challenging the traditional approach of considering utilitarian choices as (just) reflective. So, on the one hand, utilitarian choices went hand in hand with high CRT (but not higher distance), but on the other hand were not influenced by cognitive load. The present results support a view of utilitarian responses as intermediate between rule-based and emotional ones, regarding the reflective, reflexive continuum and psychological distance. Fourth, and partly for applied interest, we showed the non-identity between political belief and religiosity patterns, across participants favoring different routes to moral choice.

Is the proposal of a cold, rule-based route to moral decision making justified? In the traditional two-way distinction, deontology reflects the importance of embedded norms and principles of what is right or wrong and utilitarianism the broader notion of good for the greater number of individuals. By contrast, cold rules would be ones that are e.g. imposed by a higher authority (e.g., a legal framework), without explicit appeal to morality (even if it can be assumed that such rules eventually benefit a rationale, moral or otherwise). We suggest that in everyday life many of the moral choices we make exactly reflect a tension between what we emotionally perceive as right, an imposed rule that has to be obeyed, and a principle of benefiting more individuals. But, if participants are given a default imposed rule, is it the

case that adopting the rule just eschews the moral choice altogether? We think this is incorrect: there is still a moral choice, since even rule-complying responses require the circumvention of both emotional bias and utilitarianism. Indeed, many participants eschewed compliance with the given rule, to adopt either emotional or utilitarian responses. This could also be understood as a two-phase process. First, to follow the rule or to take matters into your own hands. If you chose the latter, then you have the utilitarian/deontological choice. The differences between Experiment 1 and 2a seem to indicate that at a minimum the decision about following the rule will depend on what that rule is (and possibly in-group bias).

Finally, this discussion brings to the fore the more cognitive issue of what should be considered a rule in moral choice. There has been extensive discussion in cognitive psychology (Pothos, 2005), with possibly relevant implications about methodology and theory in moral choice.

In order to meaningfully engage different routes to moral choice, we think it is useful to include scenarios closer to real-life, current problems. We developed a new paradigm for moral choice, the Refugees Dilemma, which is based on current affairs and should resonate with political preoccupations for most participants recruited especially in Europe and North America. As with all cognitive tasks of this kind (including the widely employed Trolley dilemma; Thomson, 1985), participants received fairly unspecific information regarding the hypothetical individuals in the Refugees Dilemma. Despite the potential elaborative processes that individual participants might engage in and any personal biases, it was possible to identify fairly robust behavioural patterns across three experiments. Moreover, with a view to achieve greater real-world relevance in the Refugees Dilemma task, we therefore examined the impact of an in-group bias (Tajfel et al., 1971; Yamagishi et al., 1999; Fowler and Kam, 2007), as aligned with different options. As expected, the in-group bias had a significant impact on moral choice. However, even though the in-group bias affected moral choice,

crucially, there was no evidence that it influenced either the way high vs. low CRT participants preferred rule-based responding or how distant participants felt from the situation in each response option.

All these issues reveal considerable challenges and corresponding exciting directions for future work. For example, a major challenge in understanding moral choice concerns whether each route to moral choice can be understood in isolation or whether the range of options can result in contextual influences/ interactions as well. This possibility is raised by the impact of changing the in-group bias across Experiments 2a and 2b. In decision making, it is well known that context can impact on behavior (e.g., Trueblood et al., 2014), but it is unclear whether analogous results can robustly be observed in moral choice and, indeed, whether they can moderate the way the same moral choice can be approached in a fast or reflective way. This is an exciting direction for future research. A related perspective is that there may be default processes for different kind of moral choices, but when there is ample time (or other factors encourage more careful considerations) these defaults are circumvented (cf. Korner & Volk, 2014). There was an indication that this might be the case both in relation to the CRT results for emotional choices in Experiments 1 vs. 2a and 2b (in the former, emotional choices appeared more reflective than in the latter, which could be attributed to the higher complexity of the scenario in Experiment 1; cf. Oppenheimer et al., 2017).

Overall, we were able to identify consistent and robust trends across three experiments with the novel Refugees Dilemma, for three distinct routes to moral decision-making, the two traditional ones (emotion-based and utilitarian) and a novel rule-based route to moral judgment. We also reported results consistent with previous work, that emotional choices were generally associated with the lowest psychological distance and reflexive processes and utilitarian choices with intermediate psychological distance and intermediate CRT. We hope that future work will further explore moral decision situations informed by relevant current

affairs or near-future social dilemmas (e.g., Bonnefon et al., 2016). Partly with a mind to such applications, we reported some interesting correspondences between moral choice in The Refugees' Dilemma and participants' political affiliations and religious convictions.

Acknowledgments

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