



Brief article

Time and moral judgment

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ARTICLE INFO

Article history:

Received 5 July 2010

Revised 18 January 2011

Accepted 30 January 2011

Available online 26 February 2011

Keywords:

Morality

Judgment

Reasoning

Intuition

Moral dilemmas

Time pressure

ABSTRACT

Do moral judgments hinge on the time available to render them? According to a recent dual-process model of moral judgment, moral dilemmas that engage emotional processes are likely to result in fast deontological gut reactions. In contrast, consequentialist responses that tot up lives saved and lost in response to such dilemmas would require cognitive control to override the initial response. Cognitive control, however, takes time. In two experiments, we manipulated the time available to arrive at moral judgments in two ways: by allotting a fixed short or large amount of time, and by nudging people to answer swiftly or to deliberate thoroughly. We found that faster responses indeed lead to more deontological responses among those moral dilemmas in which the killing of one to save many necessitates manhandling an innocent person and in which this action is depicted as a means to an end. Thus, our results are the first demonstration that inhibiting cognitive control through manipulations of time alters moral judgments.

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1. Introduction

You are in a subway station, the train is approaching, and a passenger standing next to you suddenly falls onto the tracks: in a fraction of a second, you must decide what to do. Although it sounds like fiction, this is exactly what happened to Wesley Autrey, a 50-year-old construction worker, in New York's subway in 2007. He saw a neighboring passenger collapse, his body convulsing. The man managed to get up, but then tumbled onto the tracks as the train sped into the station. In a split second, Autrey made his decision. He threw himself on top of the man and held him down in the shallow trench between the rails. Both survived. When asked about the reason for his action, he responded, "I just saw someone who needed help (...). I did what I felt was right" (Buckley, 2007).

But how would he have acted with more time to ponder? Had he, for instance, been standing on the deck of the sinking *RMS Titanic* in 1912, he would have had nearly 3 h to deliberate on the consequences of saving his own life, or sacrificing himself for the lives of other more vul-

nerable passengers. Combing through historical records, Frey, Savage, and Torgler (2009) found that in the *Titanic* disaster the crew's survival rate was 18% higher than that of the passengers. According to their interpretation, the members of the crew took advantage of better access to information and lifeboats, thus behaving in line with their self-interest.

These examples illustrate that when moral decisions are forced upon us, they may vary a great deal depending on the time that is available for their consideration. Some moral questions afford us the luxury of contemplating them carefully—for instance, the decision concerning life-sustaining measures for a family member who has fallen into a persistent vegetative state. Other situations with moral implications only grant us a moment to respond—shall I thwart the act of shoplifting occurring in my face? The two introductory examples suggest that time or lack thereof could be a key parameter in determining which cognitive processes, judgments, and actions we engage in response to problems with moral implications. Investigating the role of time was the aim of the present studies. Our focus was on *judgment* rather than *behavior*, and more specifically, on an influential dichotomy in ethics, namely, that between deontology and consequentialism.

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2. Deontology, consequentialism and a dual-process model of moral judgment

Simply put, consequentialism is the notion according to which right actions are those that maximize good outcomes; that is, an action should be evaluated solely by reference to the merits of its consequences. Deontology, in contrast, measures the moral quality of an action in terms of features of acts other than their outcomes. Specifically, deontologists emphasize moral rules, most often articulated in terms of rights and duties. This does not mean that for deontologists, consequences do not matter, rather that circumstances can arise that require and allow us to take actions that will not yield the best consequences for all concerned. For example, a deontologist might say that it would have been wrong for a crew member of the *Titanic* to force a person over the side of an overcrowded lifeboat, even if doing so saved the lives of several others (Kagan, 1998). Killing one to save many violates this innocent person's rights or other moral norms.

Psychological investigations into people's moral judgment have commonly employed moral dilemmas that render possible a classification of people's binary responses into those consistent with deontological (adhering to rights and duties) or consequentialist (maximizing good outcomes) concerns (e.g., Greene, Morelli, Lowenberg, Nystrom, & Cohen, 2008). Among those dilemmas, Greene, Sommerville, Nystrom, Darley, and Cohen (2001) have drawn a distinction between *personal* and *impersonal* moral dilemmas, whereby the crucial difference between the two lies in the emotional response that they trigger or fail to trigger and in the associated judgments. Personal dilemmas—for instance, picture an overcrowded lifeboat in which a crew member throws someone out to keep it afloat—tend to engage emotional processing to a greater extent than dilemmas necessitating less personal agency (e.g., the crew member only needs to hit a switch to remove the passenger). Greene et al. (2001) showed that impersonal moral dilemmas commonly produce consequentialist responses (i.e., it is right to save more lives), whereas personal dilemmas are more likely to trigger automatic, emotional reactions in conjunction with deontological responses (i.e., sacrificing the victim is wrong despite the benefits). Furthermore, within the class of personal dilemmas, deontological choices are most pronounced when the inevitable harm is perceived to be a means to an end as opposed to a foreseeable side-effect of reaching a goal (Cushman, Young, & Hauser, 2006).

To account for this difference, Greene et al. (2001) proposed a dual-process theory of moral judgment. It rests on the following assumptions. First, there are two kinds of information processes: controlled cognitive and intuitive emotional. Second, emotional processes trigger deontological judgments, whereas controlled cognitive processes tend to prompt consequentialist judgments. Third, processes do not contribute equally in all dilemmas, because of the dilemma's varying propensity to evoke and engage people's emotions. Fourth, when harmful actions are depicted as sufficiently remote from us (as in impersonal problems), they fail to push our emotional buttons. Consequently, we think about them in a more cognitive, "de-

tached, actuarial fashion" (Greene, 2007, p. 43), making us more inclined to endorse those actions. In contrast, when harm is personal—for instance, involves roughing up a fellow human—alarm-like emotional responses are triggered, and people are more likely to abjure killing one to save many.

One prediction following from these assumptions is the following: Should a consequentialist judgment be reached in a personal dilemma that engages us emotionally, our initial deontological impulse must be cognitively controlled. This process of overriding takes time, and requires the engagement of higher cognitive processes (Greene, 2007). Consistent with this prediction, Greene et al. (2008) found that participants who responded to personal dilemmas under the burden of cognitive load *and* who arrived at consequentialist judgments required more time relative to a no-load condition. It is noteworthy, however, that the imposition of cognitive load did not result in fewer consequentialist judgments, relative to the no-load condition. Consistent with the dual-process model, cognitive load had no impact on the time needed to reach deontological judgments (see also Greene et al., 2001 and McGuire, Langdon, Coltheart, & Mackenzie, 2009). Relatedly, Greene, Nystrom, Engell, Darley, and Cohen (2004) found that contemplation of personal dilemmas, relative to impersonal dilemmas, selectively recruits emotional circuits, and brain regions associated with cognitive control showed increased activity preceding consequentialist judgments in personal dilemmas.

These findings are consistent with the dual-process model of moral judgment. In none of the experiments, however, was time to reach a judgment directly manipulated. Previous studies analyzed the response time *conditioned* on the deontological or consequentialist judgment (Greene et al., 2001, 2008). Here we will examine whether people's deontological impulse manifests more strongly when less time is available to recruit controlled cognitive processes to overturn the impulse. We manipulated time in two ways: In Experiment 1, we subjected participants to time pressure; in Experiment 2, we allowed participants to pace their response time but instructed them either to answer as quickly as possible, or to deliberate thoroughly. A judge who deems a personal violent action appropriate as a means to reach the end of a greater good (e.g., someone who says "yes" to throwing a person overboard) will, so the theory goes, have to override a revulsion to manhandling an innocent person. This takes time. If people are put under time pressure, and thus lack the time to control their emotional response, then the likelihood of "no" (deontological) responses should increase. However, time pressure should not boost the prevalence of "no" responses in impersonal ("cold") moral dilemmas, and possibly not even in personal moral dilemmas in which harm is foreseen as a side-effect of reaching a goal rather than as a means to an end. In both experiments, we will employ moral dilemmas that have commonly been used to investigate the tension between deontology and consequentialism. These dilemmas typically represent a conflict between the rights of another person (e.g., the passenger in a lifeboat who is targeted to be thrown out) and the good of a larger number of others (e.g., the other passengers whose lives are saved as

a consequence). We can thus also investigate to what extent time is critical in conflicts other than those between self-interest and the greater good of others, which was the conflict depicted in our introductory examples.

3. Experiment 1

3.1. Method

3.1.1. Participants and design

Sixty-seven psychology students from the University of Basel (45 women; age range: 17–46 years, $M = 24.7$, $SD = 5.8$) participated for course credit in the study. They were randomly assigned to either the *time-pressure* condition ($n = 33$), in which respondents had to produce their response within a maximum of 8 s, or the *no-time-pressure* condition ($n = 34$), in which respondents took 3 min to deliberate before answering. The answer was either “yes” (i.e., the consequentialist response) or “no” (i.e., the deontological response) in response to the question of whether they deemed the proposed action to be morally right.

3.1.2. Materials

Based on the results of a pilot study (without time pressure), we selected 10 moral dilemmas (five personal and five impersonal ones) that about equally likely gave rise to both yes and no responses, respectively. Dilemmas that produced predominantly one or the other response were excluded to reduce the risk of ceiling or floor effects. Participants in each condition responded to all moral dilemmas. We distinguished personal dilemmas according to whether harm caused was depicted as a side-effect (*low-conflict*) or as intended as the means to an end (*high-conflict*).¹ The personal low-conflict dilemmas were the fireman dilemma and the boat-action dilemma (see Greene et al., 2009; Hauser, Tonnaer, & Cima, 2009); dilemmas in the latter category were the submarine, the crying baby, and the lifeboat dilemma (Greene et al., 2008). As impersonal moral dilemmas we selected the standard fumes, speedboat, donation, lost wallet, and the boat (side-effect-no-personal-force) dilemmas (see Greene et al., 2008, 2009). We paraphrased dilemmas such that no names were mentioned and participants were not addressed as if they themselves were the actor performing the action.

3.1.3. Procedure

Participants first read the dilemma and could then forward to the next page, where the question appeared. The description of the dilemma remained on the screen for maximally 35 s, after which the computer automatically forwarded to the question screen. Participants in both conditions took, on average, 26.87 ($SD = 4.39$) and 28.25 ($SD = 4.24$) s, respectively, to read a dilemma before they advanced to the question screen. They indicated their

choice by clicking one of two buttons. The choice could not be reversed.

In the time-pressure condition, participants had no more than 8 s to read the question, consider it, and enter their judgment. Placed above the question, a countdown indicated the passage of time. After the time had expired, it was no longer possible to enter a judgment. In the no-time-pressure condition, participants were instructed that they would have 3 min to deliberate, and that they were not able to respond before the allotted time had passed.

3.2. Results

In the time-pressure condition, response time was recorded as soon as the question screen appeared. Participants took on average less than 3 s to respond ($M = 2853$ ms, $SD = 786$), and only three participants missed answering one of the dilemmas. Consistent with Greene et al.'s (2001) dual-process theory of moral judgment, participants in the time-pressure condition, relative to the no-time-pressure condition, were more likely to give “no” responses in high-conflict dilemmas. As Table 1 shows, in low-conflict and in impersonal moral dilemmas, the proportion of “no” responses did not differ between conditions.²

4. Experiment 2

Recently, Payne, Samper, Bettman, and Luce (2008) demonstrated—in the context of Dijksterhuis, Bos, Nordgren, and van Baaren's (2006) theory of unconscious thought—that when conscious thought was constrained to persist for a (artificially) long time its effectiveness could be impaired. We did indeed make people deliberate for a long time in the no-time-pressure condition. Yet, the higher frequency of consequentialist responses—according to Greene (2007) indicative of a more cognitive, detached, and actuarial way of thinking—does not suggest that their moral judgment was impaired. Nevertheless, Experiment 2 examined whether we could replicate Experiment 1's finding if we nudged respondents to naturally give intuitive versus deliberate responses via instructions rather than via constrained processing time.

4.1. Method

4.1.1. Participants and design

Eighty psychology students from the University of Basel (48 women; age range: 18–49 years, $M = 23.3$, $SD = 5.2$) participated for course credit in the study. They were randomly assigned to the *self-paced-intuition* ($n = 40$) and the *self-paced-deliberation* condition ($n = 40$), respectively.

¹ Recently, Greene et al. (2009) elaborated on their distinction between personal and impersonal dilemmas, redefining “personalness” in terms of “personal force.” Moreover, they showed that personal force interacts critically with the agent's intention (means versus side-effect).

² As the number of ranks in the Mann–Whitney test was low for personal low-conflict dilemmas, we also conducted an analysis using chi-square statistics. The pattern remained the same, with a significant difference between conditions for personal high-conflict dilemmas, $\chi^2(3, N = 67) = 7.27, p = .032$ (one-tailed), $V = .33$, and no difference between conditions for personal low-conflict or impersonal dilemmas, respectively.

Table 1

Average proportion of “No” responses (deontological responses) separately for conditions and type of moral dilemma (high- versus low-conflict personal and impersonal dilemmas) in Experiments 1 and 2.

Experiment 1						
Dilemma type	Time-pressure (n = 33)	No-time-pressure (n = 34)	Statistics			
	M	M	U	z	p	r ^a
Personal						
High conflict ^b	0.52	0.31	364.00	−2.556	.011	−0.31
Low conflict ^c	0.21	0.26	549.50	−0.166	.868	−0.02
Impersonal	0.42	0.35	423.50	−1.466	.143	−0.18
Experiment 2						
Dilemma type	Self-paced-intuition (n = 40)	Self-paced-deliberation (n = 40)	Statistics			
	M	M	U	z	p	r ^a
Personal						
High conflict ^b	0.50	0.32	587.50	−2.125	.034	−0.24
Low conflict ^c	0.22	0.26	724.00	−.840	.401	−0.09
Impersonal	0.41	0.39	743.50	−.579	.563	−0.06

^a This column indicates the effect size r ; $r = .1$ indicates a small, $r = .3$ a medium, and $r = .5$ a large effect.

^b High-conflict personal dilemmas are ones in which harm is depicted as means to an end.

^c Low-conflict personal dilemmas are ones in which harm is depicted as a side-effect.

4.1.2. Materials and procedure

Materials and procedure were identical to Experiment 1. Participants in the self-paced-intuition condition were instructed to answer all questions as quickly and intuitively as possible. In the self-paced-deliberation condition, participants were told that they could take as much time as they desired to deliberate. Participants in both conditions took, on average, 28.98 ($SD = 4.66$) and 27.61 ($SD = 3.89$) s, respectively, to read a dilemma before they advanced to the question screen.

4.2. Results

In both conditions, response time was recorded as soon as the question screen appeared. Participants in the self-paced-deliberation condition took about three times longer to respond ($M = 12,092$ ms, $SD = 20,947$) than those in the self-paced-intuition condition ($M = 4452$ ms, $SD = 2721$), $t(41.38) = 2.32$, $p = .026$, 95% CI (0.993, 14.288). Consistent with the results in Experiment 1, in personal high-conflict dilemmas faster responses were more likely to be deontological than slower responses. As Table 1 shows, no such trend occurred for personal low-conflict problems and for impersonal problems, respectively.³ Fig. 1, in which we collapsed the proportion of deontological responses in Experiments 1 and 2 across fast and slow conditions, respectively, depicts the interaction between time taken to reach a response and type of dilemma.

5. Conclusion

We employed two methods to manipulate the time available to people before responding to moral dilemmas.

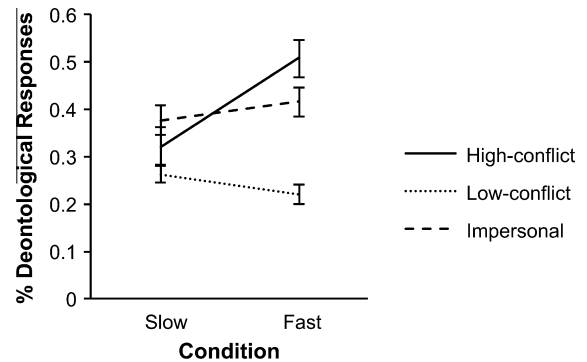


Fig. 1. Average proportion of deontological responses separately for conditions and type of moral dilemma (high- versus low-conflict personal and impersonal dilemmas) with data combined across the fast (i.e., time-pressure and self-paced-intuition) and slow conditions (no-time-pressure and self-paced-deliberation) in Experiments 1 and 2, respectively. Error bars represent standard errors. Only responses to high-conflict dilemmas differed significantly between the conditions (see Table 1).

First, we pressured them to answer quickly or to deliberate protractedly by defining a fixed-time budget. Second, we allowed participants to pace their response times themselves but nudged them to answer intuitively and swiftly versus to deliberate for as long as they desired. Across both time manipulations, the prevalence of deontological responses increased when people responded faster. This effect of time on the actual moral judgment, however, only occurred for those personal dilemmas portraying harm as a means to an end, but not in personal problems with harm depicted as a side-effect or in impersonal problems.

To the best of our knowledge, ours is the first demonstration of the impact of time on moral judgment. Specifically, the results suggest that when the time to cognitively control the first moral gut response is lacking or is not invested, the likelihood of deontological response increases, consistent with Greene et al.'s (2001, 2008) dual-process model of moral judgment. On this view and consistent

³ As in Experiment 1 (see Fn 2), we conducted a chi-square analysis and observed the same pattern of results: a significant difference for personal high-conflict dilemmas, $\chi^2(3, N = 80) = 6.93$, $p = .037$ (one-tailed), $V = .29$, and no difference for personal low-conflict or impersonal dilemmas, respectively.

Table 2

Average proportion of “No” responses (deontological responses) in the unconscious-thought condition (UT) relative to the average proportions of conditions in Experiments 1 and 2.

Comparison to the unconscious-thought condition ($n = 34$)						
Condition	$M_{\text{Experiments 1 and 2}}$	M_{UT}	U	z	p	r^a
Time-pressure	0.52	0.31 ^b	366.00	−2.532	.011	−0.309
No-time-pressure	0.31	0.31 ^b	572.00	−0.078	.938	−0.009
Self-paced-intuition	0.50	0.31 ^b	488.00	−2.164	.030	−0.252
Self-paced-deliberation	0.32	0.31 ^b	665.00	−0.172	.863	−0.021

Note: Judgments of low-conflict personal and impersonal dilemmas did not differ significantly between conditions (all $ps > .05$). Displayed are judgments of high-conflict personal dilemmas.

^a This column indicates the effect size r ; $r = .1$ indicates a small, $r = .3$ a medium, and $r = .5$ a large effect.

^b The results in the UT condition were compared to each of the other conditions (column $M_{\text{Experiments 1 and 2}}$); therefore, all entries in the column M_{UT} refer to the same data.

with our results, time (or lack thereof) acts as a gatekeeper that determines whether cognitive control processes can unfold. Interestingly, however, cognitive control processes do not have to be conscious. In an additional condition, we instructed participants to give intuitive judgments after 3 min of distraction (see Dijksterhuis et al., 2006). These judgments are hypothesized to be based on *unconscious thought*, which is assumed to process information automatically during the time of distraction (Dijksterhuis et al., 2006). Such unconscious thought processes also appear to be able to control the first moral gut response: Judgments of personal high-conflict dilemmas were significantly more likely to be consequentialist relative to the time-pressure and the self-paced-intuition conditions in Experiments 1 and 2, respectively (Table 2; see also Ham & van den Bos, 2010).

Our studies are consistent with the view that consequentialist choices represent a victory of a cognitive cost-benefit analysis over an emotional impulse. Yet, we have not recorded emotional processes, and it is quite possible that processes other than emotions mediate intuitive moral judgments (see Huebner, Dwyer, & Hauser, 2009). Notwithstanding this ongoing debate, what we are beginning to discern is that our moral decision-making is time sensitive: time mediates the judgment that is reached.

Acknowledgments

We thank Laura Wiles for editing the manuscript and the Swiss National Science Foundation for a grant to the second author (100014_125047/2).

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