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The effect of hunger and satiety in the judgment of ethical violations

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ABSTRACT

Human history is studded with instances where instinctive motivations take precedence over ethical choices. Nevertheless, the evidence of any linking between motivational states and morality has never been systematically explored. Here we addressed this topic by testing a possible linking between appetite and moral judgment. We compared moral disapproval ratings (MDR) for stories of ethical violations in participants under fasting and after having eaten a snack. Our results show that subjective hunger, measured via self-reported rating, reduces MDR for ethical violations. Moreover, the higher the disgust sensitivity the higher the MDR for ethical violations. This study adds new insights to research on physiological processes influencing morality by showing that appetite affects moral disapproval of ethical violations.

1. Introduction

Human history, such as in the case of Andes flight disaster in 1972 (e.g., Read, 1974), teaches that physiological privation can affect ethical choices to the point of abrogating individuals' common moral sense of right and wrong.

Two more recent experimental studies provide results in this direction suggesting that morality and appetite are linked. The study by Chan, Van Boven, Andrade, & Ariely (2014) has shown that the exposure to ethical violations, such as watching a film portraying the moral violations of incest, reduces food consumption. This leads to the suggestion that, if the relation food consumption-morality is bidirectional, one might expect that the lower the appetite, the higher the disapproval severity of moral violations. In contrast with this study, the work by Danziger, Levav, & Avnaim-Pesso (2011) indicates that hunger can make harsher the moral disapproval for ethical violations. The authors of this study reported that the percentage of favorable judicial rulings for crimes dropped gradually from ≈65% to nearly zero while the break was approaching, and returned abruptly to ≈65% after a break. Therefore, the closer the food break (which might indicate an increasing sensation of appetite), the higher the probability to condemn a crime. However, this study did not manipulate and/or control the judges' appetite. Therefore, it is not clear if the reported result is due to eating restore or the simply resting.

In summary, the literature mentioned above provides insights into the existence of a possible linking between morality and appetite. However, it does not allow making consistent predictions about the potential influence of this physiological state on moral judgment. While the study by Chan et al. (2014) leads to predict an increment of moral disapproval in people reporting low hunger, as the exposure to moral violations reduced food consumption, the research by Danziger et al. (2011) suggests the opposite, as favorable rulings in the judgment of a crime progressively decreased with the approaching of the food break, while they return to increase after it.

A linking between appetite and morality is also suggested by neuroimaging research. Experimental evidence has shown the involvement of the anterior insula, the Anterior Cingulate Cortex (ACC) the ventromedial prefrontal cortex (vmPFC) and the medial Orbito Frontal Cortex (mOFC) in moral judgment (Moll et al., 2002; Sanfey, Rilling, Aronson, Nystrom, & Cohen, 2003; Hutcherson, Montaser-Kouhsari, Woodward, & Rangel, 2015; Ciaramelli, Muccioli, Làdavas, & di Pellegrino 2007; Vicario, Rafal, Martino, & Avenanti, 2017 for a review on clinical models), as well as in the processing of interoceptive/appetite signaling (Tataranni et al., 1999. See also Eiler, Dzemidzic, Case, Considine, & Kareken, 2012). This neural overlap is in line with the evidence of insular-frontotemporal regions integrating interoception, emotion, and social cognition (Adolfi et al., 2016).

In the current research we have directly manipulated and measured the subjective sensation of hunger preceding and following the consumption of a snack, during the execution of a moral judgment task, to address the role of appetite on moral decision making. Moreover, we have measured the disgust sensitivity (DS) trait of our participants to

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explore the contribution of this variable in the expected appetite-morality linking, as this trait is known to be higher in individuals providing higher disapproval ratings for ethical violations (Inbar, Pizarro, Knobe, & Bloom 2009; Horberg, Oveis, Keltner, & Cohen 2009; Vicario & Rafal, 2017), including individuals with authoritarian attitude (Liuzza et al., 2018), which tend to punish perceived moral transgressions (Altemeyer et al., 1998).

We compared the effects of fasting and snack in the moral disapproval rating (MDR) of standard stories of ethical violations (i.e., moral dilemmas) created by Greene, Sommerville, Nystrom, Darley, & Cohen (2001). The use of moral dilemmas is a well consolidated approach for the study of moral decision making during behavioral manipulations (e.g., see Eskine, Kacinik, & Prinz, 2011). Thus, participants have been tested after a short period of fasting, and immediately after having eaten a snack. We adopted this experimental manipulation to induce a significant change in the participants' subjective hunger status; and, at the same time, provide a control for the depletion manipulation, which is known to affect decision-making (e.g., Muraven & Baumeister, 2000; Pocheptsova, Amir, Dhar, & Baumeister, 2009), such as decreasing the tendency to avoid extreme choices (Pocheptsova et al., 2009).

2. Method

2.1. Participants

53 university students (18 males, age: M = 20.6, SD = 3.6) participated to this study in change of credits or a payment of 6 £. The number of participants of our study was based on previous reports in the field (e.g., see Eskine et al., 2011). All subjects had normal or corrected-to-normal visual acuity. They gave written informed consent to participate in this study and were naı̈ve as to its purpose. Specific information concerning the study was provided only after the subjects completed all the experimental sessions. The study was approved by the ethics board of the School of Psychology and was conducted in accordance with the principles of the 1964 Helsinki.

2.2. Materials and apparatus

Moral disgust was measured by using 12 (moral) and 12 (non-moral) dilemmas adapted into short vignettes by Harrison et al. (2012) from the study of Greene et al. (2001). An example of moral and non-moral stories follows: Moral story: "*During the Second World War in Poland Mrs. Jones and her children, a girl and a boy, are imprisoned in a concentration camp. Once they are there, a guard tells Mrs. Jones that she must choose one of her children to live. The other will die in the gas chambers. If she does not choose either of them, both will be killed*". Non-moral story: "*Mr. Jones is going away for the weekend. He is driving his car and comes to a fork in the road. The right turn leads to a seaside town, with a superb beach. The left turn leads to a mountain town, with beautiful views. After thinking for a moment, he decides to take the right way and spend a couple of days by the sea*"; The full set of vignettes adopted in our research can be visualized in this link: https://www.researchgate.net/publication/323079179_Moral_and_control_stories.

These dilemmas are considered to be particularly emotionally engaging because they prompt one to endorse actions that directly imply bodily harm to a victim (or set of victims) in which utilitarian judgments tend to violate conventional moral social standards (Harrison et al., 2012). Dilemmas were divided in two blocks (i.e., A and B blocks) of 12 vignettes (i.e., 12 moral dilemmas and 12 non-moral dilemmas) and were administered in a counterbalanced order. The two blocks of vignettes were presented in two separated paper booklets, with one vignette per page.

Participants provided their self-reported Hunger Rating (HR) using a 10 cm Visual Analogical Scale (VAS), with anchor points labeled 'Not at all' to 'Extremely' hungry. MDR were measured by using a VAS, with anchor points labeled 'Not at all' to 'Extremely' disapproving. VAS lines were presented in a paper document. To express their rating, participants were required to bisect the presented VAS (one per vignette). 20 participants (group 1) were tested twice in the same day: after at least 12 h (M = 13.57 ± 0.702 SD) of overnight fasting (first session) and immediately after (second session) having eaten a snack (i.e., some bananas). The remaining 33 participants (group 2) have been tested with the same protocol but after a break of 24 h. Therefore, approximatively half sample started the first session after at least 12 h of sleep but before having eaten the snack (fasting session); and the second session after at least 12 h of sleep (Snack session) but immediately after having eaten the snack. In the other half of participants such order was reversed. This way, it was possible to counterbalance the order of fasting/snack sessions among participants, which was not provided in the group 1 (in this case the first session was always the fasting session). Participants were explicitly requested to eat the snack until they felt satisfied.

2.3. Data analysis

Four people have been excluded from the final analysis. One participant was excluded from the group 1 because his self-reported hunger rating in the snack condition was outlier (i.e., 5 SD higher than the group average). The remaining 3 participants belonging to the group 2 have been excluded for the following reasons: one participant was not included as he did not attend both sessions; one participant was not included because he declared to have had breakfast before attending the snack session; one participant was not included as he declared to be familiar with the experimental procedure and the presented stories. Thus, the final analysis was performed on 49 participants.

To test our hypothesis, we firstly performed an Analysis of Covariance (ANCOVA) similar to the one adopted in a previous study (Vicario, Kuran, & Urgesi, 2017), which included the MDR scores provided for the two types of stories (moral vs. no moral) as dependent variable and the two types of administration (in the same day vs. in separated days), the two physiological conditions (fasting vs. snack) as categorical predictors, and the self-reported hunger ratings as covariate. This way, we could test not only the effects of food depletion and intake (i.e., in association to fasting vs. snack condition) on MDR, but also those of the individual perceived level of hunger in each condition.

Since the covariate showed significant interactions with the other variables, we assessed the effects of these within-subject variables (or their interaction) on the dependent variable by performing two Pearson correlation analyses with the following variables: (i) appetite mean vs. MDR mean collected in the fasting and snack conditions; (ii) change in appetite score (Appetite fasting - Appetite snack) vs. MDR interaction score (i.e. Moral/Fasting - Moral/Snack - (NoMoral/Fasting - NoMoral/Snack). Moreover, we performed a Pearson correlation analyses between the Disgust Sensitivity (DS) trait, measured via DS-R scale (Haidt, McCauley & Rozin, 1994), and the MDR interaction score to investigate the contribution of this variable on moral judgment. Finally, we performed a moderation analysis to investigate whether the DS trait plays a moderation role in the link between appetite and morality. To this purpose we used a SPSS macro created by Kristopher J. Preacher (http://quantpsy.org/medn.htm). The other analyses have been performed with Statistica Soft 8.0. The p-level was set at 0.05.

3. Results

The ANCOVA did not document significant results for the types of administration [$F(1, 93) = 0.025$, $p = 0.617$, $\eta^2 < 0.002$] and the physiological condition [$F(1, 93) = 1.354$, $p = 0.247$, $\eta^2 = 0.014$] predictors. Likewise, no significant interaction was reported for the two predictors [$F(1, 93) = 0.911$, $p = 0.342$, $\eta^2 = 0.009$]. Moreover, no significant results were reported for the type of story x physiological condition [$F(1, 93) = 0.466$, $p = 0.496$, $\eta^2 = 0.004$], the type of story