

## ***Recent Trends in Neuroethics: A Selected Bibliography***

Andrea Polonioli  
Facoltà di Filosofia  
Università Vita-Salute San Raffaele  
andrea\_polonioli@hotmail.com

### **ABSTRACT**

This article is concerned with major current developments in moral psychology, deriving from the study of the neurobiological bases of our responses to moral dilemmas. I briefly illustrate the most important research programs and outline the burning issues in neuroethics, both empirical and conceptual.

“The rules of justice may be compared to the rules of grammar; the rules of the other virtues, to the rules which critics lay down for the attainment of what is sublime and elegant in composition.”

Adam Smith, *Theory of Moral Sentiments*

### **1. Introduction**

The most part of the philosophical and scientific literature in what is called neuroethics revolves around dilemmas. The most famous ones are a family of thought experiments usually called “the trolley problem” (after a famous example created by philosopher Philippa Foot in 1967), which have at least two major versions.

Imagine that you are faced with these two hard choices. In the first one - the *trolley dilemma* (Foot 1967; Thomson 1986) - a runaway trolley is directed towards five people, who will be killed if it continues on its present course. The only way to save them is to hit a switch and turn the trolley onto other tracks, where it will run over and kill one person instead of five. Would you hit the switch?

The second dilemma - the *footbridge dilemma* (Thomson 1986) - is slightly different: as before the runaway trolley threatens to kill five people, but now you are next to a fat stranger on a footbridge above the tracks. The only way to save them is now to push the fat stranger off the footbridge: he will be killed as a result, but he will stop the trolley from reaching the others. Would you

push the man?

You are likely to have already encountered these two dilemmas and your answer was probably “yes” in the former and “no” in the latter.

If those were your answers, your intuitions are the same as those exhibited by most of the tested subjects<sup>1</sup> (Petrinovich et al. 1993; Mikhail 2000; Greene et al. 2001).

These dilemmas have been a puzzle for both moral philosophers, who have tried to explain why it is right to sacrifice one life in the trolley dilemma but not in the footbridge case, and for moral psychologists<sup>2</sup>, who have tried to account for this *explanandum*, namely the phenomenon of the aversion to pushing the fat stranger.

Surely, the most famous and cited account for this phenomenon in moral psychology and neuroethics is that of Joshua Greene (Greene et al. 2001; Greene et al. 2004), who has suggested to call the trolley dilemma “impersonal” while the footbridge dilemma is called “personal”. As it seems, the latter triggers a fast emotional response that restrains us from pushing the fat stranger. Specifically, a moral violation is personal if “it is likely to a) cause serious harm, b) to cause harm to a particular person, c) to do so in such a way that the harm does not result from the deflection of an existing threat onto a different party, while a moral violation is impersonal if it fails to meet these two criteria” (Greene et al. 2004, p. 389; see also Greene 2006).

It is possible to simplify these criteria for personal harm in terms of “ME HURT YOU”. The HURT condition refers to the primitive kind of harmful violations while the YOU criterion demands that the victim be vivid as an individual. The ME condition captures a notion of “agency”, requiring that the action must move in a direct way from the agent’s will. The rationale for distinguishing between personal and impersonal kinds of harm is mainly evolutionary: “personal violence has been around for a very long time, reaching far back into our primate lineage” (Greene 2008a, p. 43).

This explanation, however, has been the target of both methodological and empirical criticisms. As for the first kind of critiques, subjects were ambiguously asked whether actions were “appropriate” or “inappropriate”<sup>3</sup>

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<sup>1</sup> Mikhail (2000) discovered that 19 subjects out of 20 respondents judged the action in the footbridge case “impermissible”, while 18 subjects out of 20 subjects judged the action in the switch case “permissible”.

<sup>2</sup> Although research in neuroethics has mainly focused on our answers to moral dilemmas, there are studies focusing on our responses to social norms violations (Berthoz et al. 2002), to morally offensive versus neutral sentences (Moll et al. 2002) and in distributional tasks (Hsu et al. 2008). This is worth noting, because the use of moral dilemmas has been the target of criticism (e.g. McGuire 2009; Kahane & Shackel forthcoming).

<sup>3</sup> “It’s unclear how subjects construed this request (according to their moral values, what society deems acceptable, or what’s legal), making it difficult to determine whether the

(Schaich Borg et al. 2006; Kahane & Shackel *forthcoming*). Concerning the empirical critique, Greene himself admits that the personal/impersonal distinction is inadequate (Greene 2008b, p. 112) and that it is subject to counterexamples (Kamm 1996; Mikhail 2000; Nichols & Mallon 2006). For example, Mikhail (2000, p. 127) presented subjects with two different versions of the trolley dilemma. As before, the train is rushing toward five people and we can save them by throwing a switch, turning the train temporarily onto other tracks. Fortunately, there is a heavy object on the side track, which will slow the train down and give them time to escape. We are asked whether or not we consider permissible to throw the switch in these two different conditions. In the first case the heavy object is a man, while in the second condition the object is not a person, but there is nonetheless a man standing on the side track in front of a heavy object with his back turned. Most of the subjects judged the action in the first dilemma impermissible (91%) and the action in the second dilemma permissible (87%)<sup>4</sup>. These two cases create problems for Greene's proposal because they cannot be explained by appealing to any version of the personal / impersonal distinction.

The aversion to pushing the fat stranger, however, has been accounted for in various ways: it has been mentioned the fact that the action is intentional (Moore et al. 2008; Cushman et al. 2006; Schaich Borg et al. 2006), that it involves a direct intervention on the victim (Waldmann & Dietrich 2007), a physical contact (Cushman et al. 2006) or a combination of "personal force" and intentionality (Greene et al. 2009a).

However, we can roughly try to separate two different questions<sup>5</sup>:

- a) *which elements do trigger our response?*
- b) *what is the nature of our response?*

In order to explain our *explanandum* properly, we shall focus on b) and explain the nature of our moral judgments according to the literature.

In #2 I will introduce the main available proposals and in #3-5 I will outline

aforementioned study results really reflect the processes that underlie moral judgment" (Schaich Borg et al. 2006, p. 805). Although this kind of criticism is not commonplace in moral psychology, it represents a classical objection in the cognitive psychology of reasoning. In the last couple of decades cognitive psychologists have shown that in certain contexts people tend to reason in ways that violate standard rules in logic and probability theory. However, the interpretation of these empirical results is not straightforward matter: Gerd Gigerenzer and others have argued that in some cases some pragmatic factors can lead subjects to construe the request and interpret certain problems differently from the way experimenters intend. (See Gigerenzer 1996; Hertwig & Gigerenzer 1999).

<sup>4</sup> Mikhail (2000)

<sup>5</sup> I do not assume that this distinction could be neatly drawn. However, it seems to me a useful way of reflecting upon the issue and it is consistent with Greene's claims that "[his] dual process theory could be completely right, even if the personal / impersonal distinction is completely wrong" (Greene et al. 2009b). See #2 for a brief sketch of dual process theories.

the burning empirical and conceptual issues in the neuroethical debate.

## *2. The theoretical framework*

A first answer to question b) is offered by the “pure rationalist” framework, dominant for most of the XX century. According to this view, our moral judgments are the product of conscious reasoning. Recently, however, the rationalist account of moral judgments has been strongly criticized and emphasis has been placed on intuitive and automatic processes, rather than on deliberative and reflexive ones. In this regard, Kern et al. (2009) talk of a “bounded ethicality” mimicking Simon’s notion of bounded rationality, which refers to the presence of heuristics and automatic shortcuts in our decision making. As a matter of fact, such a strictly rationalistic account of action do not seem to be endorsed by the great philosophers of the past, who always left a place for emotions in moral judgment, although in the neuroethics literature it is common to ascribe such rationalistic pictures to deontologists like Kant or to intuitionists like Moore or Ross.

Currently, the theoretical perspectives that seem most entitled to provide a satisfactory explanation of our moral judgments are the “sentimentalist” framework and the “Universal Moral Grammar” (UMG) project. Or we can say, using Hauser’s labels (2006), that the debate in neuroethics is about whether the “Humean” creature (HC) or the “Rawlsian” creature (RC) is the best description of our moral mind.

Concerning HC, the main sentimentalist proposals claim that the “dual process theories” (DPT) are a suitable perspective on moral decision making<sup>6</sup>. The main idea of DPT is that two qualitatively distinct sets of processes are identifiable, some of which are fast, automatic and low effort, while others are slow, analytical, inhibitory and high effort<sup>7</sup>. Such models are typical of the psychology of reasoning and the first instance in decision making is attributable to Stanovich & West (2000; 2003), which talked about automatic and analytic processes labeled respectively System 1 (S1) and System 2 (S2).

Despite this general endorsement, the different sentimentalist accounts diverge in the role attributed to deliberation and reasoning in moral cognition. The pure sentimentalism (PS) suggested by Jonathan Haidt (Haidt 2001; Haidt 2007; Haidt & Bjorklund 2008) maintains that the dual process

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<sup>6</sup> For a theoretical discussion on DPT see Evans & Frankish (2009).

<sup>7</sup> There are some differences in the properties attributed to such set of systems, since DPT is applied in many domains, such as theory of reasoning (see Evans 2007), theory of memory (see Reyna 2004), psychology of social cognition (see Chen e Chaiken 1999) and theory of judgment and decision making (see Kahneman & Frederick 2002; 2005).

framework provides a compelling account for moral cognition and that reasoning does not have a causal role, but rather it merely allows post hoc rationalizations. In brief, moral judgment is the product of quick and automatic intuitions depending on emotions<sup>8</sup> and this approach is thus a kind of intuitionism. Intuitionism in moral philosophy maintains that there are moral truths and that people do not grasp them by virtue of reasoning processes, but thanks to a process more similar to perception. By extension, the intuitionist approach in moral psychology maintains that moral intuitions come first and directly cause moral judgments.

The hybrid sentimentalist model (HS) proposed by Joshua Greene (Greene et al. 2001; Greene et al. 2004; Greene et al. 2008c) shares with PS the thesis that emotions play a key role in our moral cognition, but acknowledges the causal role for reasoning as well, although only in the limited domain of consequentialist judgments. Indeed, Greene proposes that the terms “deontology” and “consequentialism” refer to psychological natural kinds: “here we are concerned with two kinds of moral judgment (deontological and consequentialistic) and two kinds of process (“cognitive” and emotional)” Greene (2008a, p. 41).

At the edge of the sentimentalist framework there is a more moderate claim, made by Shaun Nichols (Nichols 2002; Nichols 2004; Nichols & Mallon 2006), according to which moral cognition depends on an affect-backed normative theory. The normative theory consists of a set of prescriptive rules that codify moral and immoral behavior. This account attributes an important influence to affect, but argues that other accounts that emphasize emotional reactions, namely PS and HS, neglect the role of norms in moral judgments. This account implicates three processes: cost-benefit analysis, checking to see whether an action violates a rule, and an emotional reaction. However, we cannot directly compare this proposal with PS and HS, because Nichols is skeptical about the possibility of obtaining a general model and claims that it is probably unrealistic to expect a tidy processing account of how these factors interact to generate judgments of impermissibility (Nichols & Mallon 2006).

A proposal that departs more radically from the sentimentalist frame is the Universal Moral Grammar (UMG) project (Dwyer 2009; Dwyer 2006; Harman 1999; Harman 2008; Hauser 2007; Hauser 2006; Mikhail 2009; Mikhail 2007), which shares with PS and HS the departure from the pure rationalist framework and an emphasis on both intuitive processes and the incapacity to justify moral judgments (Dwyer 2009; Haidt et al. 2008). Contrary to those models, however, it maintains that emotion-based accounts are in need of an

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<sup>8</sup> It is worth noting that this use of the term “intuition” is not the same as that proper to the historical versions of intuitionism (see Price, Moore and Ross). In fact, they have always used this term to refer to a cognitive act rather than to an emotional act.

appraisal theory: merely noting that some perceived moral violations are associated with emotional responses misses, among other things, the important step of interpreting the stimulus of evaluation. According to UMG, emotions do not have a causal role, because they appear when the judgment has already been formulated and are instead linked to motivation. Thus, the UMG project presents some particular features that set it apart from the previously discussed perspectives.

Mikhail (2000) manipulated the causal structure of trolley cases and found that judgments are sensitive to relatively nuanced distinctions (doing / allowing harm, treating people as means / ends, intentional harm / harm produced as a side effect of good intentions). These structures seem to be shared among people with different cultural and moral background. Therefore, these principles are potentially valid elements of a universal moral grammar analogous to that postulated by the Chomskyan project in linguistics (Chomsky 1981 for a classic treatment; Moro 2008). As in the case of language development, the innate moral grammar, too, provides information that regards the fundamental principles shared by all moral systems and the moral faculty, too, operates unconsciously, quickly and automatically.

Moreover, in order to account for the differences among the morals, UMG refers to the theoretical framework of Principles and Parameters (P&P), developed in linguistics in the 1980s to reconcile the universal grammar (UG) with the variations through strict restrictions in the number and kinds of possible linguistic variables. According to this model, the moral faculty is associated with a set of parameters that can be adjusted in different ways in different contexts, so that a large room for moral diversity is allowed together with the permanence of a common basic structure.

Since PS, HS and UMG are the main proposals available in moral psychology and in the recent field of neuroethics, we can isolate three burning issues<sup>9</sup>:

1) the role of deliberation in moral decision making.

Since PS maintains that moral judgments are the product of our emotions, it also predicts that a) a “weakening” of cognitive processes does not affect our moral judgments and that b) individual differences in cognitive capacities are not associated with different patterns in moral judgments.

2) the role of emotion in moral decision making.

Since UMG maintains that moral judgments are the product of our innate moral grammar, UMG predicts also that a’) manipulation of emotions is insufficient to modify the patterns of moral judgments, b’) lesions in brain areas usually associated with emotions do not modify patterns of moral

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<sup>9</sup> It is worth noting that whereas 1) and 2) are empirical questions, 3) is a much more conceptual issue.

judgments.

3) the linguistic analogy.

In order to establish whether the “Humean” or the “Rawlsian” creature represents the most accurate description of our moral mind, we should not only analyse how strong the evidence in favor of the sentimentalistic view is, but also discuss the depth and soundness of the linguistic analogy.

### 3. *A causal role for deliberation?*

In order to choose between PS and HS and to understand which processes contribute to moral decision making, a crucial question regards the role we should ascribe to deliberation.

Recently, Renata Suter et al.<sup>10</sup> pitted the predictions of these two accounts against each other, presenting subjects with some moral dilemmas where deontological reasoning and consequentialist reasoning would lead to opposing judgments. The main difference is supposed to be the influence of the available cognitive resources. Therefore, the decision process in moral dilemmas was manipulated in five conditions: intuitive judgments were compared to judgments in four conditions that provided more available resources. Deliberative reasoning was fixed at either three minutes, or for an unlimited time, disturbed by a distraction condition for three minutes or manipulated through explicit reason listing. The finding is that the proportion of consequentialist judgments did not differ between conditions. In short, whether participants answered intuitively or engaged in deliberation, the answer patterns did not change. Therefore, it seems, cognitive elaboration does not influence choice in the kind of situations presented. Thus, we should choose PS and reject HS.

However, the results of this study are not uncontroversial. First of all, it is not clear whether they undermine Greene’s claims or not: HS maintains that deontological judgments are driven by fast and automatic emotional processes, but this does not mean that judgments are deontological *because* they are processed with fewer available resources.

In addition to that, there is a great deal of evidence in favor of the causal role of deliberation in moral judgments. Greene et al. (2004) observed the activation of the brain areas linked to cognition when an acceptance response occurred in personal dilemmas, but not when there was a refusal. It has also been noted that a greater activation in these areas occurred in difficult moral dilemmas, finding a correlation between the activation of the cognitive areas

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<sup>10</sup> This study was presented during the SPUDM22 conference in Rovereto (Trento, September 2009): [discof.unitn.it/spudm22/infoPaper.jsp](http://discof.unitn.it/spudm22/infoPaper.jsp)

activation and the acceptance of utilitarian judgments.

Moreover, a confirmation in behavioral data has been sought, specifically by studying reaction times (RT). The interesting finding is that acceptance in personal moral judgments seems to demand longer RT than does refusal (Greene et al. 2001): this weighs in favor of HS, because the finding suggests that the deliberative system sometimes overrides the intuitive emotional response, requiring greater RT.

In addition, some interesting works have recently analysed both the effects of cognitive loads and the impact of our individual differences. Concerning the first kind of studies, since the deliberative system works slowly and relies on scarce processing resources, factors such as time pressure, mental depletion and cognitive load will tend to weaken the deliberative processing in decision making. In the moral domain Greene et al. (2008c) tried to weaken the deliberative system and to evaluate how cognitive load manipulation interferes with moral judgement. In brief, the cognitive load consists of a mental activity imposed on the cognitive resources<sup>11</sup>. It is usually manipulated through a dual task procedure in which subjects have to complete another task while performing the task of primary interest. Thus, the aim of this study was to find direct evidence regarding the causal effect of cognitive processes in moral judgments. They presented participants with high-conflict personal dilemmas and subjects responded under cognitive load and in a control condition. Since HS maintains that utilitarian judgments are driven by controlled cognitive processes while deontological judgments are driven by automatic processes, cognitive load manipulation should selectively interfere with utilitarian judgments. The findings were consistent with this prediction, as cognitive load increased RT with utilitarian judgments (and not with deontological judgments), yielding the predicted interaction between load and judgment type. However, this study represents just a partial confirmation for HS, because the manipulation did not reduce the proportion of consequential / deontological moral judgments.

The other interesting field of study regards individual differences in thinking styles. Although these differences have been specifically investigated in other domains of decision making (Stanovich & West 1998, Stanovich 1999; Stanovich & West 2000), only recently have they been analysed within the moral domain. Bartels notes that “researchers who investigate processes involved in moral judgment tend to neglect the variance attributable to individual differences” (Bartels [2008], p. 408). Some recent studies on

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<sup>11</sup> Cornelissen et al. (2007) showed that people under higher cognitive load offer more in the Dictator Game and Benjamin et al. (2006) discovered that subjects under cognitive load discount delayed monetary rewards at higher rates.

individual differences, however, partially fill this gap: utilitarian judgments are associated with greater need for cognition (Bartels 2008) and working memory capacity (Moore et al. 2008). Therefore, there seems to be a correlation between the deliberative attitude and the exhibition of utilitarian judgments.

#### 4. *A causal role for emotions?*

Recently collected evidence in favor of the thesis that emotions play a causal role covers many fields: experimental psychology, neuroscience, neuropathology. Behavioral data show that highly susceptible participants, hypnotically induced to experience a brief pang of disgust when confronted with a neutral word, see moral transgressions as morally more wrong in vignettes containing the hypnotically targeted word (Wheatly & Haidt 2005). Moreover, participants who watch a humorous clip from *Saturday Night Live*, as opposed to a neutral control clip, report feeling a more positive mood and offer moral utilitarian responses to the footbridge dilemma but not to the trolley dilemma (Valdesolo & DeSteno 2006). In addition, participants responding to moral dilemmas at a dirty desk or when smelling a noxious odor make more severe moral judgments than controls (Schnall et al. 2008).

Also of interest are studies of frontotemporal dementia (FTD), which results from the deterioration of prefrontal and anterior temporal cortex and generates blunted emotion, disregard for others and a willingness to engage in moral transgressions. FTD patients show a pronounced tendency to adopt the utilitarian alternative in personal dilemmas such as the footbridge case (Mendez et al. 2005). With these results in mind, Koenigs et al. (2007) examined the judgments of the VMPC patients<sup>12</sup> for moral and non moral dilemmas. VMPC patients were indistinguishable from controls, except in high conflict dilemmas in which they were more likely to endorse the utilitarian outcome<sup>13</sup>. Greene et al. attribute a utilitarian aptitude to these patients (Greene 2007). However, an experiment proposed by Koenigs and Tranel (2007) renders this interpretation controversial: they analysed VMPC patients' behavior in the *Ultimatum Game*, finding that this pathological population is more inclined to refuse inequitable offers. Such vindictive responses are plausibly described as guided by norms of retributive justice in response to

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<sup>12</sup> A damage in the ventromedial prefrontal cortex (VMPFC) has appeared to rob individuals of their abilities in a strikingly selective way. By far, the most celebrated of such cases is that of Phineas Gage (Damasio 1994).

<sup>13</sup> In a similar vein, also Ciaramelli et al. (2007) claim to show that VMPFC patients are more likely to endorse "personal" moral violations than healthy controls.

fairness and both fairness and retributive justice are paradigmatic examples of deontological considerations.

Further evidence comes from studies on psychopaths, because they show a lack of concern for others, lack the capacities for guilt, remorse and empathy and fail to distinguish moral from conventional transgressions, thus suggesting that emotions provide the developmental source of our moral concepts (Blair 1995; Blair 1997; Blair 2007).

Finally, beyond classical experiments and brain imaging data offered in support of the claim that emotional circuits are engaged in moral tasks, recent landmark studies in the field of neuroeconomics include demonstrations that people's frequent departures from selfish rationality are highly correlated with activity in emotion related areas. More specifically, these studies show that morally charged economic behaviors involve brain areas related to emotion. For example, in the *Ultimatum Game* (UG), when the first player proposes a division that departs drastically from the fair 50%, the second player usually rejects it and the decision to reject is preceded by increased activity in the anterior insula, which is often implicated in emotional activities. Recently it has also been observed that the rejection of unfair offers occurs even if it increases iniquity (Yamagishi et al. 2009). The main aim of this work was to analyse whether social preferences (i. e. for restoring fairness and for punishing norm violators) or moral disgust are the reasons that restrain subjects from accepting unfair offers in the UG<sup>14</sup>.

A major proportion (30-40% compared to 60-70% in the standard UG) of the tested subjects rejected unfair offers even when rejection reduced only their own earnings to 0, while not affecting the earnings of the person which proposed the unfair split. In addition, even when the responders could not

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<sup>14</sup> They investigated the reject of unfair offers in a variant of the UG called the Impunity Game (IG). IG is analogous to UG: it is played between a proposer and a responder and the proposer offers a division of money that the responder can accept or reject. When the offer is accepted, the proposer and the responder receive the amount specified in the proposal. When the offer is rejected, the responder loses whatever money was allocated by the proposer. Although the responder earns nothing, the proposer keeps the money he designated for himself. A rejection of the offer by the responder therefore increases rather than reduces inequality. Thus, a social preference for iniquity aversion cannot explain rejection behavior in IG. The rejection of offers in IG, however, could be explained as an effort to punish the proposer's unfair behavior by conveying anger to the proposer. The possibility of symbolic punishment is eliminated in a version of IG that is *private*. In this version the only difference is that the proposer is not informed that the responder has the option to reject the proposal. Thus, the proposer would never know whether the responder rejects the offer or not. Because the responder knows the proposer does not know whether she accepted or rejected the offer, he is not able to convey the anger directly to the proposer by rejecting the offer as unfair.

communicate their anger to the proposer, the same rate of rejection was observed. Since the rejection of unfair offers that increases inequity cannot be explained by the social preference for iniquity aversion, the explanation based on anger and moral disgust seems more plausible. Stated simply, *“this unexpected finding is consistent with the emotional commitment model”* (Yamagishi et al. 2009, p. 11522). Moreover, the activity in the insula has been found to correlate directly with the degree of concern about equity (Hsu et al. 2008). In addition, when people choose to make constly charitable donations, they show increased activity in emotion and reward areas (Moll et al. 2006; Harbaugh et al. 2007).

These findings collectively seem to support PS and HS, questioning the validity of the UMG project. Indeed, the idea that moral competence has a grammatical structure would be hard to reconcile with the claim that emotions play a causal role in the generation of grammatical intuitions. In order to restore the validity of UMG and criticise PS and HS, Huebner et al. (2009) attempted to deny that the evidence collected is either exhaustive, or adequate. Therefore, they claim that the activity of the emotional circuits provides only correlational data, showing that emotions are associated with moral judgments. Such data (on their own) can never be used to infer causality.

Moreover, the study by Koenigs et al. shows that VMPC patients were indistinguishable from controls except in high-conflict dilemmas, confirming Hauser’s reactions to these findings (Hauser et al. 2008b, p. 178).

Nor behavioral data can establish what role emotions really play, because *“these data fail to isolate the precise point at which emotion has a role in our moral psychology”* (Huebner et al. 2009).

Data obtained from psychopaths, supposedly demonstrating the diachronical necessity of emotions, are considered controversial. As Blair has shown by using age-matched psychopathic and non psychopathic juvenile delinquents, even psychopathic juveniles draw the moral - conventional distinction. Thus, psychopathic juvenile delinquents apparently lose the capacity to distinguish moral from conventional violations over the course of development. Therefore, perhaps the deficiencies in the moral psychology of the psychopath are not a developmental consequence of emotional deficiencies, but rather of antisocial behavior, because a life filled with antisocial behavior can modify the moral psychology of an individual. In addition, a recent study proposed by Royzman et al. (2009) reviewed a number of arguments and findings within the developmental literature that, collectively, pose a serious challenge to the proposition that emotion plays a substantial contributory role

in the construction of the moral domain<sup>15</sup>: In light of their endorsement of an “unsentimental ethics”, their claim that “[the] *strategy is sympathetic with the recent work by the proponents of the moral grammar approach*” is not surprising (Royzman et al. 2009, p. 173).

### 5. *The reality of the linguistic analogy*

Even if the evidence presented in favor of PS and HS does not appear compelling, in order to settle the debate between “Rawlsian” and “Humean” models (Hauser 2006), a different strategy is feasible: we can question the depth and plausibility of the linguistic analogy. More specifically, it has been claimed that UMG is a controversial hypothesis because of some significant differences between moral psychology and linguistics. In this regard, critics question whether the main concepts and arguments deployed by UMG fit the moral domain well (Dupoux & Jacob 2007; Prinz 2008; Sripada 2008).

For example, Sripada (2008) claimed that we should not export the “argument from the poverty of stimulus” (POS) to the study of moral cognition. Stated briefly, the POS arguments claim that there is a problem in explaining how certain cognitive capacity is acquired, because there is a gap between two features of the learning situation: the complexity of the learning target and the resources available to the subject. The evidence of this gap is assumed as evidence in favor of the existence of some structures that fill it. Supporters of the UMG project maintain that the POS argument applied to the moral domain supports the UMG hypothesis, but it is worth noting that assuming evidence in favor of an innate nature as evidence in favor of a grammatical structure is fallacious. To clarify the point, it is sufficient to remember that Rorty’s claim (2006) according to which morality is not grounded in our biology and the claim that moral cognitive mechanisms lack a grammatical structure are quite different. Indeed, many cognitive mechanisms (e.g. color perception) lack a grammatical structure and are nonetheless grounded in our biology.

Beyond this general consideration, Sripada has argued that in the case of language learning it is not possible to teach the correct grammar rules, because, in order to understand them, you must own a grammar. But that is precisely what the child is trying to learn. Instead, in the case of moral

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<sup>15</sup> Kelly et al. (2007) provide grounds for skepticism regarding many conclusions drawn from earlier research using the moral conventional task. This task has been widely used to study the emergence of moral understanding in children and to explore the deficiencies in moral understanding in clinical populations: however – claim the authors – it is not a good assay for the existence of a psychologically important distinction.

learning this is not so: not only are moral norms not so obscure and far from experience as hierarchical tree structures and recursive rules in moral grammars, but the child already owns a language and therefore can be explicitly taught about which are the correct norms. Therefore, learning moral norms differs from learning moral rules in at least two important respects: the learning target is much simpler, and the resources available to the child are much greater. So, even if the POS argument is compelling in the case of language, it cannot be usefully exported to the study of moral cognition.

It has also been suggested that the concepts of the P&P program are not adequate in the moral domain. More specifically, there are two different questions which raise two different kinds of criticism: a) is P&P a suitable perspective on moral cognition? and b) which are the principle of our moral grammar?

Prinz (2008) claims that we should answer “no” to question a). Thus, question b) becomes meaningless. The reason is that if we consider opposing moral systems such as liberalism and conservatism, we are not faced with different settings of the same basic rules, but rather with debates regarding the correct principles to follow. In short, the differences between the existent morals do not seem treatable as parametric variations, without trivializing the notion of parameter.

Moreover, even if we concede that the P&P structure could represent an adequate framework, it remains to be confirmed the principles proposed by the UMG supporters are plausible. For example, Hauser (2006) claimed that “equity” is a universal principle, whose parameters are fixed by local cultures. Nevertheless, the data proposed in favor of the universality and stability of equity between different populations are not uncontroversial. Henrich et al. (2005) investigated subjects’ responses in the *Ultimatum Game*, the *Dictator Game* and the *Public Goods Game* in small scale populations in different cultures, focusing on their compatibility with the selfishness axiom of the economic theory. Although there is no society in which experimental behavior is fully coherent with this axiom, variation observed between groups was much greater than that previously reported. Thus, the universality of equity norms is not uncontroversial and it rests on an open empirical question.

However, the proponents of the moral grammar approach have never claimed that they are already able to answer question b) properly: for example, Harman (2008, p. 350) has recently argued that the discovery of the principles of our moral grammar is surely not straightforward matter<sup>16</sup>.

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<sup>16</sup> “The main difficulty in pursuing an analogy between linguistics and moral psychology is to come up with relevant moral principles beyond the most superficial ones. What are the principles that help to determine the out come when the superficial principles conflict? Such principles, if there are any, might comprise a moral grammar” (Harman 2008, p. 350).

## 6. Conclusion

To return to the question with which I started: What is the nature of our moral judgment? Nobody denies that a growing body of findings demonstrates that moral judgments are linked to emotions. Nonetheless, we are far from stating whether emotions are the cause or the mere consequence of moral judgments and whether deliberation plays a crucial role in moral cognition or not. Moreover, it is not clear how much insight the research programme developed by linguists can provide into morality. Thus, the debate could not be solved so far.

However, a few remarks are still in order. We should not be skeptical about the possibility of arriving at an answer. Indeed, we are allowed to expect that more accurate answers could be soon given by using new experimental techniques and more methodological rigour.

The import of different experimental approaches from psychology and neuroscience maybe represents the best recipe for an experimental moral science<sup>17</sup>. For example, the use of cognitive loads<sup>18</sup> and TMS<sup>19</sup> and the study of individual differences<sup>20</sup> could enlighten the analysis of the nature of moral judgments.

A plea for more rigour could serve our goal as well. Greater consistency in the scales used to measure the role of emotion in moral psychology is urged by Hubner et al. (2009)<sup>21</sup>, while a different concern has been stressed by Kahane & Shackel (*forthcoming*): the battery of dilemmas used in neuroethics often includes several dilemmas which are not even in the relevant domain and thus

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<sup>17</sup> See Greene et al. (2008c) for the use of cognitive loads in moral psychology. See Bartels (2008) and Moore et al. (2008) for the study of individual differences.

<sup>18</sup> See Shiv & Fedorikhin (1999); Ward & Mamm (2000); Skitka et al. (2002); Benjamin et al. (2006); Cornelissen et al. (2007)

<sup>19</sup> TMS (transcranial magnetic stimulation) delivers short magnetic pulses that penetrate the skull and disrupt neural processing in a noninvasive, reversible way. See Van't Wout et al. (2005) for the use of this technique in neuroeconomics. Greene claims that "other manipulations (e.g. transcranial magnetic stimulation applied to dorsolateral prefrontal cortex) may be more successful in altering judgment" and that he "leave[s] this for future research" (Greene 2008c, p 1152).

<sup>20</sup> Stanovich (1999); Stanovich & West (1998; 2000)

<sup>21</sup> "There is little consistency in the scales used to measure the role of emotion in moral psychology: some use a 7- point scale ranging from perfectly OK to extremely immoral, others use a scale asking "how morally wrong" an action is. Yet, others pose a dichotomous question about "acceptability" or "permissibility" and some use a combination of these and other scales within the same study. This makes the comparison across, and even within, impossible"(Huebner et al. 2009, p. 3).

it is improbable that they could capture any natural distinction in moral psychology<sup>22</sup>. However, the involvement of moral philosophers in developing stimuli could obviously serve our purpose (Schaich Borg et al. 2006): it is possible to increase rigour by letting moral philosophers independently classify scenarios directly in terms of their content.

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<sup>22</sup> For example, consider just an example of a personal dilemma: “You are a young architect visiting one of your construction sites with your boss. Your boss is a despicable individual who makes everyone around him miserable including you. It occurs to you that if you were to push him off of the building you are inspecting he would fall to his death and everyone would think it was an accident. It is appropriate for you to push your boss off the building in order to get him out of your life?” As claimed by Kahane & Shackel (forthcoming), “to answer “yes” is not, under any plausible interpretation, to follow utilitarianism”, because “this is an extreme case of amorally following one’s self-interest”.

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