Moral cognition

Individual differences, intuition and reasoning in moral judgment

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Moral Cognition: Individual Differences, Intuition and Reasoning in Moral Judgment

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Abstract

Psychological processes involved in moral cognition were examined in three studies, taking as their starting point the assumption that the cognitive-developmental perspective commonly taken is too narrow and that individual differences and implicit processes need to be taken into consideration. Study I focused on the role of defense mechanisms in moral thinking. A self-report questionnaire was constructed for the purpose of measuring three aspects of morality: moralism, conscience and need for reparation. As hypothesized, a significant positive relationship was found between moralism and the defense mechanism of isolation, particularly isolation of affect, supporting the idea that implicit processes are important for moral functioning. In Study II the effects on moral reasoning of gender, time pressure and seriousness of the issue at hand were investigated in two experiments. In the first experiment, women were found, as predicted from C. Gilligan's (1982) moral judgment model, to be more care-oriented in their reasoning than men. Both time pressure and consideration of everyday as opposed to serious moral dilemmas led to an increase in a justice orientation as compared with a care orientation in moral judgments. In the second experiment, moral reasoning was coded in terms of its being either duty-oriented (duty, obligations, rights) or consequence-oriented (effects on others). Men were found to be more duty-oriented than women, and time pressure to lead to a greater incidence of duty orientation. Study III, involving two experiments, concerned the question of whether moral judgment is primarily based on intuition or on reasoning. In Experiment 1 participants were presented with a classic moral reasoning task (the Heinz story) and with four other tasks designed to put intuition and reason in conflict with one another. On the four latter tasks, but not on the Heinz task, judgments were found to be based more on gut feelings than on reasoning, participants frequently laughing and stating directly that they were unable to give reasons in support of their judgments. This phenomenon, the stubborn and puzzled maintenance of a judgment without supporting reasons, was dubbed "moral dumbfounding." In Experiment 2, reasoning processes were put under pressure by means of cognitive load. High load was found to lead to arguments of lower quality, but the predicted effects of increased dumbfounding and shorter time before giving up the discussion could not be shown. The existence of moral dumbfounding calls into question models in which moral judgment is regarded as being produced solely by moral reasoning. It is suggested that both implicit processes and reasoning should be included in models of moral cognition and that taking account of the interaction between the two is important for an adequate understanding of moral judgment.

Preface

The thesis is based on the following studies:

Study I — Björklund, F. (2000). Defense mechanisms and morality: A link between isolation and moralization. *Scandinavian Journal of Psychology, 41*, 55-61.

Study II — Björklund, F. (2000). Differences in the justification of choices in moral dilemmas: Effects of gender, time pressure and dilemma seriousness. *Lund Psychological Reports, 1*, 1-15.

Study III — Björklund, F., Haidt, J., & Murphy, S. (2000). Moral dumbfounding: When intuition finds no reason. *Lund Psychological Reports, 2*, 1-29.

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Contents

Introduction

Psychological research on morality has been dominated for the past 30 years by rationalist models of moral functioning that emphasize the cognitive-developmental aspects of moral judgment (Lapsley, 1996). In the research leading to the thesis presented here, a major assumption has been, however, that the cognitive-developmental perspective is too narrow to provide an adequate description of why and how people make the moral judgments they make, and that psychologists' models of moral cognition should take both implicit processes and individual differences into account.

There is considerable controversy in psychology concerning the definition of morality and how the concept should be operationalized in research (Blasi, 1990). The view of morality that underlies most modern research in the area, that of Lawrence Kohlberg (1969), implies that morality concerns primarily justice and equality. These are concepts particularly applicable to problems connected with conflicts of interest. Kohlberg's definition has its origins the moral philosopher John Rawls' (1971) theory of justice, which in turn can be linked to the Enlightenment, in particular as represented by Kant (1785/1981). This justice-oriented view of morality is narrow in comparison to the colloquial use of the term, and has been criticized for not including female morality (Gilligan, 1982) or the morality of other cultures (Boyes & Walker, 1988; Shweder, 1991).

In the present thesis, the primary concern is to examine the psychological processes involved in moral judgment, morality being seen as a system of beliefs and values concerning the rightness or wrongness of human acts. However, rather than studying norms and values as such, attention will be directed at mental processes and personality differences

in this connection, as few assumptions as possible being made concerning normative aspects of morality (what we *ought* to do or think). Since widely differing aspects of moral functioning will be examined, the specific operationalizations used will differ for the various studies. Summaries of the separate studies are presented after the review of relevant research on moral psychology that follows.

Moral Judgment Research: Kohlberg's Theory

Lawrence Kohlberg was one of the first American psychologists to exploit Jean Piaget's (1932/1997) groundbreaking research on moral development, which he developed further in his cognitive-developmental theory of moral judgment, for example by extending it to include adults. Kohlberg's theory can be regarded as the major contribution of the psychology of morality to the cognitive revolution. A main argument against the applicability of behaviorism was that moral development cannot be explained without reference to underlying mental structures that are transformed by experience. In the research he conducted, Kohlberg made use primarily of interviews, presenting participants with hypothetical moral dilemmas followed by probe questions concerning the measure of interest; the level of sophistication of moral reasoning (see Colby & Kohlberg, 1987).

Kohlberg (1969) claims that the capacity for moral reasoning develops in a hierarchy of six qualitatively different and gradually more sophisticated stages that can be divided into three levels; *preconventional*, *conventional* and *postconventional*. Moral reasoning at the preconventional level is characterized by a concrete and immature world view, which is scarcely surprising since most persons at this level are children. At stage 1, reasoning is characterized by the idea that one should be obedient to

authority and avoid acts that lead to punishment or physical damage, whereas at stage 2 reasoning is guided by rules such as "tit for tat" or "an eye for an eye", where one serves one's own interests and lets others do the same, helping others if and only if they help oneself. At the conventional level of moral reasoning (stages 3 and 4), one has a certain amount of understanding of the fact that rules and norms are prerequisites for a society to function, and also a greater ability to perceive things from another person's perspective. As its name indicates, most people eventually reach this level. At stage 3, social agreements that override individual interest, such as loyalty and keeping promises, are considered important, but the perspective is still narrow, including mainly simply family and friends. At stage 4, however, the scope is widened and a sense of the importance of laws and rules as a means of protecting members of society is developed. Still further cognitive development, particularly the improvement in abstract thinking which occurs at puberty, leads some people to reach the postconventional level, at which one is able to reflect on the foundations of social order and to then follow self-chosen moral principles. Stage 5 thinking revolves around the idea that moral values can be either relative or absolute, and that the absolute values, such as justice and freedom, override the relative. At stage 6, only actions that are in accordance with the abstract, coherent and universal moral principles of justice and fairness that one has chosen to embrace are considered morally right.

In the original formulations of the theory, the six stages were held to have universal validity. However, since Kohlberg failed to find empirical evidence for the sixth stage, it was retained as simply a hypothesis in subsequent versions. Moral models such as Ghandi and Mother Theresa served as examples of persons using this supreme form of moral

reasoning. Hundreds of studies have tested Kohlberg's theory and there is an abundance of support for the developmental aspects of it (Lapsley, 1996), yet critical voices have been raised concerning the claim of its universal validity (Kohlberg, 1971), and above all against the claim that there are no gender differences in moral reasoning (e.g. Kohlberg, 1984).

Gilligan's criticism

Carol Gilligan, a former student and collaborator of Kohlberg's, explored systematically the findings of gender differences in developmental psychology, and in 1982 published her landmark book "In a Different Voice" where she claims that female moral reasoning is different, but not inferior, to that of men, and that Kohlberg's theory fails to account for such differences, the test instruments derived from it even classifying female reasoning with that of children. Gilligan argues that, as an effect of the two genders being socialized in different ways - boys' growth being primarily concerned with separation and individuation and girls' growth primarily concerning attachment and relationships - men come to view themselves as independent agents, regulated only by rights and duties, whereas women come to perceive themselves as part of a network of social relations in which the nodes are mutually responsible for one another. Thus, women consider care, kindness and relationships to be more important than the typical male virtues of justice and fairness. According to Gilligan (1982), these gender differences in self-image affect moral reasoning in the sense of men striving for fair solutions to moral problems, or so-called justice-oriented reasoning, and women striving towards being caring and kind (care-oriented reasoning).

Gilligan's claims raise several interesting empirical questions. First, what evidence is there for Kohlberg's theory being biased against women? A

natural way of finding an answer to this question would be to examine whether women score lower than men on Kohlberg's test instruments. Reviews in this area clearly suggest there to be no differences, as the mean reported effect sizes of gender on moral reasoning generally are very small (Bebeau & Brabeck, 1989; Lapsley, 1996; Walker, 1984, 1991). However, if Gilligan is correct in her assertion that men and women use two qualitatively different moral reasoning orientations, could it be that Kohlberg's test instruments, which were only designed to measure justice-oriented reasoning, are inappropriate for the detection of differences in the relative use of these different forms of moral reasoning? So it seems, and new measures have been developed that take both types of reasoning into consideration. The results obtained indicate care-oriented reasoning to indeed exist and to be distinguishable from justice-oriented reasoning (Bebeau & Brabeck, 1989). However, although reviews indicate that most people use both justice-oriented and care-oriented reasoning (Bebeau & Brabeck, 1989; Lapsley, 1996; Puka, 1994), some studies find gender differences whereas others do not. Methodological diversity complicates the picture further. Gilligan and her collaborators often conducted interviews concerning real-life rather than hypothetical moral problems, and in these and most other studies that report gender differences participants were asked to construct and reason about a moral dilemma that was based on a situation they themselves had experienced. Walker, de Vries and Trevethan (1987) argue that findings of gender differences in studies of this type can be explained simply on the basis of differences in the types of moral problems involved or of preferences for discussing dilemmas of a certain type, rather than on the basis of actual differences in moral reasoning. It is also of interest to note in this context that the content of dilemmas has been shown to be a better predictor of

moral judgment strategy than gender, dilemmas of a personal nature primarily eliciting care-oriented reasoning and impersonal dilemmas leading mainly to justice-oriented reasoning (Walker et al, 1987; Wark & Krebs, 1996). To conclude, Gilligan seems to have succeeded in broadening the moral domain to include care-oriented moral reasoning. However, although men and women alike appear capable of using both justice-oriented and care-oriented reasoning to solve moral dilemmas, there is no clear answer as yet to the question of whether the relative use of the one as compare to the other moral reasoning orientation is related to gender.

Psychoanalysis: Defense Mechanisms and Morality

Although most influential models within the present-day psychology of morality are focused on reasoning, there are fruitful alternative perspectives, that are concerned with emotions (Hoffman, 1991; Kagan, 1984) or with social reinforcement and self-regulatory mechanisms (Bandura, 1986, 1991). However, the frequent avoidance within academic psychology of being associated with psychoanalytic theory has left many of the hypotheses derivable from that theory untested, despite recent reviews of social psychology showing various novel concepts there to be more or less identical with basic psychoanalytical concepts (Baumeister, Dale & Sommer 1998; Paulhus, Fridhandler & Hayes, 1997). One such concept, defense mechanisms, was introduced already by Freud (1894/1962) who described them as unconscious strategies designed to protect the ego from anxiety. Modern definitions of the term tend to be broader and less focused on anxiety, such as "..mental processes that operate unconsciously to reduce some painful emotion" (Paulhus et al, 1997, p. 543), or "..cognitive and interpersonal patterns that develop in the context of

relations with others, with a primary function being the protection of the self and self-esteem" (Cramer, 1998, p. 887). The extent to which an individual utilizes defense mechanisms is often regarded as a personality variable (Paulhus et al, 1997) and has been found to be related to such widely differing traits as anxiety level, intellectual ability, locus of control, and attitudes toward the self, as well as to occupational success and psychopathological diagnosis (Cramer, 1991).

Although it has been suggested that defense mechanisms are related to moral functioning (Shapiro, 1981; Haan, 1977), the evidence thus far is restricted to developmental studies indicating defense mechanisms to be obstructive to moral reasoning whereas coping strategies enhance it (Haan, 1985; Hart & Chmiel, 1992). Apparently no studies have related specific defense mechanisms to different aspects of moral thinking, although relevant predictions can be made in terms of traditional psychoanalytic theory. For example, Fenichel (1946) argued that the defense mechanism of *isolation*, the creation of an imaginary gap or barrier between a threatening thought and the self, is related to moralism, defined as a predisposition to evaluate everything in terms of right or wrong. Fenichel observed that extensive use of isolation, a characteristic of persons with an obsessive-compulsive personality disorder, appeared to result in rigid and dogmatic thinking, with moralistic thinking as a possible further extension of this rigidity. Another characteristic of obsessive-compulsive persons is a strong conscience, harsh self-punishments being evoked by the transgression of moral rules, sometimes leading to depression (Shapiro, 1965). Interestingly, the self-punitive aspect of conscience appears to be linked with the defense mechanism of *introaggression*; clinical studies showing introaggression to be characteristic of depressive, self-accusing persons who perceive the causes of evil to

originate in themselves (Kragh, 1985; Smith, Johnson & Almgren, 1988). In addition, psychoanalytic theory suggests that an unusually strong motivation to behave prosocially can be explained in terms of the defense mechanism of *reaction formation*, which means one's own unacceptable and anxiety provoking feelings and impulses being controlled by behavior patterns directly opposed to them (Fenichel, 1946). Clinical cases in which clients with a history of solid kindness suddenly turn to being inordinately aggressive, possibly as sadistic impulses break through their ego defense, are often regarded as supporting the reaction formation hypothesis, yet little empirical testing of this has been performed to date (Weinberger, 1998). To sum up, interesting hypotheses concerning the influence of implicit processes on morality can be derived from psychoanalytic theory. Since the concept of defense mechanisms has been avoided in the mainstream psychology of morality, however, these particular ideas appear as yet to be unexplored.

Intuition in Moral Judgment

In rationalist models of moral cognition (e.g. Kohlberg, 1969; Kohlberg, Levine, & Hewer, 1983; Piaget, 1932/1997; Turiel, 1983) moral judgment is described as the result of a reasoning process, its level of sophistication being the main measure employed in research. As a consequence of the strong focus on slow, effortful, conscious, and verbalizable reasoning processes, the possible influence of implicit processes on moral judgment has been left virtually unstudied. This is notable, for one thing since participants in moral judgment studies often themselves mention the immediate gut feelings they experience when someone performs a blameworthy or a praiseworthy act (Haidt, Koller & Dias, 1993; Walker, Pitts, Hennig & Matsuba, 1995). The idea that such

gut feelings are important in moral judgment is far from new, the moral philosopher David Hume reasoning along these lines already in "A Treatise of Human Nature" (1739/1992). Observing that "Nothing is more usual in philosophy, and even in common life, than to talk of the combat of passion and reason, to give the preference to reason, and to assert that men are only so far virtuous as they conform themselves to its dictates" (p. 413), Hume challenged the rationalist theories of his time by asserting that passion (viz. intuition, or gut feelings) drives moral judgment: "In order to shew the fallacy of all this philosophy, I shall endeavour to prove *first*, that reason alone can never be a motive to any action of the will; and *secondly*, that it can never oppose passion in the direction of the will" (p. 413).

Although experimentally untested to date, recent neuropsychological findings indirectly support Hume's idea of the primacy of intuition in moral judgment. For example, LeDoux (1993) has demonstrated that information is evaluated emotionally in a particular network in the brain before it reaches the neocortex to be processed consciously. Similarly, Damasio's (e.g. 1998) research has shown there to be *somatic markers*, quick unpleasant gut feelings that alarm us of possible negative outcomes and perform a critical function in social judgment, evaluating certain information before it is processed systematically in terms of declarative knowledge. Initial work in the moral domain has provided comparable results; Batson, Engel and Fridell (1999) succeeded in manipulating their participants' value judgments by providing false somatic-marker-related feedback.

Further indirect support for Hume's ideas comes from cognitive psychology, implicit processes there being found to play an important role in naturalistic decision making (Klein, 1998), especially among

experts, who often rely on hunches which they have rather than on the application of explicit rules. Klein's research points to a plausible cognitive explanation of how intuition is elicited, namely through the nonconscious matching of sequences of information with familiar implicit patterns, this matching generating quick evaluations of possible outcomes that can serve as a basis for judgments or decisions. Such patterns can be learned implicitly (Stadler & French, 1998). This may be true for morality too; some evidence for Reber's (1993) idea that societal norms and mores can be learned implicitly rather than through explicit education and upbringing has been put forth of late (Lewicki, Czyzewska & Hill, 1997). The research briefly reviewed here in no way corroborates Hume's radical claim that "Reason is, and ought only to be the slave of the passions, and can never pretend to any other office than to serve and obey them" (1739/1992, p. 415), but it does represent a promising point of departure for further investigation.

Concluding Remarks and Aims of the Present Thesis

The cognitive-developmental perspective on morality has proved to be remarkably fruitful, deserving its prominence in moral psychology. However, one can argue that it is too narrow to provide a full and varied description of moral thinking, and that part of this problem originates in the neglect of studying concepts not directly related to reasoning. The aim of the research presented next was to investigate various promising alternative aspects of moral cognition, the main research questions asked being the following:

- Is moral judgment based primarily on intuition or on reasoning?
- How does time pressure affect moral judgment?
- Does the seriousness of moral issues affect judgment strategy?

- Do men differ from women in moral judgment orientation?
- What role do defense mechanisms play in moral cognition?

Summary of the Empirical Studies

Main features of Study I

The aim of Study I was to investigate the relationship between unconscious defensive processes and morality. Three hypotheses concerning positive relationships between specific defense mechanisms and various aspects of morality that were derived from classical psychoanalytic theory (Fenichel, 1946) were tested empirically. One hypothesis was that moralism (an exaggerated need to evaluate persons and actions in terms of right or wrong) is related to the defense mechanism of *isolation*, both moralism and isolation involving the attempt to separate good from evil, and both mechanisms being common in persons with an obsessive-compulsive personality disorder (Shapiro, 1981). A second hypothesis, based on findings from related areas of research, was that conscience (a strong sense of what is right and wrong) is related to the defense mechanism of *introaggression*. A third hypothesis was that a strong motivation for providing reparation is related to the defense mechanism of *reaction formation*.

Method

A questionnaire measuring the three moral constructs of interest - moralism, conscience, and reparation - was developed and was subsequently validated against the relevant "Big Five" variables (NEO-PI, Costa & McCrae, 1985). Satisfactory reliability and validity were obtained. The degree of moralism of the participants (54 male students of Lund

University) was measured by their responses to items such as "I think I'm more strict in asking myself what is right and wrong than others", whereas their strength of conscience was assessed by their responses to such guilt-related items as "I know at once when I've done something wrong", and their inclination to repair damage that one has caused by responses to such items as "If by mistake I hit a car in a parking space, I contact the owner and compensate him for the damage done".

Defense mechanisms were measured using the group version of Kragh's Defense Mechanism Test (DMT, Kragh 1985), in which participants are presented with a threatening stimulus projected on a screen in two series of very short and successively longer exposures (1/50 second to ½ second). Results of the DMT were coded by two trained raters, using Kragh's (1985) coding manual, certain systematic biases in perception being taken as expressions of defense mechanisms.

Results and Discussion

As hypothesized, a significant positive relationship was found between moralism and isolation, particularly isolation of affect, which supported the idea that implicit processes may be important for moral functioning. Neither the prediction of a positive relationship between conscience and introaggression, nor that of a positive relationship between reaction formation and a motivation to do good was supported, however. The fact that the sample consisted exclusively of male university students and the fact that classical psychoanalytic theory has little to say about female morality except that it differs from that of males, however, calls into question the generalizability of the results obtained. This was one reason for specifically investigating gender differences in Study II.

Main features of Study II

Are there gender differences in moral reasoning? Most reviews suggest there to be none (Lapsley, 1996; Walker, 1984), but critics claim that this may be due to the vast majority of studies having used Kohlberg's moral reasoning tests (e.g. Colby & Kohlberg, 1987). These traditional measures, although capable of capturing the justice-oriented morality characteristic of males, can be considered inappropriate for studying the care-oriented morality of females, which focuses on the maintenance of relationships and attention to the other's needs rather than on issues of justice, equality and fairness (Gilligan, 1982; Lyons, 1983). Thus the issue of gender differences in morality is still an unsettled one. Investigating it in this study, it was predicted that men would be found to be justice-oriented and women to be care-oriented in their moral reasoning.

The specific theme of a moral dilemma can affect the kind of moral reasoning used to solve it (Wark & Krebs, 1996). For example, impersonal and philosophical moral dilemmas have been shown to primarily elicit justice-oriented reasoning. The present study tested a related hypothesis, namely that serious moral issues and less serious ones are processed differently. It was predicted that only when faced with serious moral dilemmas we are motivated to engage in systematic reasoning concerning the possible consequences of our decisions for other persons.

Although modern life is stressful to most people and many decisions have to be made without sufficient time for reflection, our present knowledge of how time pressure affects reasoning, let alone moral reasoning, is restricted (Maule & Svenson, 1993). Since it was assumed that sufficient time for information processing is a prerequisite for moral reasoning about the consequences of one's acts, it was hypothesized that

time pressure increases the use of justice-oriented justifications in moral decision making.

Experiment 1

Method

On the basis of the results of a pilot study, 6 serious and 6 everyday moral dilemmas were chosen and were tape recorded for presentation to the participants in the actual experiment. Seventy-two undergraduate students of Lund University (46 female, 26 male) were randomly assigned either to a short time (65 s) or a long time condition (180 s). Participants were instructed to make a judgment of what action to take in each of the dilemmas, and to justify the judgment thoroughly in writing. Two independent coders, blind to participants' gender and to the experimental condition, coded the data using Lyons's (1983) coding schedule for justice-oriented versus care-oriented moral reasoning, obtaining an acceptable interrater reliability ($r = .85$).

Results and Discussion

A clear gender difference was found, women engaging in care-oriented reasoning to a greater extent than men, as predicted by Gilligan's (1982) theory. However, the difference was a matter of degree rather than of kind, both women and men showing themselves capable of using justice-oriented and care-oriented reasoning alike, both across and within dilemmas.

Also, as hypothesized, the judgments made of the serious moral dilemmas were more care-oriented than those of the everyday ones. Possibly care-oriented reasoning is experienced as being more effortful than justice-oriented reasoning, requiring a greater amount of motivation. The

effects of time pressure were also in the predicted direction, limited time for reasoning appearing to force participants to justify their judgments by the use of schematic justice-oriented reasoning.

Experiment 2

The aim of Experiment 2 was to investigate further the effects of gender and time pressure on moral reasoning that had been found in Experiment 1, using a broader sample in terms of age and occupation, and an alternative method of coding moral reasoning. Duty-oriented reasoning, in which duties, obligations and rights are the central themes, and consequence-oriented reasoning, in which the focus is on the possible effects of a decision on other people, was coded for, predicting that men would justify their judgments primarily in terms of duties and that women would justify them in terms of consequences, and furthermore that time pressure would lead to an increase in duty-oriented reasoning.

Method and Results

Eighty participants, ranging in age from 19 to 87, were recruited via posters and visits to a construction company and to two homes for the elderly in southern Sweden. The experimental design was similar to that of Experiment 1, but the stimuli consisted this time of only six moral dilemmas, four of which had been used in the previous experiment. Two raters, blind regarding participants' sex and the experimental condition involved, coded the responses to the dilemmas in terms of duty versus consequence orientation, obtaining an interrater reliability of $r = .79$. The major findings were that the men justified their judgments in terms of duties and rights to a greater extent than the women did, and that having

limited time to process the relevant information furthered duty-oriented justifications of moral judgments.

General Discussion

Both experiments in Study II revealed clear gender differences in moral reasoning in the direction predicted by Gilligan's (1982) moral judgment model, supporting the hypothesis that there being so few findings of gender differences in moral reasoning is due to most researchers having used instruments incapable of discovering them. In addition, time pressure was shown to increase the use of justice- and duty-oriented reasoning. This finding is perhaps best explained in terms of the more effortful reasoning that thinking of care and of consequences requires being a more time-consuming activity than reasoning of a justice- and duty-oriented type is, and that processing of the latter type can compensate for that of the former type when we are under time-pressure, mental load, or are not strongly motivated to engage in systematic analysis of the possible consequences of our decisions. Similar findings have been obtained in social psychology, where it is often claimed that many real life judgments and decisions are made automatically, perhaps intuitively (Wegner & Bargh, 1998). It has also been argued that justificatory reasoning of the type investigated in the present study represents ex-post facto rationalizations of such quick and intuitive judgments (Haidt, 2000; Nisbett & Wilson, 1977). Drawing on these lines of reasoning, a study aimed at investigating the importance of intuition versus reasoning processes in moral judgment was planned and performed.

Main features of Study III

Is moral judgment based primarily on reasoning or on intuition? Psychological models of moral judgment have long assumed that reasoning causes judgment, but in related fields of social psychology more modern models that assume the primacy of implicit cognitive processes have been developed recently (Greenwald & Banaji, 1995; Wegner & Bargh, 1998). It was hypothesized, inspired by David Hume's (1739/1992) radical claim that "Reason is, and ought only to be the slave of the passions" (p. 415), and with the support of certain social psychological research as well as of the finding that persons rarely can account for the causal factors behind their judgments despite their claiming to be able to do so (Nisbett & Wilson, 1977), that for some issues moral judgment is made based on intuition, reasoning serving simply to produce ex-post facto explanations of it.

Experiment 1

Method

Eighteen female and 13 male undergraduate students at the University of Virginia were presented with the Heinz dilemma (of whether Heinz should steal a drug in order to save his sick wife) from Kohlberg (1969); two taboo-related moral intuition tasks (the one concerning cannibalism of the body of a man who has donated his body to science, and the other concerning consensual incest between two siblings) that were designed to elicit strong emotional reactions despite no one in the story being directly harmed; and two behavioral tasks (to drink juice in which a cockroach had been dipped, and to sell one's soul to the experimenter), both of which were predicted to yield responses similar to those obtained on the moral intuition tasks – namely a quick intuitive reaction that the act is

wrong or undesirable, but difficulties in reasoning why it is wrong when challenged by the experimenter, who was playing "the devil's advocate". Discussion of each story was video-recorded, and followed by a self-report questionnaire asking for participants' level of confusion, irritation and confidence in judgment.

Results and Discussion

For the taboo-oriented stories and the behavioral tasks, participants reported relying more on gut feelings than on reasoning, the reverse being true for the Heinz story, participants there being more sure of their judgments and rarely saying that they were unable to explain their judgments. Coding of the videotapes showed that in response to the moral intuition stories participants more frequently laughed or declared that they could give no reasons in support of their judgment than in the Heinz story. The stubborn and puzzled maintenance of a judgment without supporting reasons was dubbed "Moral Dumbfounding", and was considered to be a challenge to traditional moral judgment models.

Experiment 2

The aim of the second experiment was to test further the idea that moral judgment can be based on intuition rather than reason, doing so by putting reasoning processes under pressure by means of a cognitive load. If reasoning is an ex-post facto process, a cognitive load should lead to less complex and less persuasive arguments, a greater amount of dumbfounding, and to participants' "giving up" the discussion more quickly, the time it takes to come to an initial judgment being unaffected.

Method

Thirty female and 19 male undergraduate students at the University of Virginia were randomly assigned to either a high-load condition (holding a 5-digit number in one's head) or a low-load condition (holding a 1-digit number in one's head), and were asked then to make moral judgments of four stories, two of which were taboo-oriented, designed to induce a quick gut feeling of condemnation (the consensual incest story from Experiment 1, and a story about a person who produces and uses LSD for recreational purposes), and two stories that required participants to weigh the interests of the persons involved (the Heinz dilemma, and a story about a man who sells his possibly defective car to a naive neighbor). Presentation of each story was followed by the same dumbfounding procedure as in Experiment 1, where the experimenter challenges the arguments put forth by the participant.

Results and Discussion

High cognitive load led to lower argument quality for each of the stories, but the predicted effect of an increase in dumbfounding and a shorter time until giving up the discussion was not obtained. The main findings of Experiment 1 were replicated, however. Participants made their judgments for the incest story on the basis of quick gut feelings rather than of careful reasoning about the facts involved, dropped a larger percentage of their reasons when cross-examined, and showed more signs of dumbfounding, such as making unsupported declarations ("It's just wrong!"), and explicitly admitted that they could give no reasons for their judgments.

General Discussion

Psychological models of moral cognition have traditionally emphasized the primacy of reasoning, perhaps as an effect of the stimuli employed (such as the Heinz dilemma) requiring participants to reason about justice and rights rather than making them as open for intuitive thinking as other kinds of moral issues (such as the incest story) would. The results of the present study, in particular the occurrence of the dumbfounding phenomenon itself, call into question the generalizability of these rationalist models and provide support for the hypothesis that reasoning is often a post-hoc activity which serves to justify to others the judgments one has already made intuitively. Although Hume's claim that moral judgment is *always* made intuitively appears too strong in light of the present data, recent findings in social psychology (Wegner & Bargh, 1998) together with neuropsychological models that provide a basis for the temporal precedence of gut feelings as compared to reasoning (Damasio, 1998; LeDoux, 1993), suggest that both intuition and reasoning processes should to be included in a complete model of moral judgment.

Summary of Results, Discussion and Conclusions

In the present thesis certain alternative perspectives to mainstream ideas regarding moral cognition were employed, ones that focused on implicit processes and individual differences in moral judgment. The question of whether men and women differ in moral judgment orientation was answered in the affirmative. The men used a justice-oriented approach to a greater extent than the women did, just as Gilligan's (1982) moral judgment model predicts. The fact that relatively few findings of this sort have been reported before raises methodological issues, such as

Gilligan's suspicion that the traditional test instruments used have been insensitive to the care-oriented moral reasoning she considers characteristic of women. Continuously ongoing methodological scrutinizing of this kind is an important sign of the maturing of this area of research. The hypothesis behind the finding presented here of serious moral issues leading to increased use of care-oriented reasoning is also one of basically methodological origin, although it has theoretical implications regarding the conditions under which specific processes are activated.

The finding of an effect of time pressure on moral judgment orientation can be seen as one of the major contributions of the research reported here. In psychological research on morality, especially that of developmental orientation, social interaction factors are varied to examine how judgment is affected, whereas varying factors such as time pressure and mental load is much less common. Further research of this sort could contribute considerably to an understanding moral information processing.

Regarding the role of defense mechanisms in moral cognition, the finding of a link between isolation and moralization suggests that implicit processes matter for moral thinking. It also demonstrates how testable hypotheses can be generated from psychoanalytic theory. Although for the most part ideas contained there may best serve more as a source of inspiration than of precise elements to be used in present-day models of social cognition, the basic applicability of certain of the ideas of Freud and his followers should be acknowledged. In the view of the strong impact of psychoanalysis on clinical psychology, the humanities, and public debate, it is important to evaluate psychoanalytic theory empirically and to communicate the results.

The question of whether moral judgment is based primarily on intuition or on reasoning was perhaps the most difficult to answer. The moral dumbfounding phenomenon that was found however indicated intuitions to be important for some types of moral judgment. Implicit processes are notoriously elusive, and highly sophisticated experimental paradigms must often be developed in order to investigate them successfully. The indirect method for studying intuition employed here was relatively easy to administer, however. The dumbfounding technique can be developed further, programming a computer to argue with the participant and using questionnaires of a flowchart type being possibilities here. One could also apply the dumbfounding technique to other areas, such as through asking a person to justify his/her belief in free will. Also, the ease at which a person becomes dumbfounded could be regarded as a personality variable, possibly indicating a person's overall reliance on gut-feelings in judgment. Taken as a whole, the findings reported here suggest that both implicit processes and reasoning should be included in models of moral cognition, and that the interaction between the two may be important for an adequate understanding of moral judgment. In the following, further thoughts on dual-processes in morality are presented.

Dual Processes in Moral Cognition

As is obvious from the wording, dual process models propose two separate processes that are qualitatively different from one another. One of the processes is usually described as slow, effortful and conscious, and the other as fast, effortless, and nonconscious. Although similar dualisms have been presented earlier, such as primary and secondary processes in psychodynamic theory and passion and reason in ethics and other philosophical debates, there is certainly a trend in modern social psychological

theorizing to attempt at describing both kinds of processes and the way they interact under different conditions. The descriptions given of these processes (or processing modes) are very similar across models. Although they have different names, all of them will be referred to in the following as systematic and associative processes, respectively.

Systematic processing

Systematic processing, which is considered to be controlled, effortful and slow, is represented in moral psychology by justice-oriented reasoning as described in Kohlberg's (1969) moral judgment model. Systematic processing draws on symbolic representations that are structured and interrelated by the laws of language and logic, processing being sequential and generally accessible to consciousness (Smolensky, 1988). Further, systematic processing usually leads to a higher level of perceived validity than associative processing, mainly because we are more likely to trust arguments and judgments based on logical reasoning than those based on intuition (e.g. Petty, Priester, & Wegener, 1994). According to Levine, Resnick and Higgins (1993), it is the broad cultural sharing of the rules of logical inference that generates this feeling, validity ultimately, they argue, stemming from consensus. However, associative processing can also be very compelling, as in the case of metaphorical thinking (Johnson, 1993; Lakoff & Johnson, 1980). Epstein (1991) even suggests that appeals to associative thinking are more persuasive than rational arguments, a claim that appears to be true, in particular, for areas such as those of food preference and aesthetic judgments, where we simply know what we like or dislike.

Associative processing

Many of the qualities of systematic process that have been described have their counterparts in associative processing (Table 1). Compared with systematic processing, associative processing is quick and relatively effortless (Sloman, 1996). Since it operates preconsciously, we generally are only aware of its results, such as in the intuitions or hunches we have about what is going to happen or how to act in a particular situation.

Table 1

Features of the two Processing Modes

Systematic	Associative
serial processing	pattern matching
algorithms	heuristics
slow	fast
effortful	effortless
conscious	nonconscious
verbalizable	preverbal
explicit rules	senses and hunches
"cold cognition"	emotional involvement

Whereas it is relatively easy for a person systematically processing a moral problem to report what is going on in his or her mind at a given moment, a person who is processing a moral problem associatively seldom knows exactly what it was that elicited the intuitions that were experienced. There is ample evidence, however, to show that people are very likely to make up *post hoc* theories of causality that seem plausible to themselves and to others (Nisbett & Wilson, 1977; Nisbett & Ross, 1980;

Wason & Evans, 1975). Haidt, Koller and Dias (1993) obtained similar findings in the moral domain in testing children's intuitions regarding harmless taboo stories. Translated to a dual process perspective, this seems to imply that although we may think that we made a judgment on the basis of systematic processing, the judgment could in fact be purely intuitive and be based on associative processing.

Activation of processes

What makes us use associative processing instead of systematic processing or vice versa in a specific situation? According to Sloman (1996), associative processing is elicited by a specific cue available in the current situation, a cue that provides automatic access to the knowledge or affective reactions, stored in memory, that have become associated with it. Since different contexts provide different cues, associative processing is context-sensitive. Through pattern matching, information that has been repeatedly linked to an object in the past is automatically brought to mind whenever we perceive or think about the object again. The activation of the information is immediate and, once activated, the knowledge that is associated has the potential for affecting both judgments and behavior. According to some theorists, such patterns of information are stored in a separate associative memory system that can learn an entire set of characteristics that co-occur frequently, and can then retrieve or reconstruct it even when only parts of the set are perceived (Schachter & Tulving, 1994).

Research shows that type of processing used is not simply a matter of choice. Such situational circumstances as time-pressure and factors that increase mental load, for example, may lead to associative processing (Smith & DeCoster, 1999). Systematic processing is more easily disrupted

by distraction or interference than associative processing is. In real life, this has the effect of the responses we make when we are busy or distracted being likely to have been processed associatively. It is thus more adequate to speak of the likelihood of use of the one of the other mode than of the preference for the one or the other.

A mathematical problem that requires careful and systematic analysis can hardly be solved intuitively unless the problem solver is very familiar with the specific type of problem at hand. Some decisions, however, such as choosing a main course from a menu, appear to be open to both kinds of processing. A formulation in the menu may put us in the mood for having some particular type of food at that moment, whereas there may be dietary or economic concerns involved, which would tend to elicit systematic processing. In the moral domain, the content of a moral dilemma, for example, has been shown to guide the kind of moral reasoning people use to solve it, such that issues that involve conflicts of interest elicit primarily a justice-oriented reasoning, whereas situations in which someone is suffering generally lead to reasoning in terms of care (Walker, 1991; Wark & Krebs, 1996). Still other kinds of moral issues, such as moral taboos regarding sexual deviance, tend to elicit quick gut feelings of condemnation rather than eliciting systematic reasoning (Björklund, Haidt & Murphy, 2000). In some situations, such as in the case of picking a course from a menu, the associative and systematic processes may come into conflict. Which process overrides the other may then be affected by the decision maker's degree of inclination to rely on the one process as opposed to the other. Some persons usually pick spontaneously what they like, whereas others reason systematically before concluding what they want. This appears to be a relatively stable personality trait (Epstein, Pacini, Denes-Raj, & Heier, 1996). Similarly,

Cacioppo, Petty and Morris (1983) have shown that the degree of preference for systematic thinking, which they term Need for Cognition, if sufficient time and cognitive resources are available, can also activate systematic processing.

Research on social cognition indicates, however, that systematic processing is only used when people give the issue at hand full consideration in terms of both attention and intention (Wegner & Bargh, 1998). Since systematic processing of moral issues is time-consuming, situations in which there is insufficient time for systematic processing to be carried out should force us to rely primarily on associative thinking, that is on intuition or on heuristic moral principles. If motivation is a prerequisite for systematic processing, it should be more likely for associative processing to be used in everyday (less serious) moral decisions than in more serious ones, for which the possible consequences might involve injury or death, for example, and which should be motivating enough to elicit systematic processing. Other examples of highly motivating situations are those that concern threats to our moral self image (the ought self, Higgins 1987) where a discrepancy between the way we think we are and the way we think we ought to be leads to negative emotions that can lead to the use of systematic moral thinking. The unpleasant state of being dumbfounded could be related to this. Since moral beliefs are a central aspect of most persons' self image, the need to convince others of the soundness of one's judgments can be quite strong. This may lead to systematic reasoning processes being activated, in some cases perhaps primarily for the purpose of justification of judgments originally based on intuition. Situations, in turn, in which one experiences the need to make a good impression on others, to be accurate, to defend an important attitude or value, or to preserve self-esteem, could elicit systematic

processing (Chaiken, Liberman & Eagly, 1989; Chen & Chaiken, 1999; Petty & Cacioppo, 1986).

Although the research of Damasio (1998) and LeDoux (1993) suggests that moral judgment can be described in terms of quick initial gut feelings followed by systematic processing of the information involved, evidence for this is not conclusive and it is conceivable either that the two processes work in parallel or that the one is active while the other is passive. It would also seem possible for new intuitions to be generated during the systematic processing of a moral problem. This does not necessarily mean, however, that both of the processes are active at the same time.

Conclusions

Many modern social-cognitive models in psychology take into consideration associative processes, systematic processes and the interplay between them. Dual process models of this type now exist for a wide variety of areas, such as attitude formation, stereotyping, persuasion, person perception, and self-regulation (Smith & DeCoster, 1999) but apparently not for moral judgment. The possible contributions of research on dual processes to our understanding of moral cognition is significant, and there are practical applications of it in the areas of child rearing and education, for example. If intuition and reasoning can work in parallel, it is important that one becomes aware of this. If having sound and relevant intuitions can set free resources for systematic processing and thus increase one's capacity for moral cognition, one may succeed in making wiser moral judgments and decisions.

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Appendix

I

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Defense mechanisms and morality: A link between isolation and moralization

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The relationship between morality and perceptual defense mechanisms was studied. Three new scales were constructed to measure different aspects of morality: moralism (the tendency to evaluate everything in terms of right and wrong), conscience (strength of feelings of right and wrong) and reparation (inclination to repair the damage one has caused). Perceptual defense mechanisms were measured with Kragh's Defense Mechanism Test (DMT). Three hypotheses about relationships between morality and defense mechanisms, derived from psychoanalytical literature, were tested on 54 male University students. Results show positive correlations between the defense mechanism *isolation of affect* and moralism, and between *identification with the aggressor* and reparation. Total amount of perceptual defense correlated positively with moralism. It is argued that the psychological study of morality should take unconscious processes into consideration.

Key words: morality, defense mechanisms, DMT.

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Some scholars seem to hate psychoanalytic theory (e.g., Crews, 1998) while others just love it. Yet others experience the intrapsychic conflict of a love/hate relationship towards the theory. They love the inspiration and feelings of insight they get from it, but hate the grandiosity, post-hoc explanations, and general lack of empirical evidence. Reviewing the literature on psychological defense, Paulhus *et al.* (1997) and Baumeister *et al.* (1998) both found a broad skepticism in modern psychology towards the very notion of defense mechanisms. But although psychologists have been defensive towards the theory of defense, much recent research in personality and social psychology has been conducted on topics that are more or less identical with Freud's original ideas (Paulhus, 1997). Instead of testing psychoanalytical hypotheses many researchers have made Freud's ideas their own and used them in new models (Baumeister, 1998). Of course we should grant Freud credit for his ideas, and rather than letting mere like or dislike of psychoanalytic theory as a whole guide our research we should test the specific ideas and let the data show us where to go from there. One such idea is that defensive processes play an important role in morality (Cramer, 1991; Shapiro, 1981; Haan, 1977), and the strategy of this study was to derive a set of previously untested hypotheses about the relationships between morality and defense mechanisms and to put them to an empirical test.

Freud introduced the concept of defense mechanisms in psychology more than 100 years ago (1894/1962) and described them as unconscious strategies designed to protect the ego from anxiety. With Fenichel (1946) there was a change from the original focus on defense against anxiety-provoking thoughts about sex and aggression, and modern definitions of defense mechanisms are more inclusive. Paulhus *et al.* (1997, p. 543) define them as "... mental processes that operate unconsciously to reduce some painful emotion"; while Cramer (1998, p. 887) defines them as "... cognitive and interpersonal patterns that develop in the context of relations with others, with a primary function being the protection of the self and self-esteem".

It has been found that people differ in the specific defense mechanisms they use, but except for childhood there is not much change over time (Kragh, 1985). In other words, a person's defensive profile is a relatively stable personality characteristic. Although defense mechanisms are by definition unconscious they are related to a wide array of psychological variables, such as locus of control, attitudes toward the self, level of anxiety, intellectual ability, success in occupation, as well as psychopathological diagnoses (Cramer, 1991). Some theorists have suggested that defense mechanisms may play a central role for moral functioning (Shapiro, 1981; Haan, 1977). However, the empirical research on this issue is restricted to developmental studies showing that a general tendency to use either coping strategies or defense mechanisms in stressful situations affects moral reasoning and problem solving (Haan, 1991). The major finding is that coping strategies enhance moral functioning while defense mechanisms impede it (Haan, 1985; Hart & Chmiel, 1992). There seems to be no previous studies designed to relate specific defense mechanisms to morality.

To date moral psychology has been almost entirely focused on the study of moral development and on gender differences in morality (Lapsley, 1996, Shweder & Haidt, 1993). The dominant theory in the field is Lawrence Kohlberg's (1983) model of the cognitive stages that an individual goes through in his moral development. Following Kohlberg, most students

of moral psychology consider moral judgment and decision making high level conscious and deliberative activities, and emotions and intuitions are just not part of the game. As a comparison it is interesting to note the recent interest in unconscious mechanisms (now called automatic processes) in social psychological research. In their extensive review of dual-process research in social psychology, Wegner and Bargh (1998) found ample evidence for the idea that unconscious activation of mental representations affect impression formation, judgment and behavior. In fact, these authors claim that most mental processes are mixtures of control and automaticity. In personality psychology too, there has been a growing interest in automatic processes. For example, Epstein (1994) has made an attempt at integrating the psychodynamic model of unconscious processes into his Cognitive-Experiential Self-Theory. It is important to question the lack of dual process models in moral psychology. Is moral functioning really a purely rational activity, or is moral psychology just stuck in the barricades from the cognitive revolution? Given a relatively inclusive definition of morality, one that considers more than reasoning about justice and fairness, the findings from social psychology are consistent with the psychoanalytical claim that unconscious processes and morality are related. The present study was designed to investigate the relationships between unconscious defensive processes and moral functioning, and it was predicted that three aspects of morality; moralism, conscience and reparation, would be positively related to specific defense mechanisms.

Moralism can be defined as a predisposition to perceive the world through a moral filter, to evaluate everything in terms of right and wrong. This is said to be characteristic of persons with an obsessive-compulsive personality, who put great emphasis on justice, cleanliness, and honesty. Shapiro (1981) writes that "It is well known that the compulsive person is in various ways extremely conscientious, that he tends to be concerned with moral evaluations and with doing the right thing where others may not see any moral issue at all ..." (pp. 79–80). According to major theorists in the field (Fenichel, 1946; Shapiro, 1965, 1981), and an empirical study by Rubino *et al.* (1992), the defense mechanism *isolation* is common among these persons. Isolation works by isolating a threatening object or emotion from the self, e.g., by erecting an imaginary barrier, so that the threat is perceived as being farther away than it actually is. As a result of using one particular form of isolation, *isolation of affect*, persons with an obsessive-compulsive personality become detached from their own feelings, and are usually described as cold and unemotional (Fenichel, 1946). Isolation makes these persons very rigid and dogmatic in their thinking. This makes the link to moralism obvious: moralism is a rigid way of categorizing events and objects into mutually exclusive categories of good and bad. Based on the argument above, it was predicted that persons with a moralizing attitude use the defense mechanism isolation of affect.

Clinical studies have shown that the perceptual defense mechanism *introaggression* is characteristic of depressive, self-accusing persons, who perceive the causes of evil to be in themselves (Kragh, 1985; Smith, Johnson & Almgren, 1988). A related finding is that persons with an obsessive-compulsive personality have a strong conscience (a strong sense of what is right and wrong), where transgression of moral rules are followed by intense strikes of conscience and sometimes lead to depression (Shapiro, 1965). Accordingly, the moral self-punishment aspect of conscience seems to be related to introaggression. This leads us to the second prediction about relationships between morality and defense mechanisms: that persons using the defense mechanism introaggression have a strong conscience.

Psychoanalytic theory suggests that a strong motivation to do good seldom exists in itself (Fenichel, 1946). Instead people are seen as primarily selfish by nature and unusually strong altruistic motivation is explained as a *reaction formation* against aggression, the idea being that sadistic impulses from the id are turned into kindness towards others. Fenichel supports his claim by referring to cases where persons who are rigid in their kindness suddenly turn overly aggressive (when sadistic impulses break through the ego defense). More recently, Weinberger (1998) makes a similar claim when describing the "oversocialized" personality type; that is shy, unassertive, guilt-prone people who are highly responsive to the judgments of others. Noting that there has been little direct empirical investigation to date, Weinberger suggests that oversocialized individuals are likely to compensate for any signs of antisocial affects through such mechanisms as reaction formation and undoing, and that they can never do enough to compensate for any affective outbursts or egoistic behavior. If Fenichel and Weinberger are right, a strong need for reparation (the will to make good the bad things one has done) should be related to the defense mechanism reaction formation, which is the third prediction of this study.

METHOD

Participants

The sample consisted of randomly selected male students at Lund University. The University telephone directory was used as a sampling frame. When contacted 16% of the students chose not to participate, the main reason being lack of time. 14% of the students that said yes to participation did not show up at their testing session. The final number of participants was 54, and the mean age varied between 19 and 33 ($m = 24$). Participation was voluntary and no one was paid.

Instruments

Moral test. Almost all methods measuring moral functioning concern cognitive aspects of moral development, and no appropriate measures of the concepts relevant for this study could be found. Therefore a questionnaire with three scales—moralism,

conscience, and reparation—was constructed. Items were formulated as statements and the participants' task was to tell how well the items described them. Moralism was defined as a tendency to being overly focused on moral concerns, and items were of the type "People with low morality makes me sick", or "I think I'm more careful in asking myself what is right and wrong than others". The strength of conscience scale focused on the punitive aspects of morality, primarily feelings of guilt, and not the positive normative parts (what Freud called the ego-ideal). The scale included items such as: "I feel at once when I've done something wrong", and "It gives me bad conscience to stay in bed too long in the morning". The reparation scale was designed to measure the degree of inclination to repair damage that one has caused. Items included: "If I hit a car in a parking space by mistake, I contact the owner and compensate him for the damage" and "I try to comfort people whose feelings I've hurt". After several pilot tests of the scale a traditional item analysis was performed. The final version of the moralism scale had 15 items ($m=21.5$, $s=6.8$) and the reliability, using Cronbach's alpha, was 0.91. The conscience scale had 23 items ($m=37.3$, $s=9.9$) with $\alpha=0.90$, and the reparation scale had 21 items ($m=39.9$, $s=9.4$) with $\alpha=0.90$. The intercorrelation between moralism and conscience was $r=0.246$, between moralism and reparation $r=0.590$, and between conscience and reparation $r=0.221$

The moral test was validated against the NEO-PI (Costa & McCrae, 1985) and the *guilt* subscale from Karolinska Scales of Personality (KSP; Bergman et al., 1988) using a sample of 37 male students at Lund University. NEO is a widely used measure of the five major factors of personality; Neuroticism, Extraversion, Openness to experience, Conscientiousness, and Agreeableness. Each of the first three factors has six different facets (subscales). Moralism was expected to be negatively related to the Openness to values facet, and positively related to the Conscientiousness factor. Conscience was expected to be positively related to KSP guilt, while reparation should correlate with the warmth facet of the Extraversion factor and with Agreeableness.

DMT. Defense mechanisms were measured using the group version of Kragh's Defense Mechanism Test (DMT, Kragh 1985). DMT is a projective technique primarily used for clinical diagnosis, selection (e.g., of pilots for the Swedish Air Force), and basic research on personality. There have been several evaluations of the DMT (e.g., Cooper & Kline, 1986; Westerlundh, 1991), and the construct validity of the test is currently under debate in this very journal (Zuber & Ekehammar, 1997; Kragh 1998). The main reasons for choosing the test were that it has been used successfully in personality research before, and that it is designed to measure the specific defense mechanisms relevant for this study. The standard stimulus material, consisting of two different pictures with a central figure (hero, with whom the participant supposedly identifies), and an older, threatening male background figure (peripheral figure) was used. The stimuli were presented on a screen in two series of very short and successively longer exposures, ranging from 1/50 second to 1/2 second. The participants' task was to draw and write down their impressions. Responses were coded according to Kragh's (1985) coding manual, where certain systematic biases in perception are taken as expressions of defense mechanisms. For example, repeated failure to see the peripheral person as threatening is coded as isolation of affect, and seeing hero as wounded is coded as introaggression. If the participant repeatedly perceives the relationship between hero and the peripheral figure as positive, e.g., "they are dancing", this is coded as reaction formation. If the participant discovers the threat in the stimulus material, this is coded as "correct recognition" (see Kragh, 1985, for details on coding). Two trained raters that were blind to participants' scores on the moral test coded and scored the DMT protocols independently. The ratings were highly correlated ($r=0.87$). There were 10 possible defense mechanisms, but only the mechanisms that were found in six persons or more were used in the final correlation analysis. Defense mechanisms are generally not normally distributed, and non-parametric statistics (Spearman correlations) were calculated.

Procedure

Participants were tested in groups of four, and each session lasted 75 minutes. A standard slide-projector with a camera shutter was used as a tachistoscope. The distance between projector and screen was 65 cm, which gave a picture size of 25 × 16 cm. Illumination as measured at the screen was 140 lux, and the participants sat 140 cm from the screen. The DMT was always administered first, followed by the moral test and a short debriefing session where the experimenter explained the purpose of the study.

RESULTS

Validation of moral test

The moralism scale was unrelated to the Neuroticism factor, but there was a significant negative correlation with one of the facets, *impulsiveness*, indicating that moralism is related to good impulse control (appendix for full results of the validation). Moralism also correlated significantly negatively with the Extraversion factor, especially with the *excitement seeking* and *activity* facets. In other words, moralism is related to being reserved and to preferring a slow-paced lifestyle. In line with the predictions only one of the Openness facets, *values*, correlated significantly with moralism. This negative relationship indicates that moralism comes with a certain amount of dogmatism and unwillingness to reexamine social, political and religious values. There was a significant positive correlation between moralism and the Conscientiousness factor, which includes items concerning self-control (e.g., achievement, determination, reliability and scrupulousness), and with the KSP measure of guilt.

The conscience scale correlated highly with four of the six Neuroticism facets. Negative emotion seemed to be the common theme; a strong conscience was related to *anxiety*, *depression*, *self-consciousness* and *vulnerability*. Conscience was also negatively related to four facets of Extraversion; *warmth*, *excitement-seeking*, *assertiveness*, and *positive emotion*. That is, a strong conscience is associated with formal and reserved behavior, low self-esteem, and with seriousness rather than cheerfulness. Openness facets had no strong relationships with conscience except for *actions*; people high in conscience seem to be relatively uninterested in experiencing new things in life. Although the names are confusingly similar, the conceptual difference between conscience and Conscientiousness explains why they were not more strongly correlated. While the conscience scale measures the severity of negative moral emotions, the Conscientiousness factor concerns various aspects of self-control. The scale that it is conceptually most similar to the conscience scale, KSP guilt, was strongly correlated with it.

The main relationships between reparation and the NEO scales concerned the Extraversion factor. It was negatively related to *gregariousness* (enjoying other people's company), *activity*, and *excitement-seeking*. Reparation was positively related to several facets of the Openness factor, although not significantly. Unlike moralism and conscience, reparation is a prosocial aspect of morality. It is therefore not surprising to find that reparation was the only moral scale that correlated significantly with Agreeableness, a factor comprised of items concerning altruism and prosocial behavior. Finally, there was a strong positive correlation with KSP guilt. As the overall relationships appeared meaningful and in line with expectations, it was concluded that the moral test shows sufficient validity for the purposes of this study.

Defense mechanisms

All participants showed signs of using the defense mechanism isolation (table 1). The most common form was isolation of affect, which was found in 94% of the sample. About half of the participants (48%) had signs of reaction formation, but only 20% had introaggression. 70% of the participants reached correct recognition in at least one of the series of exposure.

Relationships between morality and defense mechanisms

As predicted, there was a significant positive relationship between moralism and isolation, especially with isolation of affect (table 2). Moralism also correlated positively with identification with the aggressor, and with total amount of defense. However, there was a negative relationship between moralism and correct recognition. The prediction concerning a positive relationship between conscience and introaggression was not supported. In fact, conscience was not significant related to any of the defense mechanisms. Reparation correlated significantly with isolation of affect and identification with the aggressor, but not with introaggression.

Table 1. *Number of Persons with a certain Defense Mechanism, Median and Quartiles (for the DMT)*

Defense mechanism	*n*	*Mdn*	*Q*
Repression	19	0	1
Isolation	54	15	3.5
isolation of affect	51	8.5	3
Denial	0	0	0
Reaction formation	26	0	0.5
Identification with the aggressor	6	0	0
Introaggression	11	0	0
Identification with the opposite sex	5	0	0
Polymorphous identification	2	0	0
Projection	11	0	0
Regression	0	0	0
Correct recognition	38	2	1

Table 2. *Spearman Correlations between Defense Mechanisms and Moral Variables*

	Moral variable		
Defense mechanism	Moralism	Conscience	Reparation
Repression	−0.159	−0.093	−0.020
Isolation	0.265*	−0.015	0.200
isolation of affect	0.469***	−0.018	0.291*
Reaction formation	−0.226	−0.063	−0.026
Identification with the aggressor	0.290*	0.214	0.335*
Introaggression	0.030	0.000	−0.022
Projection	−0.049	−0.081	−0.036
Correct recognition	−0.329*	−0.151	−0.187
Total amount of defense	0.300*	−0.002	0.101

* $p < 0.05$ *** $p < 0.0005$ (two-tailed)

DISCUSSION

Three hypotheses about relationships between defense mechanisms and morality were tested in this study. Support was found for one of the hypotheses; there was a strong positive correlation between isolation and moralism. This result fits the picture of the obsessive-compulsive personality nicely, since these persons are eager to divide good and evil into mutually distinct categories (Fenichel 1946; Shapiro, 1981). Separation and categorization seem to be the common themes here, cutting across conscious and unconscious processes. A closer examination of the mechanism of isolation shows that it is primarily isolation of affect that correlates with moralism. In other words, persons who are detached from their own emotions are more moralizing than others. Thoughts and feelings are kept apart through isolation, and good people are separated from bad people through moralization. There is a negative relationship between moralism and correct recognition (seeing the threat), and a positive correlation with total defense. It seems as if the moralists' use of isolation and identification with the aggressor prevents the anxiety-provoking stimuli from reaching consciousness. Rubino *et al.* (1992) report a similar finding, where patients with an obsessive-compulsive personality disorder seldom reach correct recognition. It is a bit surprising to see that all participants in the current study had some sign of isolation, but it is important to keep in mind that isolation is common in the DMT and that the sample consisted of male university students. Isolation is more common for men than for women, both as measured with the DMT (e.g., Westerlundh, 1976) and with other methods (Watson & Shina, 1998). Many theorists claim isolation to be an adaptive defense mechanism, which is supported by findings of positive correlations between

isolation and intelligence (Cooper *et al.*, 1991; Haan *et al.* 1973).

Introaggression and conscience were completely unrelated in this study. The prediction concerning a positive relationship between the two was made on the basis of clinical data (Kragh 1985; Smith *et al.*, 1988). Although it is possible that the strong self-accusations in depressive patients is something else than strength of conscience in male college students, a more reasonable conclusion is to accept the fact that no support was found for the hypothesis.

The hypothesis stating a positive relationship between reaction formation and reparation was also not supported. The rationale behind this hypothesis was that a strong will to do good is a defense against aggressive impulses. If we leave psychoanalytic theory for a moment, we find that there are several alternative theories of prosocial motivation in psychology today (see Batson, 1998, for a thorough review of the field). The most notable alternative theories include social learning theory, emphasizing social reinforcement and modeling (Bandura, 1991); equity theory, suggesting that the harm doer compensates the victim out of fear of retaliation or threat to self-esteem (Walster, Walster & Berscheid, 1978); and the empathy-altruism hypothesis, where empathic understanding of another person's distress is seen as the driving force of altruistic behavior (Hoffman, 1982). Although none of these theories deal explicitly with strong need for reparation, they all attempt to explain altruism and prosocial behavior without taking reaction formation into consideration and thereby challenge the fundamental psychoanalytical assumptions about egoistic and hedonistic motivation. Adding to this challenge, models in evolutionary psychology (ironically) suggest that humans are not completely selfish by nature after all. Concepts such as kinship altruism (Hamilton, 1971), and reciprocal altruism (Trivers, 1971) are used to explain how "selfish" genes may have built prosocial and morally motivated individuals, all within the framework of natural selection. These evolutionary ideas are supported by recent findings in primatology (de Waal, 1996) showing that bonobos and chimpanzees, who are genetically closely related to us, have signs of community concerns and norm related behavior. Thus the traditional psychoanalytical view of people as selfishly hedonistic and lacking a genuine motivation to do good may simply be too negative. The reaction formation hypothesis may be an unnecessarily complicated explanation of reparation, at least in a normal population.

Another finding worth mentioning is that the defense mechanism identification with the aggressor correlated significantly with both moralism and reparation, and approached significance for conscience. From the point of view of classical psychoanalysis this is interesting, since identification with the aggressor is thought to be the mechanism through which the superego is founded. The idea is that the young child's anxiety of losing parental love leads to repression of erotic and hostile impulses towards the parents. The repression is maintained through identification with the aggressor, i.e., the parent of opposite sex, whose values are internalized. Although the correlation between identification with the aggressor and morality in this study is open to a traditional psychoanalytical interpretation it must be remarked that the Oedipal hypothesis is controversial and has received little support from research in developmental psychology. Anxiety for loss of parental love does not appear to contribute to moral internalization, and identification has been found to have little effect on the development of superego strength and guilt feelings (Hoffman, 1983).

It is an obvious limitation of the present study that the sample consisted entirely of male university students, and that the results therefore cannot be generalized to the whole population. In fact, this is not just a limitation of the study but of classical psychoanalytic theory itself, which has little to say about female morality except that it is different from male morality. Another limitation of the study is that no strict conclusions can be drawn regarding the causal links between defense mechanisms and the moral variables. The ideal study would involve direct manipulation of defense mechanisms, preferably isolation, to see how moral judgment is affected. Nevertheless the present findings and recent research in social psychology suggest that the psychological study of morality should take unconscious mental activity (automatic processes) into consideration to a greater extent than has been the case to date. The overemphasis on cognitive development and reasoning may have made researchers in the field blind to important unconscious mechanisms, such as intuitions and defense mechanisms.

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APPENDIX

Validation Data: Correlations between Personality Test variables and Moral Variables

	Moral variable		
Personality variable	Moralism	Conscience	Reparation
NEO			
Neuroticism	0.07	0.52**	0.08
anxiety	0.21	0.65**	0.28
angry hostility	0.09	0.23	−0.18
depression	0.08	0.57**	0.16
self-consciousness	0.18	0.64**	0.23
impulsiveness	−0.32*	−0.25	−0.31
vulnerability	0.14	0.51**	0.06
Extraversion	−0.34*	−0.25	−0.40*
warmth	−0.15	−0.50**	0.08
gregariousness	−0.10	−0.25	−0.44**
assertiveness	−0.19	−0.37*	−0.24
activity	−0.34*	−0.14	−0.41*
excitement-seeking	−0.46**	−0.37*	−0.52**
positive emotions	−0.11	−0.37*	0.11
Openness	−0.03	−0.02	0.21
fantasy	−0.06	−0.07	0.25
aesthetics	0.19	0.20	0.22
feelings	0.14	−0.10	0.20
actions	−0.31	−0.44**	−0.09
ideas	−0.01	0.15	−0.19
values	−0.36*	−0.06	0.06
Conscientiousness	0.33*	0.11	0.09
Agreeableness	0.21	0.19	0.39*
KSP			
guilt	0.36*	0.64**	0.48**
social desirability	0.04	−0.12	0.30

Note: $N = 37$, * $p < 0.05$, ** $p < 0.01$ (two-tailed)

II

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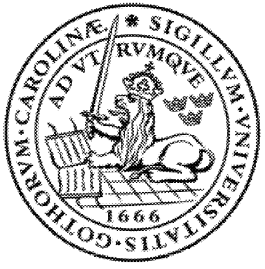

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Differences in the Justification of Choices in Moral Dilemmas: Effects of Gender, Time Pressure and Dilemma Seriousness

Fredrik Björklund

Differences in the Justification of Choices in Moral Dilemmas: Effects of Gender, Time Pressure and Dilemma Seriousness

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The effects on moral reasoning of gender, time pressure and seriousness of the issue at hand were investigated. In Experiment 1, 72 university students presented with moral dilemmas were asked to make judgments of what actions one should take in them and to justify these. Women were found to be more care-oriented in their reasoning than men, supporting Gilligan's (1982) moral judgment model. Both time pressure and consideration of everyday as opposed to serious moral dilemmas led to an increase in a justice orientation as compared to a care orientation in moral judgments. In Experiment 2, a similar task was given to 80 persons of mixed age and profession, the participants' moral reasoning being coded in terms of its being either duty-oriented (duty, obligations, rights) or consequence-oriented (effects on others). Men were found to be more duty-oriented than women, and time pressure to lead to a greater incidence of duty orientation.

Keywords: moral judgment, gender, time pressure.

In contrast to the predominant view of moral judgment as being based on reasoning that is justice-oriented (e.g. Kohlberg, Levine, & Hewer, 1983), there are models employed in the psychology of morality that make a distinction between a care-oriented and a justice-oriented morality. Authors such as Gilligan (1982) and Lyons (1983) claim that solving

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moral problems by means of reasoning about justice is primarily characteristic of males, whereas females focus on care rather than on justice and rights. Although reviews of the field suggest there to be no gender differences in moral reasoning (Lapsley, 1996, Walker, 1984), critics claim that this may be due to the vast majority of studies having used Kohlberg's approach. It has been suggested that Kohlberg's test instruments are not sensitive enough to capture care-oriented morality, since only justice-oriented issues such as law, punishment, contract, and authority are dealt with (Gilligan, 1982). This view is also supported by several studies using Gilligan's approach having shown gender differences of the type described (see Puka, 1994, for a review). However, these studies are different from Kohlberg's in that participants are usually asked to construct a moral dilemma based on a situation they themselves have experienced, a so called real-life dilemma. This method has been criticized by Walker, de Vries and Trevethan (1987), who claim that if participants are allowed to choose dilemmas themselves, findings of gender differences may simply be explained by their preference for a certain type of dilemma, rather than by actual differences in moral reasoning. If, as Pratt, Golding, Hunter and Sampson (1988) have found, women choose consistently to speak of dilemmas that are care oriented, the results of such studies may tell one more about gender roles than about the cognitive processes employed in solving moral dilemmas. To circumvent this problem, the present study employs hypothetical dilemmas of two kinds, some of them care-oriented and others justice-oriented.

There are other aspects of moral issues than those of justice and care that can affect moral reasoning. For example, there is reason to believe that people think differently in simple everyday situations than in situations with more serious moral implications. Since the possible consequences of decisions of the latter sort are more far-reaching, there is greater reason to process the information involved thoroughly, perhaps in terms of care-oriented reasoning about how others will be affected. In everyday moral decisions, in contrast, there should be lesser motivation to process relevant information, making it more likely that simple, and perhaps automatized decision rules will be applied. Although rule-oriented processing may be thorough, such as when different conflicting principles need to be considered, its occurrence would seem more likely in everyday decisions. Thus, it was predicted that, when faced with serious moral dilemmas, persons are more motivated to process information thoroughly and to reason about the possible consequences of their

decisions than when they are faced with everyday moral problems, where simple forms of justice-oriented reasoning could be used.

Another possibly important factor in moral judgment is the effect of time pressure. Many real-life decisions are made under time constraint (Ordonez & Benson, 1997), and there is no reason to believe that moral decisions are an exception to this. The moral philosopher Richard Hare (1981) suggests that an efficient way to make quick moral decisions is to use simple rules of thumb, which he calls *prima facie* principles. Examples of such rules of thumb are that "it is wrong to steal" and that "one should not lie". According to Hare, these rules are not absolute, since other, more important principles or considerations may override them, and when one has ample time to make decisions one should consider the expected consequences of each alternative thoroughly and choose the alternative that maximizes preference satisfaction. A natural question to ask in this context is to what extent time pressure leads people to use "moral heuristics" rather than their reasoning in terms of consequences. Since psychological theories of judgment and decision making are rarely explicit about the role played by the time parameter (Maule & Svenson, 1993), and since there is no generally accepted theory of the effects of time pressure on human decision making (Benson, 1993), there is no simple answer to this question. There have been relatively few empirical studies of the influence of time pressure on judgment (Svenson & Maule, 1993), and apparently no studies specifically considering moral judgment. The relevant findings thus far indicate that time pressure makes decision makers speed up their execution of decision strategies, or to switch to simpler strategies (Edland & Svenson, 1993; Johnson, Payne, & Bettman, 1993; Wright, 1974). In the present study, moral reasoning in terms of consequences is assumed to be an effortful and time-consuming activity in the same way as utility-maximizing decision strategies are. Since having sufficient time to process information in a moral dilemma situation would seem to be crucial for moral thinking in terms of consequences, it is hypothesized that time pressure increases the use of justice-oriented justifications of moral decisions.

Experiment 1

Method

Participants

A group of 72 (46 female, 26 male) students of Lund University participated in the experiment. The mean age was 24.2 (*SD* = 4.6) for the men and 22.9 (*SD* = 5.6) for the women. Participation was voluntary and no payment was offered.

Instruments

A paper-and-pencil test of moral reasoning involving 12 moral dilemmas was constructed on the basis of the results of a pilot study. Six of the dilemmas were of a kind participants in the pilot study rated as being serious, and six of a kind they rated as being significantly less serious (everyday). The serious dilemmas concerned issues such as assisted suicide or reporting a crime that a friend had committed, whereas the themes of the less serious dilemmas concerned such matters as keeping a promise, lending money to a wasteful person, or telling a white lie. In order to avoid confounding through overrepresentation of care oriented issues in the serious dilemmas, efforts were made to keep the serious and less serious dilemmas thematically similar. The order of presentation of the serious vs. the everyday dilemmas in the final test was randomized to minimize the risk of order effects.

The results of the test in the major study were coded independently by two raters, using a manual Lyons (1983) wrote in which reasoning that is focused primarily on justice, equality and fairness is coded as justice-oriented, whereas reasoning mainly concerned with the needs of others is coded as care-oriented. The raters were blind to participants' sex and to the experimental condition involved. An acceptable interrater reliability was obtained (r = .85). Answers that were primarily justice oriented were coded as 0, and those largely care-oriented were coded as 2, answers referring to both justice and care being coded as 1. A high score on the test thus indicates extensive use of care-oriented moral reasoning and a low score use of justice-oriented moral reasoning.

The time constraints to be used were based on results of the pilot study. There, participants completed the test items at their own pace. Using a modified version of a method reported by Benson (1993), a short time for test completion was operationalized as being 1.5 standard deviations less than the mean time of the group for completing the dilemmas, and a long time as 1.5 standard deviations above this mean. In the main study,

participants were tested in groups of 4-5 persons, either in the short-time (65 s) or long-time (180 s) condition, the short time being aimed at inducing a feeling of time pressure. Since narrow time constraints are not necessarily equivalent to feeling oneself to be under time pressure, its being possible to work towards a deadline without experiencing stress, efforts were made to check whether in the short-time condition participants actually experienced greater time pressure than in the long-time condition. To this end, participants were asked, after the completion of the test, to indicate the amount of time pressure experienced on a 7 point Likert scale ranging from "no time pressure at all" to "a lot of time pressure".

Procedure

Participants were randomly assigned to either the short-time or the long-time condition. They were instructed to listen to and read each dilemma story, and then to justify thoroughly their judgment of what course one should take in the dilemma. In order to keep the processing time constant over conditions, the dilemmas had been recorded on a tape that was played to participants at the same time as they read the text. The dilemmas were presented in this way, one at a time. After presentation of each, participants were to report their judgment and their justification of it in writing. Participants were not told in advance how much time they had to complete the task, but for each dilemma were told when half the time had passed and when the time was up. When all 12 dilemmas had been completed, the time pressure questionnaire was administered.

Results

Manipulation Checks

The mean level of experienced time pressure was found to be greater in the short-time 4.37 (SD = 1.28) than in the long-time condition 3.12 (SD = 1.36), a difference that was statistically significant, $t(69) = 3.96$, $p < .001$, and no gender differences were obtained. As a further check of the time pressure manipulation, two independent judges who were blind to the condition involved rated on a 5-point Likert scale for the predetermined criteria of consistency and persuasiveness the quality of the arguments participants used to justify the judgments they made, doing this for a subsample of 10 randomly selected persons (5 under the short-time and 5 under the long-time condition). The interrater reliability was fairly low but was acceptable for the purposes at hand (r = .77). A one-way ANOVA revealed a

significant difference in argument quality, participants in the long-time condition producing more convincing arguments than those in the short-time condition $F(1, 8) = 42.61$, $p < .001$.

Gender Differences

As expected, the women used care oriented reasoning to a greater extent than the men, the respective means being 12.11 (SD = 3.3) and 10.04 (SD = 3.3), a t-test for independent group yielding significance, $t(70) = 2.53$, $p < .01$.

Effects of Time Pressure and Seriousness of the Dilemma

A two-way repeated measures ANOVA with time (short vs. long) as a between-subject factor and dilemma seriousness (everyday vs. serious) as a within-subject factor was performed to analyze the effects of time pressure and of the seriousness of the dilemma on moral reasoning orientation. A significant main effect was found both for time pressure, $F(1, 70) = 15.63$, $p < .001$ and for seriousness of the dilemma $F(1, 70) = 4.60$, $p < .035$, but no interaction effect. Regarding time pressure, greater time to reason was found to result in greater use of care-oriented reasoning, the respective means being 9.97 (SD = 2.58) and 12.91 (SD = 3.68). The effect of the seriousness of the dilemma was also in the predicted direction, participants' justifications of their judgments for the six serious dilemmas being more care-oriented (M = 6.01, SD = 2.05) than for the six less serious ones (M = 5.35, SD = 2.34). These effects were independent of gender, there being no interaction effects between gender and either dilemma seriousness or time pressure.

Discussion

The aim of this experiment was to study the effects on moral reasoning of gender, time pressure and the seriousness of the moral issues involved. An effect of gender on moral reasoning in the predicted direction was obtained, the men using justice oriented reasoning to a greater extent than the women. This supports Gilligan's model of moral reasoning but not Kohlberg's (which predicts no gender differences). Nevertheless, the men and the women alike were found to use both justice and care-oriented reasoning. This result is in line with certain previous findings that have been reported (Rothbart, Hanley, & Albert, 1986; Walker et al, 1987; Wark & Krebs, 1996) but not with Gilligan's (1982) early

theoretical claim, although later withdrawn, that most people tend to rely on one, and only one, moral problem solving orientation.

The hypothesis concerning the seriousness of the dilemmas was also supported, participants using justice reasoning to justify their decisions to a greater extent when faced with an everyday moral dilemma, than when faced with a serious moral dilemma. It is conceivable that the more apparent risk of harm in the serious dilemmas is what elicited care-oriented reasoning, perhaps mediated by the goal to prevent persons cared for from being harmed. Another possible explanation of this finding could be that reasoning in terms of care is more demanding than justice reasoning, and that only dilemmas that are experienced as important motivate a decision maker to engage in care reasoning. Although no such data was collected in the present study, certain support for this type of explanation is provided by recent social psychological research, in which simple and cognitively economical processes have been found to often be used in place of more systematic and effortful processes, which only are activated when a person is clearly motivated to use them (Smith & DeCoster, 1999; Chen & Chaiken, 1999).

Time pressure was also found to affect moral judgment in the predicted direction, its appearing to force one to make quick moral judgments, and to use justice-oriented reasoning. That time pressure affected judgment was further indicated by the finding that argument quality was significantly lower in the short-time condition, arguments produced under greater time pressure being less coherent and persuasive than those produced under lesser time pressure.

Experiment 2

The aim of the second experiment was to further investigate the effect of time pressure on moral reasoning found in Experiment 1, using a broader sample in terms of age, social class and occupation, and also to test an alternative way of conceptualizing moral reasoning. It can be argued that other aspects of the content of moral reasoning, such as whether it is mainly duties or consequences that are referred to, could serve as an alternative to Lyon's (1983) coding in terms of justice-oriented and care-oriented morality. Gilligan's (1982) theory seems to imply that justice reasoning primarily involves moral principles that are expressed as duties and rights, whereas care-oriented reasoning involves the consideration of consequences. Although rare in psychology, this distinction is a common one in moral

philosophy. Deontological theories there provide reasons for something being right or wrong in terms of abstract moral rights, obligations and duties that one ought to follow, whereas teleological theories aim at certain desirable states or ends that are considered as being good in themselves, actions that promote these ends being considered virtuous. It was assumed that most statements people use to support moral judgments can be classified as involving either duties or consequences. This line of reasoning, together with certain conceptions regarding differences in how men and women support their moral judgments, led to the prediction that men should justify their moral judgments primarily in terms of duties, and women in terms of consequences.

Method

Participants

A group of 80 persons, 40 of them men and 40 women, aged 19-87, participated in the experiment. The mean age was 38.5 (*SD* = 20.1) for the men and 37.5 (*SD* = 19.1) for the women. Participants were recruited by use of posters at public places and by visiting a construction company in a small town and two homes for the elderly in a midsize town in southern Sweden.

Instruments

A paper-and-pencil test was constructed to measure the degree of attending to duty vs. consequences in moral reasoning. The test consisted of six moral dilemmas concerning issues such as the keeping of promises, responsibility towards others, civil disobedience, and charity. Four of the dilemmas (two of them serious and two of them everyday) were taken from the test used in Experiment 1, and two others (one serious and one everyday) were new. Participants were asked to read each story, make a judgment, and to justify it thoroughly. As in Experiment 1, participants' responses to each dilemma were coded into one of three categories: consideration of duties (0), consideration of consequences (2), and consideration of both (1). Answers referring primarily to abstract duties, obligations and rights were coded as deontological, whereas answers centering on results, end-states or consequences were coded as teleological. For example, in response to a story concerning whether or not to help a wasteful friend economically, a statement such as "It's my duty as a friend to help her" was coded as a deontological justification, whereas the statement "I

must help her, or she'll be devastated" was coded as a teleological justification. Coding was conducted by the author, blind regarding the sex of the participant and the experimental condition involved. An independent rater control-coded the results for 10 randomly selected persons, an interrater reliability of $r = .79$ being obtained.

Procedure

The procedure, including the time pressure manipulation, was similar to that in Experiment 1. A 2 x 2 factorial design (gender x time pressure) was used, participants being randomly assigned to the two time-pressure conditions. For each group $n = 20$, the mean age of the groups varying from 37 ($SD = 19.6$) to 38.6 ($SD = 17.3$) there being no significant differences between groups. Most participants were tested in the laboratory, but some of the older participants were tested in their homes because of their declining to come to the laboratory. Except for these older persons, 3-6 persons were tested in each session.

Results

Table 1 presents the means and standard deviations for the degree of teleological reasoning shown. The women scored higher than the men under both time pressure conditions, indicating them to use teleological reasoning to a greater extent than the men. Having ample time to justify judgments was found to foster teleological rather than duty-oriented reasoning, regardless of gender.

Table 1

Degree of Reasoning in Terms of Consequences on the Moral Reasoning Test

	Men		Women	
Condition	*M*	*SD*	*M*	*SD*
Short time	4.65	1.7	5.80	1.9
Long time	6.35	1.3	7.50	2.1

An ANOVA revealed significant main effects for both gender, $F(1, 76) = 19.0$, $p < .001$, and time, $F(1, 76) = 8.7$, $p < .004$, but no interaction effects.

Discussion

The hypothesis concerning gender differences in moral judgment was supported in this experiment, the men justifying their judgments in terms of duties to a greater extent than the women. Although an alternative way of coding responses to moral dilemmas was used, this finding indirectly supports Gilligan's (1982) thesis of gender differences in morality.

The other main finding in this experiment was that time pressure affects the mode of reasoning shown in connection with moral dilemmas. Having only a short time to make a judgment led to participants' referring to duties and rights rather than being concerned about consequences. A cognitive explanation seems plausible enough, that when one is short of time one cannot readily engage in the slow, thorough, and effortful reasoning needed to figure out the possible consequences of one's decisions. Instead, one compromises by referring to duties, possibly in the form of rules of thumb. Hare (1981) argues that an important part of child rearing concerns teaching rules of this type, and that moral heuristics are internalized by the child and used throughout life, especially when under time pressure or mental load. Although other explanations for the use of heuristic moral decision rules are possible, such as in terms of schema theory or implicit learning, there is an apparent linguistic similarity between heuristic moral rules and the reprimands parents give their children when they have done something wrong.

General Discussion

The aim of the present study was to investigate the effects on moral reasoning of gender, time pressure and the seriousness of moral dilemmas. In both experiments the effects were found to be in the predicted direction. There are certain limitations to the generality of the results, however. First, the fact that the content of a moral dilemma has been shown to guide the kinds of moral reasoning people use (Walker, 1991; Wark & Krebs, 1996) makes it important in studying moral reasoning to present dilemmas involving different kinds of moral issues, in particular those reflective of justice and those reflective of care considerations, so that they mirror the dilemmas one faces in real life. Although this

distinction was employed here, one can nevertheless argue in this connection regarding how the concept of morality should best be defined.

Secondly, all participants in Experiment 1 were undergraduate students and, although the participants in Experiment 2 were more diverse, no systematic efforts were made to produce a representative sample of Sweden. However, it is possible that the gender differences found are partly an expression of gender roles (Gilligan, 1982; Cross & Madson, 1997), and that typical gender roles might be more clearly shown in other groups than college students, since the latter are often considered to be particularly liberal or "androgynous" compared with the population at large. If this is true, the use of a more representative sample would rather increase than decrease the findings of gender differences in moral reasoning.

Thirdly, it is important to note that time pressure of the kind experienced in the laboratory can differ considerably from pressure of the kind experienced in everyday life, and that it would seem likely that different kinds of pressure and stress would affect moral judgment differently. Furthermore, having a long time to solve a moral dilemma in a study such as this is obviously not the same as having ample time for it in real life. Many persons prefer having a long incubation period for solving a moral problem (being able to "sleep on it") or they want to distribute responsibility or enrich the decision process by discussing the problems involved with close friends (Björklund, 2000; Heath & Gonzalez, 1995). Allowing moral reasoning and the information processing associated with it to continue for an extended period of time could be difficult to achieve in an experiment, but could provide valuable results.

The present study made no effort to identify any critical point for how much time pressure would be needed for a person to begin using a heuristic rather than a systematic moral decision making strategy. Payne, Bettman and Johnson (1988) found, however, that when people make risky decisions under time pressure they tend initially to retain their decision strategy while endeavoring to accelerate their information processing. If this is not enough to meet the deadline, they "filter" information, attempting to select particularly relevant pieces of information, only changing their strategy altogether if the time pressure becomes extreme. Critical points for a shift of strategy in the moral domain could be studied in a situation similar to that employed here, for example by using a within subjects design in which serious vs. everyday moral dilemmas were presented in counterbalanced

order and participants first made moral judgments without a time constraint and then received less and less time to solve the problem at hand. On the basis of the results of the present study and the Payne et al (1988) study, one could predict that many persons would start off with use of teleological reasoning, and would then try to speed up their reasoning process when a time constraint was introduced, and that under severe time pressures they would tend to change to a heuristic strategy, especially when making judgments of serious moral dilemmas. The introduction of greater cognitive load would probably speed up the shift of strategy. Introducing such a load in an experiment would possibly increase the ecological validity of the results obtained since many real-life moral decisions are made under both time pressure and high mental load. In addition to cognitive factors, individual difference variables may serve as moderators for how decision makers cope with time pressures. For example, Verplanken (1993) found that, when under time pressure, persons low in Need for Cognition (motivation for and enjoyment of effortful cognitive activities) appear to use more heuristic information search strategies than those high in it.

Does the fact that having more time to reason or being confronted with a serious moral problem appears to lead to a greater amount of teleological thinking, and that women appear to be more concerned with the consequences of their decisions than men, imply that women are more serious, or more sophisticated, in their moral reasoning than men are? Not necessarily, the traditional lay psychological opinion in the West could very well be interpreted as the opposite. A well-defined and stable set of moral principles that guarantees a considerable degree of consistency over time tends to be considered virtuous, whereas the more dynamic form of reasoning in which consequences are focused upon is often regarded as being too open to self-serving bias. It would appear intuitively that both moral judgment strategies can be used with considerable success interchangeably. Interestingly, there are certain normative moral theories, termed rule-based utilitarian theories, that combine the two kinds of thinking (e.g. Brandt, 1979). According to these, one's decisions and judgments should, when appropriate, be based on moral rules, but the specific rules used should be determined by their expected consequences.

In everyday life, one is forced to make many moral decisions and moral judgments without one's having the time or the energy to reflect on them in detail. Recent social psychological findings suggest that many of these judgments are indeed made automatically and intuitively (Wegner & Bargh, 1998). There is also reason to believe that

the justifications and explanations of moral judgments are often ex-post-facto artefacts, just as can be assumed to be the case for other types of judgments (Björklund, Haidt, & Murphy, 2000; Haidt, 2000; Nisbett & Wilson, 1977; Wason & Evans, 1975). It is quite possible to interpret the statements participants made regarding the moral dilemmas with which they were faced as simply representing rationalizations of quick intuitive moral judgments. If this is the case, the gender differences in moral reasoning could be regarded as differences in ex-post facto rationalization of moral judgments. Teleological reasoning might then represent simply an effortful and time-consuming form of rationalization, having little or no effect on the actual judgment. Given the possibility of such an explanation, not only would Kohlberg's view of persons being amateur moral philosophers seem exaggerated, but also the exclusive focus on reasoning in moral psychological research would appear to have been conducted at the expense of research on emotional and intuitive aspects of moral judgment and decision making.

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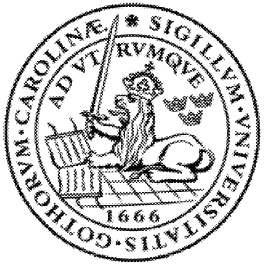

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Moral Dumbfounding: When Intuition Finds No Reason

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Moral Dumbfounding: When Intuition Finds No Reason

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Two experiments tested the hypothesis that moral judgment can be based on intuition rather than reason. In Experiment 1 thirty participants were presented with a classic moral reasoning dilemma (Heinz), and with four tasks that were designed to put intuition and reason in conflict. On the four tasks, but not the reasoning dilemma, judgments were based more on gut feelings than on reasoning, and participants more frequently laughed and directly stated that they could give no reasons in support of their judgments. This phenomenon, the stubborn and puzzled maintenance of a judgment without supporting reasons, was dubbed "moral dumbfounding." In Experiment 2 reasoning processes were put under pressure by means of a cognitive load. High load led to lower argument quality, but failed to show the predicted effects of increased dumbfounding and shorter time to giving up the discussion. The existence of moral dumbfounding calls into question models in which moral judgment is seen as solely produced by moral reasoning.

Keywords: moral judgment, moral reasoning, intuition.

How do we know what is right and what is wrong? On what is morality based? These questions are as old as philosophy itself. Plato (trans. 1973) held that the Form of the Good was directly apprehended through the study of philosophy. For Aristotle (trans. 1953), the good was not a mystical metaphysical unity, but rather a mixed bag of virtues. By habituating oneself to these virtues, one reaches *eudaimonia*, a kind of moral

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flourishing and well-being. But both of these early philosophers agreed that control of the passions by reason was essential to virtue and morality. For the more than two thousand years since, most philosophers have agreed with them.

It was not until the middle of the eighteenth century, during the "Age of Reason" no less, that the dominance of reason in morality came under serious attack, in the writings of the Scottish philosopher David Hume (1739/1992). Hume observed that "Nothing is more usual in philosophy, and even in common life, than to talk of the combat of passion and reason, to give the preference to reason, and to assert that men are only so far virtuous as they conform themselves to its dictates" (p. 413). He noted that reason was held to be eternal, invariable and divine, while passion was held to be blind, inconsistent, and deceitful. "In order to shew the fallacy of all this philosophy," he continued, "I shall endeavour to prove *first*, that reason alone can never be a motive to any action of the will; and *secondly*, that it can never oppose passion in the direction of the will" (p. 413).

Hume did not fully succeed in his philosophical proofs of the impotence of reason. The present study, however, tests Hume's claims empirically. No study could possibly show that reason can *never* oppose passion in the direction of the will, and indeed we think it unlikely that this hyperbolic claim is true. However, one can investigate a class of moral dilemmas in which reason and passion conflict. If Hume is (generally) correct, then passion will determine judgment and people will follow their feelings, even when they lack reasons to support these feelings. If Hume is incorrect, then reasoning should precede judgment, and judgment will not be made without reasoning.

Before one can undertake an empirical test of Humean psychology, however, one needs to bring its terms up to date. Hume's most radical claim about human judgment was that "Reason is, and ought only to be the slave of the passions, and can never pretend to any other office than to serve and obey them" (1739/1992, p. 415). But what, in modern terms, are passions? In other passages in the same work Hume gives examples of passions such as anger, hope, fear, grief, joy, despair or security, suggesting that what he means are what we now call emotions, broadly construed. Elsewhere in the work, he discusses the emotions of "aversion" and "propensity", which motivate us to "avoid or embrace what will give us this uneasiness or satisfaction" (p. 414). In modern terms he appears to be discussing a general approach-avoidance system (Davidson, 1992). This approach-avoidance system is particularly important in the moral domain, giving us a "general appetite to good, and aversion to evil" (p. 417). As such Hume, like his fellow Scotsman Adam Smith (1759/1966), was proposing an innate moral sense (see Wilson,

1993, for a modern version of a moral sense). Hume argued that this moral sense gives us certain "calm passions" which, because they do not cause as much "disorder to the soul" as the emotions do, are often mistaken for the products of reason. In modern terms these calm passions might be called intuitions, or, more popularly, "gut feelings". Noting the growing interest in social cognition for the study of implicit processes of this kind (Chaiken & Trope, 1999; Greenwald & Banaji, 1995; Wegner & Bargh, 1998), we will use the term "intuition" in the present article to denote a quick, effortless and uncontrollable cognitive process, largely outside consciousness and independent of reasoning, that gives us a sense of rightness or wrongness and results in a moral judgment.

But what about the relationship between intuition (passion) and reason? Hume used the metaphor of master and slave, which we suspect will fail to resonate (or worse) with modern audiences. One can update this metaphor, while still preserving Hume's dismissal of reason, as follows: "*reason is the press-secretary of the intuitions, and can pretend to no other office than that of ex-post facto spin doctor.*" In modern political life, the U.S. President first makes his decisions, and then dispatches the press-secretary to justify and rationalize the decisions. The press secretary may have no access to the real causes of the President's decision and thus be free to compose whatever argument will sound most convincing to the general public. Everyone knows that it serves no purpose to argue with the press secretary. Convincing this person that her/his arguments are specious or that the President's decisions are wrong will have no effect on the president's decisions, since these are not based on the press secretary's arguments.

Several modern psychological theories have posited a similar ex-post facto role for reasoning. Nisbett and Wilson (1977) showed there to be various cases in which people's behavior or judgment is influenced by factors outside their awareness. Yet when asked to explain their behavior people promptly constructed plausible sounding explanations using implicit causal theories. Haidt, Koller and Dias (1993) observed a similar phenomenon in interviewing people about harmless and victimless violations of taboos, such as eating one's (already dead) pet dog, or cleaning one's toilet (in private) with one's national flag. Participants often stated immediately and emphatically that the action was wrong, and then began searching for plausible reasons. They frequently tried to introduce an element of harm, for example by stating that eating dog meat would make a person sick, or by stating that a person would feel guilty after voluntarily using one's own flag as a cleaning cloth. When the interviewer repeated the facts of the story (e.g., that the dog

was thoroughly cooked, so that no germs were present), participants would often drop one argument and begin searching for another. It appeared that judgment and justification were two separate processes, that judgment came first, and that justification relied on what Nisbett and Wilson might call "implicit moral theories", such as that moral violations have victims.

Several theorists have thus suggested that, at least for some issues, moral cognition involves two independent processes, moral judgment being similar to perception (quick, non-verbal, effortless, and often utterly convincing) whereas moral reasoning is an ex post facto process, akin to explaining in words what one sees with one's eyes. A useful language for discussing these two processes stems from Margolis (1987), who calls them "seeing-that" and "reasoning why". Margolis theorizes that the structure of the human brain cannot be radically different from that of its evolutionary ancestors. Our brains have been structured by millions of years of evolution for the function of pattern recognition, and our higher cognitive processes (such as reasoning) are only new and recent functions carried out by these same old structures. Although we may fancy that human cognition takes place exclusively by use of language and logic, the brain's structure and evolutionary history imply that most of our cognition involves instead processes of pattern matching, what Margolis (1987) calls "P-cognition" (for pattern cognition). If the brain's structure is primarily set up for P-cognition and not for logical reasoning, this could explain why persons are notoriously bad at logic problems, e.g., the Wason four-card selection task (Wason & Johnson-Laird, 1970).

Margolis' (1987) theories are also in line with Nisbett and Wilson's (1977) work. Margolis holds that the evolutionarily old process of P-cognition generally first provides a quick, pattern-matching "seeing-that", which is then followed by a reasoned, but post hoc, critical thinking process he calls "reasoning-why". This meshes well with Nisbett and Wilson's observations that people often cannot accurately report on the causes of their mental processes which, in fact, both Nisbett and Wilson and Margolis suggest are often post hoc best guesses based on the information available in the current situation. Although far from proving intuition to cause judgment, this does indicate that we are often mistaken when we claim our judgments to be made on the basis of explicit reasoning about facts about the world.

Experiment 1

There are good theoretical grounds, therefore, for proposing that moral judgment is often based on a quick, intuitive judgment ("seeing-that") followed by a slow, ex-post facto justification ("reasoning-why"), rather than on a systematic reasoning process as described in traditional psychological models of moral judgment (e.g. Kohlberg, 1969). The present study tests this modern Humean proposal by placing participants in a situation in which the two processes are forcibly separated. We interviewed people about situations that were likely to produce strong intuitions that an action was wrong, yet we engineered the situations to make it extremely difficult for them to find strong arguments to justify these intuitions. If Hume is right, people should cling to their intuitions, even in the absence of justification. If Hume is wrong, people should show a tight linkage between reasoning and judgment and should not hold a judgment in the absence of reasons for it. We predicted that in these situations people would often make automatic, intuitive judgments, and then be surprised and speechless when their normally reliable "press-secretary" failed to find any reason to support the judgment. To contrast with these situations, we also gave participants a traditional moral judgment task, from Lawrence Kohlberg (1969). Commonly referred to as the "Heinz dilemma", it depicts a man (Heinz) who considers stealing a drug to save the life of his dying wife, requiring participants to balance the interests of two people (the wife, versus the drugstore owner). We expected the Heinz dilemma to be easy for the "press-secretary" to discuss, opening up the possibility that prior moral judgment research has tilted too heavily towards reasoning because of using dilemmas that were particularly easy to reason about.

Method

Participants

Participants were 18 female and 13 male undergraduate students at the University of Virginia who received credit towards an experimental participation requirement. One participant was 48 years old, and the others ranged in age from 18 to 20. One participant refused to release the videotape made of her behavior; thus, the final sample consisted of 30 participants (17 female, 13 male).

Materials

Five tasks were used: one moral reasoning story (Heinz) and four tasks supposedly calling for intuitive judgments (see Appendix A for the full scripts). The Heinz dilemma

was chosen because it requires tradeoffs between competing interests, and could thus be expected to lead to dispassionate moral reasoning. Furthermore, it is the most widely used story in research on moral reasoning, thereby offering a clear anchor point for comparisons with other kinds of moral stories.

In addition to the Heinz dilemma, we used two "intuition" stories written to be simultaneously harmless yet disgusting. One of these stories (*Incest*) depicts consensual incest between two adult siblings, and the other (*Cannibal*) depicts a woman cooking and eating a piece of flesh from a human cadaver donated for research to the medical school pathology lab at which she works. These stories were chosen because they were expected to cause the participants to come to a quick intuitive "seeing-that" the act described was morally wrong. Yet since the stories were carefully written so that nobody in them was harmed, participants are prevented from engaging in the usual "reasoning-why" that persons in Western cultures often use to justify moral condemnation (Haidt, Koller & Dias, 1993), thereby supposedly producing a judgment profile different from that of the Heinz dilemma.

Two "non-moral intuition" tasks, *Roach* and *Soul*, were also used. *Roach* was taken from Rozin, Millman, and Nemeroff (1986). In this task participants are asked to drink from a glass of juice both before and after a sterilized cockroach has been dipped into it. In the *soul* task participants are offered two dollars to sign a piece of paper and then rip it up; on the paper are the words "I, (participant's name), hereby sell my soul, after my death, to Scott Murphy (the experimenter), for the sum of two dollars." At the bottom of the page a note was printed that said: "this is not a legal or binding contract" (see Appendix A). These tasks were designed to produce a situation cognitively equivalent to that of the moral intuition tasks - a clear "seeing-that" the act was wrong or undesirable, coupled with difficulty in "reasoning-why" to justify one's refusal - which should lead to responses more similar to those to the intuitive stories than to the Heinz story.

Design and Procedure

Participants were interviewed individually in a lab room equipped with a one-way mirror. Shelving and boxes covered all but a small portion of the mirror, obscuring it from view. A video camera was located behind the clear portion of the mirror, in an adjoining room, and a microphone was concealed in the ceiling above the participants' chair. To further convince participants that they were not being videotaped, the lab room

also contained a large and conspicuous video camera on a tripod, visibly unplugged and pointed away from them.

After being thanked for taking part in the experiment, participants were told that they would be presented with five "situations" in which they would be asked either to make a judgment or to do something, and in which, despite there being no right or wrong response, the experimenter would play the "devil's advocate" by questioning their judgments or actions, as well as the reasons they provided for them. Participants were further told that they might find the stories or tasks objectionable, and that they could decline to participate in any given task, or even withdraw from the study entirely. After asking participants to sign the informed consent form, the experimenter, gesturing vaguely in the direction of the unplugged video camera in the lab room, mentioned that the video camera would be used later in the study, but that, after the experiment, participants would be given the option to refuse to allow the videotape to be analyzed.

The five stories/tasks were then presented in one of the two following orders, randomized within each gender separately so as to counterbalance for order effects: *incest, roach, cannibal, Heinz, soul; or Heinz, cannibal, roach, incest, soul*. After each of the *Heinz, cannibal*, and *incest* stories was read, participants were asked if what the depicted person or persons did was wrong, whereas in the *roach* and *soul* tasks they were asked to drink the "roached" juice, and to sign the "contract", respectively. The experimenter would then "argue" in a non-aggressive way with participants, in efforts to undermine whatever reasons they put forth in support of their judgment or action. For example, if after hearing the *incest* and *cannibal* stories, participants responded that what the person or persons in the story did was wrong, the main counterargument presented was that no harm was done, and that the fact that an act is disgusting does not make it wrong. For the *Heinz* story, Kohlberg's (1969) "probe questions" were largely relied upon; for example, if participants responded that it was right for Heinz to steal the drug for his wife, they were asked if it would be just as right for Heinz to steal the drug for a stranger, or for a pet animal that he loved. In the *roach* task, if participants refused to drink, the fact that the cockroach had been sterilized was stressed, such as by pointing out that it was cleaner than the juice. Finally, if in the *soul* task participants refused to sign, it was pointed out that they could immediately tear up the "contract", and that it was printed on the "contract" that it was non-binding.

After the discussion that followed each task, participants were asked to fill out a short questionnaire asking them to indicate on a 7-point Likert scale their level of confusion,

irritation, and confidence in their judgment, and to what extent the judgment was based on reasoning or on a "gut feeling". Finally, the experimenter apologized for arguing with the participants, explained the hypothesis of the experiment, revealed that the session had been videotaped, and asked the participants whether they would grant permission for the tape to be analyzed, to which all but one participant agreed.

Results

In a preliminary analysis, the effects of gender and story order were tested for in a 2 (man vs. woman) x 2 (order A vs. order B) MANOVA, which revealed fewer significant effects than expected by chance alone. In the analyses that followed, data was thus collapsed over gender and order, which were only introduced as covariates in the analyses where gender or order had an effect on the dependent variable at hand. For each set of variables presented in Table 2-5, a repeated measures ANOVA was performed across the five tasks to examine task effects. The F and p values for each univariate test are reported in the far right column of each table. Planned contrasts were performed between the Heinz task and each of the other four tasks, those tasks which differed from the Heinz task at $p < .05$ being marked with an asterisk.

Table 1

Basic Moral Judgments

	Moral Reasoning	Moral Intuition		Behavioral Intuition	
Variable	Heinz	Cannibal	Incest	Roach	Soul
Initial judgment (% yes/OK)	80	13	20	37	23
Final judgment (% yes/OK)	93	28	32	47	40
% who changed	13	17	17	10	23

Note. Since the % who changed is based on changes in either direction it does not refer simply to the difference between the initial and the final judgment.

Judgments and Timings

Table 1 shows the basic judgments made on all five tasks by the 30 participants. A strong majority felt that it was all right for Heinz to steal the drug, but considered it

wrong to eat human flesh or to have consensual incest with one's sibling. There were 37% of the participants who were willing to drink the roached juice, but only 23% willing to sign the soul-selling contract. Since after discussions with the interviewer the percentages were slightly higher; the interviewer did change some participants' minds in the direction for which he was playing devil's advocate, except for the Heinz story, where the percentage that endorsed Heinz' stealing rose, despite the interviewer in most cases arguing against that position. On the average, 16% of participants changed their minds, a figure that did not differ significantly across tasks.

Table 2

Mean Judgment Times

	Moral Reasoning	Moral Intuition		Behavioral Intuition		
Variable	Heinz	Cann.	Incest	Roach	Soul	*F*
Seconds to 1st argument	11.2	9.6	12.6	6.2*	24.8*	16.72, $p<.001$
Seconds to 1st evaluation	20.0	15.5	9.9	3.9*	18.3	4.14, $p<.01$
Seconds evaluation precedes argument	-8.8	-5.9	2.7	2.3	6.5	3.03, $p<.05$

Note. * = differs significantly ($p<.05$) from the Heinz task.

The order of events in making judgments differed across tasks. As can be seen in Table 2, for the Heinz story the first argument participants presented preceded the first evaluation (judgment of right or wrong) there on the average by 8.8 seconds. On the behavioral intuition tasks, however, the order was reversed, participants generally first presenting their evaluations and later giving reasons for these. Results for the moral intuition tasks in turn, were split, for the cannibalism story arguments preceded evaluations by 5.9 seconds, but for the incest story evaluations preceded arguments by 2.3 seconds.

Table 3

Mean Self-ratings on Likert Scales

	Moral Reasoning	Moral Intuition		Behavioral Intuition		
Variable	Heinz	Cann.	Incest	Roach	Soul	*F*
How sure are you?	6.20	5.10*	5.37*	5.83	5.43*	2.34, p=.059
How much did you change your mind?	2.50	2.87	2.77	2.20	2.97	1.09, n.s.
How confused were you?	2.87	4.03*	4.00*	1.97*	3.43	8.77, p<.001
How irritated were you?	1.77	2.57*	2.20	1.43	2.00	5.40, p<.01
Judgment based on gut?	4.50	4.93	5.13	4.57	5.07	.97, n.s.
Judgment based on reason?	5.03	4.27	3.87*	3.90*	3.47*	3.67, p<.01
Gut minus reason	-.53	.67*	1.27*	.67	1.60*	2.70, p<.05

Note. For Likert ratings, 1=no/low, 7=yes/high. * = sign. different from Heinz at p<.05

Self-reports

Results for the self-reports participants made on Likert scales after each task are shown in Table 3. Significant differences between tasks were obtained on five of the questions: 1) participants' certainty regarding their judgments, being significantly higher on the Heinz task than on the cannibalism, incest and soul story/tasks; 2) how confused participants felt, feeling significantly more confused on the cannibalism and incest tasks than on the Heinz task, and significantly more confused on the latter than on the roach task; 3) how irritated participants felt in discussing the task; irritation being rated low on all the tasks, lowest on the roach task, followed by the Heinz task, and being rated significantly higher on the cannibalism task than on the Heinz task; 4) to what extent participants considered their judgments to be based on "careful reasoning about the facts and issues involved", being highest on the Heinz task and significantly lower on the incest, roach and soul tasks; and 5) the difference between participants' ratings of the degree to which they relied on reasoning versus "gut feelings", where only on the Heinz task participants relied more on reasoning than on gut feelings in their judgments.

Argument Issues

Table 4 shows the means of variables, coded from the videotapes, pertaining to the arguments participants employed. A significant task effect on the number of arguments participants dropped (that is, repudiated, or at least stopped defending under cross-examination) was found, being least on the roach and the Heinz tasks, and significantly greater on the cannibal and incest tasks than on the Heinz task. There was also a significant effect of task on the ratio of dropped to kept arguments, being lowest (.69) on the Heinz task, which meant that most arguments were retained there, and significantly higher on both of the moral intuition stories, for which approximately two arguments were dropped for each one kept.

Table 4

Means of Argument-related Variables

	Moral Reasoning	Moral Intuition		Behavioral Intuition		
Variable	Heinz	Cann.	Incest	Roach	Soul	*F*
Arguments dropped	2.9	6.4*	6.0*	2.7	3.60	8.40, $p<.001$
Arguments kept	4.2	3.2	3.2	3.1*	3.63	.90, n.s.
Ratio dropped/kept	.69	2.0*	1.87*	.87	.99	5.96, $p<.001$
Dead-ends	.50	.83	.83	.20	.57	1.47, n.s.
Unsupported declarations	.8	1.9	2.4*	.1	1.00	3.03, $p<.05$
Statements of dumbfoundedness	.1	.8*	1.3*	.6	.7*	4.07, $p<.01$

Note. * = differs significantly ($p<.05$) from the Heinz task.

Participants made few unsupported declarations (e.g., "It's just wrong to do that!") on the Heinz task, and significantly more in the incest task. They made the fewest statements of "dumbfoundedness" on the Heinz task (e.g., "I can't explain why, but I think it's wrong", only two such statements from as many participants) and a significantly greater number of such statements on the incest (38 statements from 23 different participants), cannibalism (24 from 11 participants), and soul tasks (22 from 13 participants). No task

effect on the number of dead-ends occurring was found, this being defined as use of arguments that are begun but are then dropped in mid-sentence, so that the participant begins a line of thought without finishing it.

Non-Verbal Behavior

The behavioral intuition tasks tended to take less time than the moral judgment tasks (on average 122 seconds for roach and 292 for soul, as compared with 379 for incest, 399 for cannibal, and 432 for Heinz), and therefore involved less time for non-verbal and quasi-verbal behaviors such as laughter and saying "um". To correct for this time discrepancy, the total number of such behaviors per person and task was divided by the number of minutes the task took.

Table 5

Means of Paralinguistic and Non-Verbal Behavior Variables, Per Minute, Across Story/Task

	Moral Reasoning	Moral Intuition		Behavioral Intuition		
Variable	Heinz	Cann.	Incest	Roach	Soul	*F*
ums, uhs, hmms	1.98	1.70	1.94	.98*	1.25*	5.70, $p<.001$
exclamations	.10	.08	.07	.20	.11	1.12, n.s
turns with laughter	.55	.94*	.69	2.54*	1.62*	18.79, $p<.001$
turns with pen fiddle	.53	.80	.50	.88	.71	1.09, n.s.
turns with face touch	1.13	1.16	1.06	1.85*	1.77*	3.83, $p<.01$
doubt faces	.06	.05	.14	.01	.02	4.71, $p<.01$

Note. * = differs significantly ($p<.05$) from the Heinz task.

Table 5 points at a split between the two behavioral tasks and the three moral judgment tasks in the sense that on the behavioral tasks participants were found less likely to say "um", more likely to laugh, and more likely to touch their faces (a potential sign of embarrassment according to Keltner & Buswell, 1996) than on the Heinz task, which on

these points appeared basically similar to the two moral intuition stories.

Discussion

The aim of Experiment 1 was to test the hypothesis that moral judgment can be based on intuition rather than on reasoning. The results for the Heinz task conformed with the standard expectations of moral judgment research in the sense of arguments preceding evaluations, judgments being based more on reason than on gut feelings, most arguments being hung onto, participants reporting that they were fairly sure of their judgments, and their rarely saying that they were unable to explain their judgments. The picture of the two moral intuition tasks, however, was quite different. On those tasks, these same participants were less certain and more confused, and relied on their gut feelings more than on their reasoning. They also showed more "signs of dumbfounding" in the sense of dropping most arguments they put forward, frequently making unsupported declarations, and often admitting to not being able to find reasons for their judgments. In most respects, the behavioral intuition tasks were more similar to the moral intuition tasks than to the Heinz task in how participants responded to them. The matter was different, however, for the paralinguistic and non-verbal measures. The behavioral tasks, in comparison with the Heinz task and also with the moral intuition tasks, elicited higher rates of laughter and face-touching, perhaps because they were "funnier" than the judgment tasks, or perhaps because they required the participant to perform a real, self-relevant behavior. To conclude, the dumbfounding phenomenon seems to occur when a strong intuition is left unsupported by any reasons that can be verbalized, and this finding was followed up in a second experiment.

Experiment 2

The major aim of Experiment 2 was to further test Hume's intuitionist model of moral judgment, by a direct manipulation of reasoning ability. If, as has been suggested by Kohlberg (1969), moral judgment is primarily based on reasoning, a mental load could be expected to make judgment more difficult. Yet if reasoning is an ex-post-facto product serving to defend a judgment that has already been made intuitively, a cognitive load should have little effect on the judgment process itself and should primarily affect simply rationalizations of it. It was thus predicted that putting people under pressure by means of a cognitive load would decrease reasoning capacity, leading to less complex and persuasive arguments, more signs of dumbfounding, and "giving up" more quickly when

pressed to provide reasons for the position taken, but that it would have little effect on the judgment process itself, such as the time needed to arrive at a moral judgment.

Method

Participants

Participants were 49 (30 female and 19 male) introductory psychology students at the University of Virginia who participated for course credit.

Materials

Two stories supposedly eliciting strong moral intuitions were employed, the "incest" story from Experiment 1, and the new "Drug story", involving a research chemist producing and taking LSD-related drugs, but only producing it for her own use and in the privacy of her own home. In addition to the intuition stories, two reasoning stories were given, the "Mazda" story from Haidt and Baron (1996) in which a man sells his car to a woman in his neighborhood, not telling her that it may be defective, and Kohlberg's (1969) Heinz dilemma, modified so that Heinz does not steal the drug in the end. The stories were given in a counterbalanced order, and the full texts are to be found in Appendix B.

Procedure

Participants were tested individually in the laboratory, led to believe that the purpose of the study was to investigate the relationship between memory and judgment. As in Experiment 1, they were told that their judgments would be challenged, and also that if they ever got to a point where they found themselves unable to explain their moral opinion, they could simply say "I can't explain any further" (referred to here as the "escape phrase") and the experimenter would stop and move on to the next story.

Before listening to a story, participants received an envelope containing a slip with two numbers written on it, and were asked to memorize both. For participants in the high-load condition, the first number consisted of five digits, e.g. "98527", whereas the second number, called the increment number, had just one digit (for example "7"). In contrast, participants in the low-load condition received the load number "1" and the increment number "1". Since the number slips were kept in envelopes, the experimenter was blind to the experimental condition involved.

Immediately after listening to a story, participants were asked to make an initial judgment of whether what the characters in the story did was wrong or OK. They were also asked to make an initial rating of *how* wrong the action was, on a scale ranging from 0 ("Perfectly OK, nothing wrong at all") to 100 ("Extremely wrong, the worst thing anyone could ever do"), followed by the dumbfounding procedure used in Experiment 1, but with the addition of the participants being asked by the experimenter to add the increment number to the load number three times during the interview: immediately after the first judgment, after 60 seconds, and after four minutes. Following the discussion, a one page questionnaire was administered, asking for a final judgment of whether or not the action was wrong, a judgment of how wrong it was (on the 100 point scale), and estimates both of the extent to which the judgment was based on gut feelings or on reason, and of how committed they were to their final judgment (on 7-point Likert scales). Participants were also asked to report in writing the final load number as they remembered it, and to on a 7 point Likert scale ranging from "No interference at all" to "A lot of interference" give an estimate of how much the retaining and incrementing of the number had interfered with their ability to think and talk about the story. The interviews were videotaped, with the participants' knowledge of this.

The results were coded in the same way as in Experiment 1, argument quality being rated independently by two raters on a five point Likert scale, 5 representing a rational and well founded argument put forward in a convincing way. Raters were blind to the hypotheses, and coded both the first argument that the participants gave (1st reason) and the discussion as a whole, achieving an acceptable interrater reliability (r = .78).

Results

As in Experiment 1, effects of gender and story order were investigated by means of a MANOVA, fewer significant effects being obtained than expected by chance, these variables were added as covariates in the further analyses of the variables on which they were found to have an effect. An outlier analysis revealed three extreme cases well over 2 standard deviations from the mean on the response time variable. Removal of these cases decreased the overall mean and standard deviation significantly, from 5.35 s (SD = 5.3) to 4.31 s (SD = 3.3). In all further analyses the response time variable was used in its trimmed form.

Table 6

Self Reported Use of Gut Feelings vs. Reason

Variable	Incest	Drug	Mazda	Heinz	*F*
Reliance on gut feelings	5.63	4.33*	4.43*	4.02*	16.95, $p<.001$
Reliance on reason	4.22	4.94*	4.59	4.94*	3.55, $p<02$
Gut feelings minus reason	1.41	-.61*	-.16*	-.92*	11.09, $p<001$

Note. * = differs significantly ($p<.05$) from the Incest story.

Manipulation Check

Table 6 shows participants' self reported use of gut feelings vs. reasoning in their judgments of the four stories. The gut minus reason variable served as the main manipulation check, expectedly indicating participants to have relied more on gut feelings than on reason in judging the incest story, and vice versa in judging the Heinz story.

Table 7

Basic Judgments

Variable	Incest	Drug	Mazda	Heinz	*F*
Initial wrongness (100-point scale)	72.24	37.76*	54.88*	27.33*	33.51, $p<.001$
How much worse at end (100-p. scale)	-2.94	2.45	-3.06	4.92*	3.46, $p<.02$
Response time (seconds)	3.02	4.61*	3.13	6.48*	10.83, $p<.001$
Commitment to judgment	5.90	5.18*	5.08*	4.71*	8.30, $p<.001$

Note. * = differs from the Incest story at $p<.05$.

Contrary to the expectations, however, there was little difference in the use of gut feelings vs. reason in assessing the drug story and the Mazda story (Table 6). Incest was

the sole story for which participants relied more on gut feelings than on reason, and since it differs significantly from the other stories in its heavy reliance on gut feelings, the incest story is contrasted with the other stories in the analyses that follow. First, an omnibus test of the effects of story will be presented, followed by a testing of differences between incest and each of the other three stories.

Basic Judgments

What the siblings did in the incest story was rated as wrong to a significantly greater degree than the acts involved in the other stories (Table 7), Heinz' not stealing the drug for his wife being rated as the least wrong. To obtain a measure of how much the ratings changed during the discussion of each story, a change score was calculated, the initial ratings being subtracted from the final ones, positive change scores indicating participants to have rated the stories as worse than before after having discussed them with the experimenter. Participants' judgments changed most in this respect for the Heinz story, although starting off at a low score.

As in Experiment 1, there was an effect of story on response time, participants needing more than twice the time to come to a judgment on the Heinz story than on the incest story. A similar pattern was found for the degree of commitment, participants feeling significantly more committed to their judgment on the incest story than on the other stories, the judgment of the Heinz story being the lowest in commitment. Correlations between the ratings of how wrong the act in question was and response time were also calculated, in a within-story analysis, no significant correlations being found except for a negative one for the incest story (r = -.45, $p < .001$), high ratings of wrongness there being coupled with short response times.

Argument Variables

Table 8 shows three of the "signs of dumbfounding" coded from the videos to have been significantly more common for the incest story than for the other three stories (or than two of them in one case), the three signs of this sort being how many times participants said "I-don't know", the number of unsupported declarations (statements such as "It's just wrong!"), and the number of think pauses (points at which the participant, despite its being his/her turn to speak, is quiet for several seconds, as though seeking for reasons).

Table 8

Mean Numbers of Signs of Dumbfounding

Variable	Incest	Drug	Mazda	Heinz	*F*
I-don't-knows	1.00	.59*	.37*	.78	3.24, $p<.03$
Unsupported declarations	.78	.10*	.16*	.04*	15.97, $p<.001$
Think pauses	1.29	.71*	.71*	1.14	4.73, $p<.004$
Disfluencies	2.06	1.90	2.06	2.27	1.09, n.s.
Dead-ends	.06	.14	.22*	.12	1.56, n.s.

Note. * = differs from the Incest story at $p<.05$.

There was no effect of stories, however, on how often participants had difficulties speaking or in putting their thoughts into words ("disfluencies"), or on the amount of dead-ends (stopped-and-dropped arguments).

The quality of the initial argument to support the judgment and of the arguments that followed was found to be significantly lower for the incest story than for the other stories (Table 9). There were no significant differences between stories, however, in the number of persons who used the escape phrase, although analysis of the time elapsed until the escape phrase was used showed that participants who used it did so more rapidly during discussion of the incest story than of the other stories.

Table 9

Ratings of Argument Quality and use of the Escape Phrase

Variable	Incest	Drug	Mazda	Heinz	*F*
Argument quality (1st reason)	2.22	2.78*	2.53*	2.69*	4.75, $p<.003$
Argument quality (whole story)	2.24	2.71*	2.76*	2.59*	5.03, $p<.002$
% who used escape phrase	71	67	67	59	$\chi^2=2.92$, n.s.
Time to escape (seconds)	183	223*	205*	203*	4.64, $p<.006$

Note. * = differs significantly ($p<.05$) from the Incest story.

Effects of Cognitive Load

Manipulation check. As a check on whether the cognitive load manipulation had the intended effect, participants were asked to rate how much having to hold the number in their head affected their ability to think and reason about the stories.

Table 10

Means of Reported Load Interference

	Incest		Drug		Mazda		Heinz	
	Load condition							
Variable	low	high	low	high	low	high	low	high
Reported interference	1.96	3.92	2.08	3.36	2.21	3.32	2.22	3.60

Although means were low overall, for each of the stories the degree of interference reported was greater for participants in the high-load condition than for participants in the low-load condition (Table 10), a repeated-measures ANOVA with load condition as a between-subjects variable yielding significance, $F(1, 47) = 15.28$, $p < .001$.

Table 11

Effects of Cognitive Load on Response Time and Argument Quality

	Incest		Drug		Mazda		Heinz		
	Load condition								
Variable	low	high	low	high	low	high	low	high	*F*
Response time	2.83	2.64	4.18	4.39	3.10	2.92	6.55	5.80	.63, n.s.
Argument quality (1st arg.)	2.63	1.84	3.21	2.36	2.96	2.12	3.13	2.28	41.7, p<001
Argument quality (overall)	2.33	2.16	3.00	2.44	2.88	2.64	2.54	2.64	.59, n.s.

Argument variables. No effect of cognitive load on participants' self-reported use of gut feelings vs. reason in their judgments was found, $F(1, 47) = 1.03$, $p < .32$ (no table), and as predicted no effect on the time it took them to provide a judgment or an evaluation was found either (response time, Table 11). However, cognitive load did significantly affect the quality of the initial argument, participants under high load producing less cogent arguments than those under low load. For the arguments as a whole, including both the initial argument and the later arguments, this was not found to be the case (argument quality overall, Table 11).

Load overall had little effect on the dumbfounding variables (Table 12). Contrary to predictions, load was not found to have an effect on use of the escape phrase. The only significant finding obtained, that for the "I-don't-knows", was opposite to what had been predicted, these being more frequent in the low-load than in the high-load condition.

Table 12

Effects of Cognitive Load on Signs of Dumbfounding and use of Escape Phrase

	Incest		Drug		Mazda		Heinz		
	Load condition								
Variable	low	high	low	high	low	high	low	high	*F*
I-don't-knows	1.33	.68	.88	.32	.42	.32	1.13	.44	4.66, $p<.036$
Unsupported declarations	.88	.68	.04	.16	.13	.20	.04	.04	0, n.s.
Think pauses	1.46	1.12	.50	.92	.75	.68	1.29	1.00	.89, n.s.
Disfluencies	2.21	1.92	1.75	2.04	1.96	2.16	2.25	2.28	.34, n.s.
Dead-ends	.13	.00	.17	.12	.33	.12	.25	.00	2.34, $p<.13$
% who used escape phrase	.71	.72	.67	.68	.71	.64	.58	.60	χ^2, n.s.
Time to escape (seconds)	178	187	238	209	223	186	219	187	1.10, n.s.

Discussion

The aim of Experiment 2 was to test further the hypothesis that moral judgment is based on intuition rather than on reason. The Heinz story turned out to be a prototypical reasoning story, one in which participants relied more on systematic reasoning than on intuition, whereas the incest story was found to be a prototypical intuition story. Although the drug story and the Mazda story failed to lead to the expected use of intuition vs. reasoning, the pattern of findings obtained in Experiment 1, in which signs of dumbfounding were more common for the incest story than for the Heinz story, was replicated, and was further corroborated by the finding that participants who used the "escape phrase" so as to give up the discussion did so more quickly for the incest story than for the other stories.

The cognitive load manipulation however failed to show the predicted effects of more signs of dumbfounding and shorter times to giving up the discussion when pressed for reasons. Although the fact that greater load both decreased argument quality and increased reported interference tells against the interpretation that the load was not strong enough, it is conceivable that load effects were the strongest only during the few seconds following each increment. Since participants were always asked to increment their number before giving the initial argument, this would also explain why initial but not overall argument quality was affected by load. The failure of load to affect reaction time is of particular interest in that one could well expect a high load to slow down systematic processing (reasoning), but automatic processes (such as intuition) to be unaffected by it. A rationalist model of moral judgment would predict a response-latency effect of load on moral judgment, at least for the Heinz story, and the present finding might be interpreted as judgments having been made quickly and automatically, whereas the moral reasoning (the 1st reason given) was highly affected by load.

General Discussion

Participants in the present study were often clearly dumbfounded by the moral intuition stories and by the non-moral intuition tasks (roach and soul), whereas they did not appear to be dumbfounded by the traditional moral reasoning story, Heinz. The most salient sign of dumbfounding would be that people who are dumbfounded will tell you so, and say things such as "I know it's wrong, but I just can't come up with a reason why". Participants who did this also tended to report being more confused, to rely more on "gut feelings" than on reason, and made more dead ends, unsupported declarations, and

exclamations. The fact that one can hold a moral judgment without supporting reasons for it suggests the judgment to have been made intuitively, as was also reported by the participants themselves. It thus appears important that research on moral judgment take both systematic reasoning and implicit processes into account rather than attending to simply the former, as has generally been the case. There is nothing in the present data to contradict the idea that systematic and intuitive processes can work in parallel, or that either process can be used to a certain extent in the judgment process without being used exclusively. Although the dynamics of "dual processes" of this kind have been studied in other fields of psychology (Chaiken & Trope, 1999), there is apparently no such work in moral cognition.

Nisbett and Wilson (1977) theorized that people generally do not have, and perhaps never have, access to the cognitive processes involved in making judgments, arguing that people tend to make ex post facto guesses regarding what caused them to make a particular judgment, guesses which are based on the most salient information they have available. Margolis (1987) argued that judgment usually involves a quick, intuitive "seeing-that", followed by a critical, ex post facto "reasoning-why", in order to explain why one came to the conclusion one did. The present study provides support for the theory that moral judgments, at least for such a taboo-oriented matter as incest, are based on an intuitive, perhaps "Humean" feeling of rightness or wrongness, which is followed by a "reasoning-why" based on the most salient features of the situation. One can argue that Kohlberg found moral reasoning to be so central since the dilemma stories he used provided a very salient fodder for post hoc "reasoning-why" in terms of rights and harm (cf. Kohlberg, 1969). When there is no such readily available material out of which one can construct a satisfactory "reasoning-why", i.e. when intuition finds no reason, one tends to be dumbfounded. Future studies of moral judgment processes should thus sample moral issues to a greater extent than has been generally done, so as to include different domains of morality, not simply those concerning justice-oriented morality.

It can be argued that the short response times for the intuitive stories presented here were not an effect of the taboo-oriented issues involved eliciting intuitive reactions, but rather was an effect of the stories being considered more wrong, this resulting in faster judgment. Such a claim receives some support from the finding in Experiment 2 of a negative correlation between wrongness ratings and response time for the incest story. However, response time was not found to be affected by how wrong the acts were seen as being for any of the other stories. Further investigation of this matter is needed, therefore.

It would also be of interest to study what specific aspects of various acts lead them to be rated as wrong, for example through studying moral issues from a value perspective, as Biel, Fransson and Dahlstrand (1997) have done, or to study whether manipulation of the information processing mode used (intuitive vs. systematic) can affect judgments of wrongness.

The study of dumbfoundedness, arising through mental processes of "seeing-that" conflicting with mental processes of "reasoning-why", can be seen as part of an emerging paradigm in social psychology, where certain recent findings and the models associated with them emphasize the importance of implicit processes in social cognition (Chaiken & Trope, 1999; Greenwald & Banaji, 1995; Wegner & Bargh, 1998). A similar development can be found in cognitive psychology, where implicit processes have been found to be common in decision making (Klein, 1998) and have been studied extensively in the area of learning (Stadler & French, 1998). Some evidence has also been gathered for Reber's (1993) idea that societal norms and mores are learned implicitly (Lewicki, Czyzewska & Hill, 1997). Several recent findings in neuropsychology suggest that the capacity of making intuitive judgments evolved at an early stage in human development. LeDoux (1993) found information to be evaluated emotionally in a network in the amygdala, before it reaches the neocortex to be processed consciously. Damasio (1998) studied quick and unpleasant gut feelings, which he called somatic markers, that alarm the body of possible negative outcomes, thus decreasing times required for decisions and judgments through the exclusion of some of the options that are logically possible. Although Damasio's research is not directly related to moral judgment, Batson, Engel and Fridell (1999) have succeeded in affecting value judgments by means of providing false somatic-marker related feedback. The findings briefly reviewed here coupled with the findings of the present study point to the importance of studying implicit processes in moral cognition

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Appendix A

The five situations used in Experiment 1

1) The Heinz Dilemma:

In Europe, a woman was near death from a very bad disease, a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium for which a druggist was charging ten times what the drug cost him to make. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." So, Heinz got desperate and broke into the man's store to steal the drug for his wife. Was there anything wrong with what he did?

2) The Cannibalism Story:

Jennifer works in a medical school pathology lab as a research assistant. The lab prepares human cadavers that are used to teach medical students about anatomy. The cadavers come from people who had donated their body to science for research. One night Jennifer is leaving the lab when she sees a body that is going to be discarded the next day. Jennifer was a vegetarian, for moral reasons. She thought it was wrong to kill animals for food. But then, when she saw a body about to be cremated, she thought it was irrational to waste perfectly edible meat. So she cut off a piece of flesh, and took it home and cooked it. The person had died recently of a heart attack, and she cooked the meat thoroughly, so there was no risk of disease. Is there anything wrong with what she did?

3) The Incest Story:

Julie and Mark, who are brother and sister are traveling together in France. They are both on summer vacation from college. One night they are staying alone in a cabin near the beach. They decide that it would be interesting and fun if they tried making love. At very least it would be a new experience for each of them. Julie was already taking birth control pills, but Mark uses a condom too, just to be safe. They both enjoy it, but they decide not to do it again. They keep that night as a special secret between them, which makes them feel even closer to each other. So what do you think about this? Was it wrong for them to have sex?

4) The Roach Task:

Experimenter asks: Do you like apple juice?

if "Yes": Good.

if "No" : OK, then, I have some water.

Experimenter brings the appropriate beverage, a napkin, a cup, the roach container, and the tea ball to table. OK, I have here a (can of apple juice/carton of spring water), which I'm going to pour into this glass [*pours it into glass*]. Would you be willing to take a sip of the juice/water? [*waits for S to take sip*]. OK, now I have here in this container some sterilized cockroaches. We bought some cockroaches from a laboratory supply company [*shows box and label*]. The roaches were raised in a clean environment. But just to be certain, we sterilized the roach again in an autoclave, which heats everything so hot that no germs can survive. I'm going to dip this cockroach into the juice/water, like this. Now, would you take a sip of the juice/water?

5) The Soul Task:

Experimenter says: I have a piece of paper here. If you agree to sign it, I'll give you two dollars, for real. If you sign it, you can then rip up the paper immediately, and keep the pieces yourself. So take a look at this [*hands S the "contract", which says:*].

I, _____,

hereby sell my soul, after my death,

to _____,

for the sum of _____.

_____

(signed)

Note: This form is part of a psychology experiment.
It is NOT a legal or binding contract, in any way.

Appendix B

The changed Heinz story and the two new stories used in Experiment 2

1) The Heinz story:

In Europe, a woman was near death from a very bad disease, a special kind of cancer. There was one drug that the doctors thought might save her. It was a form of radium for which a druggist was charging ten times what the drug cost him to make. The sick woman's husband, Heinz, went to everyone he knew to borrow the money, but he could only get together about half of what it cost. He told the druggist that his wife was dying, and asked him to sell it cheaper or let him pay later. But the druggist said, "No, I discovered the drug and I'm going to make money from it." Heinz was desperate, and he thought about breaking into the man's store to steal the drug for his wife. He knew he could pick the lock, without causing any other damage to the store, and he knew the courts would be lenient when considering his case. But he thought it was wrong to break the law, so he decided not to steal the drug. His wife died.

What do you think about this, did Heinz do something wrong, or was it OK?

2) The Mazda story:

Nick is moving to Australia in two weeks, so he needs to sell his 1993 Mazda ZRX. The car has only 40,000 miles on it, but Nick knows that 1993 was a bad year for the ZRX. Due to a manufacturing defect particular to that year, many of the ZRX engines fall apart at about 50,000 miles. Nevertheless, Nick has decided to ask for $5000, on the grounds that only one-third of the 1993 ZRX's are defective. The odds are two out of three that his car will be reliable, in which case it would certainly be worth $5000. Kathy, a woman that Nick knows from his neighborhood, has come over to see the car. Kathy says to Nick: 'I thought I read something about one year of the ZRX being defective. Which year was that?' Nick gets a little nervous, for he had been hoping that she wouldn't ask. Nick is usually an honest person, but he knows that if he tells the truth, he will blow the deal, and he really needs the money to pay for his move to Australia. Nick decides to lie to Kathy, but before he can say anything, Kathy says 'Oh never mind, that was 1992, I remember now. By 1993 they got it all straightened out'. Nick does not correct her, and they close the deal. Nick leaves the country, and never finds out whether his car was defective.

What do you think about this, did Nick do something wrong, or was it OK?

3) The Drug story:

Sally is research chemist at a major pharmaceutical company. She designs and tests psychiatric drugs, such as those used to control schizophrenia. Sally first got interested in this field in college, when she began experimenting with drugs. She became fascinated with the way that chemicals can alter the mind. She is still fascinated, and one of the great pleasures in her life is taking LSD. She only takes it a few times a year, for recreational purposes. She makes the LSD herself, at home, using chemicals and equipment that she is able to order, legally, from chemical supply companies. She never gives or sells the drug to anyone else. When she takes LSD she is always alone, listening to music in her house, over the weekend. After such weekends, she feels recharged and creative.

What do you think about this, did Sally do something wrong, or was it OK?