Proposal for a Study on the Influence of Motivation on Conscious Versus Unconscious Deliberation

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Background

Considerable debate exists about the ability of the unconscious mind to perform cognitive tasks often performed at a conscious, explicit level, such as reasons-based decision-making. Unconscious Thought Theory (UTT) is at the center of this debate, claiming that unconscious deliberation improves the outcome of making a complex decision. UTT assumes that deliberation can and does occur at a subconscious level; in this context, deliberation is presumed to occur while subjects engage consciously in an unrelated verbal task interposed between presentation of the task and the request for a decision. Subjects in other conditions either make their choice immediately after exposure to the options or after several minutes of conscious deliberation where they are asked to think about the task.

Dijksterhuis et al. (2006) provide evidence for UTT in a study in which subjects were happier with purchases of complex products when their decisions had been made in the absence of attentive deliberation, and in another where subjects' choice of the "best" car between cars with differing numbers of positive attributes were more normatively accurate. This finding, however, has not been upheld by replication (Newell et al., 2008), and has been challenged theoretically in the context of other research on conscious and unconscious processing (see Gonzalez-Vallejo et al., 2008). Studies by Newell et al. (2008) found that in all conditions (immediate choice, conscious deliberation, unconscious deliberation), subjects prefer the item congruent with the choice predicted by pilot subjects' highest sum of weighted attribute ratings. Newell et al., however, did find a recency effect in decision-making that was most pronounced in the unconscious

deliberation condition. This suggests that the choice task may involve online updating of options throughout task presentation, since subjects know that they will later have to make a decision in the absence of the information the currently have direct access to. Instead of providing evidence of unconscious reasoning, therefore, differential task performance may simply reflect order effects of memory in the unconscious processing condition. There is thus no definitive evidence that the unconscious mind aids in processing complex decision tasks while the conscious mind is otherwise occupied.

In contrast to level of conscious processing, affect and motivation have consistently been found to affect decision-making. Ditto and Lopez (1992) showed that information that supports a favored conclusion is examined less critically than information inconsistent with the preferred conclusion, such that less information is required to reach the preferred conclusion. Similarly, when after taking a personality inventory subjects were given identical bogus personality profiles and diagnostic feedback about resistance to future problems, subjects who received unfavorable feedback compared to favorable feedback rated their diagnoses and personality description as less accurate and generated more reasons to support the inaccuracy of their diagnosis (Ditto & Boardman, 1995). And although subjects in another study rated favorable and unfavorable outcomes on a medical test equally likely for *others*, they perceived their own unfavorable result as less likely than a favorable result and required more time to accept the result as valid (Ditto et al., 2003). Social psychologist Ziva Kunda dubbed such influence of goals and desires on reasoning "motivated reasoning." Studies of motivated reasoning suggest that affect and motivation

may influence the mode of processing used in reasoning, such as using shortcuts versus more systematic reasoning strategies (Social Cognition).

While it is not clear that unconscious processing helps us make "better" decisions when weighing positive and negative attributes of an item, it is possible that other influences on decision-making might exert differential influence on conscious and unconscious decision-making processes (and in so doing provide evidence that unconscious reasoning actually occurs). Traditionally, the unconscious mind has been thought of as a less rational, more primal entity than the conscious mind; Freud described the unconscious mind as the "id" that contains our most basic desires and motivations. If the unconscious mind does not add appreciably to our reasons-based decision-making, perhaps it still exerts influence on our decisions that are affectively or motivationally driven. Indeed, Zajonc associated consciousness with cognitive operations and unconscious processes with affective judgments (in Gonzalez-Vallejo, 2008), and discovered the 'mere exposure' effect, that after processing stimuli, subjects may be unable to recall the stimuli but can still make reliable, more positive affective judgments corresponding to the stimuli they observed.

An interesting question thus arises: might unconscious deliberation show more or less influence of motivation on decision-making than conscious deliberation, relative to immediate choice? This study investigates this question by asking subjects to evaluate the quality of two different studies when one study outcome is subjectively preferable (subjects would prefer this result to have positive truth value). By manipulating level of conscious processing using the methods of Dijksterhuis et al. (2006), we will see whether

motivation differentially affects conscious and unconscious deliberation, and also whether this method can provide any evidence of unconscious deliberation.

Methods: Study 1

Subjects will be 40 undergraduates from the University of California, San Diego randomly enrolled from the department subject pool, *Experimetrix*. Subjects will told that the goal of the study is to evaluate undergraduates' ability to asses the strengths and weaknesses of real psychology studies to inform departmental teaching of the topic, and that there is also an unrelated study about strategies in solving word puzzles. Data on subjects' age, year in school, and gender will be collected. Subjects will then be presented with information about two studies to read about. The methodology of Study B will be superior to the methodology of Study A, but the difference will be complex enough to require some thought (pilot studies will ensure that this is the case). Each study will also state its conclusion; the two conclusions will be attached to each study design in a counterbalanced way such that half the subjects see the favorable conclusion attached to Study A (weaker design) and half see it attached to Study B (stronger design). One conclusion supports the idea that students should be treated as adults and that supervision in dorms and citations for alcohol use should be minimal. The other concludes that college-aged students make extremely poor decisions related to alcohol use, and should have high degrees of oversight and harsh consequences for alcohol policy violations. Pilot data will ensure that the vast majority of subjects favor the latter study conclusion (the study conclusions will be modified until this is the case; for the purposes of this proposal we will assume that the

current materials suffice), providing subjects with a motivation to prefer whichever design this conclusion is attached to.

Subjects will be randomly assigned to one of three conditions (immediate choice, conscious deliberation, or unconscious deliberation). All subjects will be told to "examine the following information about two recently conducted studies and think about the quality of their methods." Subjects will not be told explicitly at this point that they will be asked to make any judgments about the study methodologies. After one minute the information will be removed. In the immediate choice condition subjects will immediately be given the questionnaire. In the conscious deliberation condition subjects will be told "we will ask for your opinion about the study designs later. Please think about them for a few minutes." Subjects are presented with the questionnaire 5 minutes later. Finally, in the unconscious deliberation condition, subjects will be told "we will ask for your opinion about the study designs later. Right now we are going to do some word puzzles for a few minutes." Subjects are given 5 minutes to complete anagrams, then presented with the questionnaire. The questionnaire asks subjects to rate the quality of the design and methods of each study (in counterbalanced order) on a Likert scale ranging from 1-10 (see Materials section). The order of rating the two studies will be counterbalanced and independent of the order in which they were presented.

Materials: Study 1

	Study A	Study B
Subject recruitment	Subjects were drawn from undergraduate psychology courses to participate for	Random selection of students contacted by mail at beginning of freshman

	course credit in "a study about student success and alcohol use."	year to participate in "a study of student experiences." Participation incentive of gift card to campus bookstore.
Number of subjects	855	403
Source of subjects	University of Virginia, Georgia State, University of Oregon	3 East Coast, 2 South, 1 Midwest, 2 West Coast
Data collection points	Data collected from students once; college year varied between subjects.	Data collected from the same students in their freshman and senior years
Data collected from subjects	Age, sex, GPA -Ethnicity -Religion -Home state -Rating of happiness -Average number of drinks per week -Perception of school oversight on alcohol use	-Age, sex, GPA -Number of close friends -Satisfaction with college experience -Number of times subjects interact with dorm staff per week -Binge drinking questionnaire
Data collected from schools	-Number of alcohol-related emergencies reported in campus newspaper -Average size of dormitories -Average number of staff per dormitory	-Staff ratings of how strictly they monitor dorms and how strictly they deal with alcohol policy violations -Number of events of alcohol poisoning or hospitalization -Survey of attitudes towards student alcohol consumption
Conclusion	(C or D)	(C or D)

Conclusion C: Correlation between student success and happiness with lack of oversight and regulation of alcohol use. Recommends minimal college supervision of alcohol consumption.

Conclusion D: Correlation between student success and happiness with higher oversight and regulation of alcohol use. Recommends high college supervision of alcohol consumption.

Questionnaire Front:

1. On the following scale, please rate the design and methods of Study A.

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10

1 = Invalid methodology. No conclusions can be drawn 10 = Perfect methodology. No flaws apparent

2. On the following scale, please rate the design and methods of Study B.

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10
1 = Invalid methodology. No conclusions can be drawn 10 = Perfect methodology. No flaws apparent

Questionnaire Back:

Please rate your own opinion about whether alcohol consumption of undergraduates should be highly regulated:

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10
No regulation Very strict oversight and punishment

Analysis: Study 1

A 2(Favorable conclusion attached to Study A or Study B) × 3(Condition: immediate, unconscious deliberation, conscious deliberation) ANOVA will be performed to determine the main effect of a favorable conclusion and its interaction with level of conscious processing.

Methods: Study 2

Study 2 attempts to motivate subjects more directly by making the study conclusions bear directly on their identity. The methods are the same as Study 1 except for the following information. The study conclusions are that men (Conclusion G) or women (Conclusion H) are superior at a visual search task. Gender is a good variable to manipulate because it is easy to recruit subjects in equal numbers from each gender and because gender is typically a clear and meaningful component of identity. Individuals like to believe that they belong to superior, desirable groups and thus are generally motivated to believe that positive traits are associated with their gender. This time, we will assume that the preferable study outcome will be the conclusion that the subject's gender is superior at the visual search task.

The same rating scales will be administered to subjects to rate the design of the two studies. No follow-up questions will be asked, however.

Materials: Study 2

	Study E	Study F
Subjects	8-10 year old children recruited from two elementary school classes in Boston, MA with the incentive of receiving a free "Where's Waldo" book	Adults ages 20-50, recruited from subway exits in New York City and offered a $5 gift certificate to Starbucks for participation
Number of subjects	40 (12 girls and 28 boys)	34 (16 men and 18 women)
Experimental data	Subjects were called out of class and timed individually on how quickly they could find Waldo in each of four pictures. The pictures were selected randomly from two Waldo books from the classrooms' bookshelves.	Subjects were taken to a nearby intersection and asked to find a different store sign (a coffee shop, a jeweler, a shoe store, and a video shop) on each of four trials. If subjects were familiar with the intersection, their data were dropped from the study.
Other data collected from subjects	Age, sex	Age, sex, visual acuity test
Conclusion	(G or H)	(G or H)

Conclusion G: This study concluded that males have superior visual search skills to females.

Conclusion H: This study concluded that females have superior visual search skills to males.

Analysis: Study 2

A 2(Gender-congruent study conclusion attached to Study A or Study B) × 3(Condition: immediate, unconscious deliberation, conscious deliberation) ANOVA will be performed to

determine the main effect of a favorable (subject's gender is superior at visual search) conclusion and its interaction with level of conscious processing.

Discussion

This study tests a novel prediction about conscious versus unconscious processes: that motivation may differentially affect reasoning at conscious and unconscious levels of processing. While on balance research on unconscious deliberation thus far fails to validate UTT, other differences in outcome of reasoning, such as influence of motivation at conscious and unconscious levels, have not been investigated. Based on historical beliefs about the unconscious mind there is good reason to think that motivation might influence reasoning more through unconscious deliberation. If this were found to be true, it would demonstrate that, contrary to Newell et al., online updating of options throughout task presentation is not a sufficient model for all conscious/unconscious deliberation tasks and that there are unconscious deliberation processes that influence decision outcomes. This will provide evidence that the unconscious mind aids in processing complex decision tasks while the conscious mind is otherwise occupied. If no such effect of motivation is found, the burden of proof will remain with UTT related theories to show that unconscious deliberation has any effect on reasoning.

Limitations of this study include assumptions about which study outcome subjects will prefer (hopefully pilot testing will eliminate such concerns) and the assumption that these preferences create enough motivation to affect reasoning if such an effect exists. A null finding may indicate further investigation using stronger motivation, such as heterosexual and homosexual subjects with study outcomes suggesting that homosexual partners make

good versus bad parents. Another limitation is that the task may not have enough external validity; subjects enrolled in a study for obligatory course credit may have little motivation to give much effort on the reasoning task to begin with. External validity will also be more limited if students do not accept the assertion that the studies are real studies, not just fake stimuli, as is actually the case. Another limitation is that performance may depend greatly on task construal. If subjects interpret the task as a challenge to actively suppress motivated reasoning, they may perform differently than if this task interpretation had not occurred to them. However, people often engage in reasoning tasks with the explicit demand of choosing the objectively best option (best car, best applicant, best house), and potential affective and motivational influences on judgment are ubiquitous in such situations (friends' opinions of cars, advertising, gender or race of applicant, street name of house reminds you of your childhood nemesis, etc). This task is no different and is in fact a situation that commonly arises in the practice of experimental psychology, where researchers are presented with the challenge of objectively evaluating studies without being influenced by their theoretical motivations or personal opinion of the authors. Hopefully, in spite of these limitations, this study will enhance our understanding of unconscious deliberation and the affects of motivation on reasoning.

Works Cited

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