

ABSTRACT

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PARAMETERS IN MOTIVATED BIASES IN
HUMAN JUDGMENT

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Motivational and cognitive factors can determine the extent and direction of information processing in judgment. When biasing motives are present, information can be distorted and judgment biased. The extent of this bias can be determined by the nature of the information, the relative magnitude of competing goals, and the individual's cognitive resources. Studies 1, 2 and 3 explored the effect of resource depletion on motivated distortions in judgment. Studies 4 and 5 examined the role of relative goal magnitude (of a biasing goal vs. a specific judgment goal) in the phenomena. I departed from the assumption that human knowledge is malleable, and that its alteration in a motivationally desirable direction may vary in difficulty across instances. It was assumed that overcoming the difficulty requires cognitive and/or motivational resources hence under certain circumstances resource-depletion should diminish individuals' ability to motivationally bias judgments. I also hypothesized when information is clear-cut (rather than ambiguous) making distortion difficult, a

sufficient amount of biasing motivation could overcome the “reality constraints,” holding the cognitive resources constant.

In my first two studies participants’ resources were depleted either via complex or simple presentational format of the information given (Study 1), or via engagement in a fatiguing prior activity (Study 2). In the third study (Study 3), I measured participants’ stable cognitive capacity as a proxy for their available cognitive resources. All three studies provided supportive evidence for the hypothesis that motivated distortion is resource dependent. In Study 4 I manipulated the relative goal magnitude by experimentally increasing goal importance for either an academic success goal in line with the specific judgment task or a social wellbeing goal as the biasing goal. In Study 5 I altered relative goal magnitude through enhancing either a neutral goal or health concerns as the biasing goal. In both Study 4 and 5, orthogonal to the relative goal magnitude manipulation, stimulus ambiguity was made either high or low. Findings from Study 4 and 5 supported the hypothesis that sufficient magnitude of biasing goal could overcome distortion difficulty even in highly constraining circumstances.

COGNITIVE AND MOTIVATIONAL PARAMETERS IN MOTIVATED BIASES
IN HUMAN JUDGMENT

By

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Chapter 1: Introduction

The notion that human judgments are susceptible to motivational biases has been long entertained by social scientists. Early in the 20th century, Vilfredo Pareto (1916), the Italian economist and sociologist, contended that human behavior in the service of real motives (called ‘residues’) is distorted to appear in the service of fictitious motives (called ‘derivations’) (see Allport, 1968, pp. 21-22). The notion of motivated distortions was particularly central to Sigmund Freud’s (1920) concept of *defense mechanisms*. According to Freud, the unconscious Id, driven by the “pleasure principle,” is the source of a person’s motivational forces, originating from instinctual drives. The Ego, in contrast, represents the “reality principle,” and embodies the perception of the world as it is. Defense mechanisms are psychological processes that step in where motivational concerns (stemming from the “pleasure principle) clash with the realities at hand. To deal with the conflict and quell the anxiety it engenders, defense mechanisms bend individuals’ perceptions of reality to forms that gratify the Id-based motivational concerns as well. In so doing, the defense mechanisms resolve the conflict between concerns for *pleasure* and *reality* and effect their joint satisfaction. Therefore, Freud’s defense mechanisms actually propose possible ways in which motivated distortions of reality may occur.

For instance, the mechanism of “repression” involves the suppression/inhibition of undesirable or motivationally inconsistent information. As a consequence, persons might be unable to recall or imagine threatening situations that may befall them, and construct their realities in agreeable, optimistic, terms. A related defense mechanism, according to Freud, is “denial,” wherein motivationally

incongruous facts are refused acceptance. An extreme case of denial is a widow's negation of her husband's death despite incontrovertible facts (Stroebe, Hansson, Stroebe & Schut, 2001; Hansson & Stroebe, 2007) or terminally ill patients' refusal to recognize (what to others constitutes) undeniable portends of their impending demise (Kübler-Ross, 1969).

A yet different defense mechanism elaborated by Freud is "rationalization." It involves interpreting a motivationally incongruent outcome (e.g., rejection by an object of one's infatuation, or failure at an important task) by adducing arguments that the outcome is not really that undesirable after all (e.g. by convincing oneself that the rejecting individual was not really worthy of one's affection, or that the task really was not that important in a larger scheme of things).

Social Psychological Research on Motivated Biases

Cognitive consistency theories. In social psychology, notions of motivated distortion were paramount in the influential cognitive consistency theories of the 1950s and 1960s (for a source book, see Abelson et al., 1968). In Festinger's (1957) cognitive dissonance theory, for example, aversive tension was assumed to arise when willful behavior was at odds with an actor's attitudes or cherished values (e.g., Steele, 1988). Such tension was seen to stem from an incompatibility between the individual's cognitions (that one performed an act at odds with one's attitudes) and motivation (e.g., the desire to think of oneself as a principled human being whose behavior is consistent with her or his attitudes and values). To alleviate the tension, attitude change occurs that removes the discrepancy between one's (now adjusted) attitude and one's behavior.

In Heider's (1958) balance theory, the motivation to maintain consistency among one's cognitions was seen as the driving force behind cognitive alteration of one's attitudes and beliefs aimed at producing relations that are harmonious and balanced, e.g. a perception that one's cherished friends concur with oneself with respect to important issues, etc. (for a discussion, see Kruglanski & Klar, 1983).

Attribution theory. The concept of motivated distortion has appeared in another influential framework of the 1960s and 1970s, namely attribution theory (Kelley, 1967; 1972, Jones et al., 1972). Motivational biases in attribution were assumed to prompt causal assignments congruent with one's wishes and desires. For instance, in research by Johnson, Feigenbaum and Weiby (1962), participants acting as teachers imputed their students' success to themselves and the students' failure to the students. Kelley (1967) interpreted this and other similar findings in motivational terms, namely as reflecting participants' tendency to enhance and/or protect their self esteem by making esteem consistent attributions.

Motivated reasoning. The topic of directional biases stemming from one's wishes and desires occupied central stage within the *motivated reasoning* paradigm (Kunda, 1990; Dunning, 1999). Studies of this genre were carried out in the 1980s and the 1990s and examined a broader range of biases than did the cognitive-consistency and attribution frameworks. For instance, Kunda (1987) found that participants desirous of academic achievement recalled more of their academic successes than failures, and used their world knowledge to spin theories about how their unique personality characteristics may facilitate academic attainments. In a similar vein, Kunda and Sanitioso (1989) found that people led to believe that given

personality traits are conducive to academic success came to think that they possessed those traits to a greater extent, compared to the control participants for whom no such belief was established. In other research, participants informed that tooth brushing or caffeine consumption was unhealthy, reported lower incidence of those activities than participants informed that these behaviors were beneficial to health (Ross, McFarland & Fletcher, 1981; Sherman & Kunda, 1989).

Research by Dunning and his colleagues found that people are quicker in recognizing a given trait as positive if they believed that they possessed it (Bauregard & Dunning, 1998; Dunning, Perie & Story, 1991). In one study, Dunning, Leuenberger and Sherman (1995, Study 2) manipulated success or failure with a test of integrative orientation. Those who experienced failure (vs. success) and were therefore more motivated to restore their self esteem and articulated more self-serving theories of success (linking success with traits they believed to own) than those experiencing success (for reviews of the motivated reasoning literature see Kunda, 1990; Kunda & Sinclair, 1999; Dunning, 1999).

The aforementioned research attests that, social psychologists' interest in motivated biases is extensive and longstanding, constituting a persistent theme in the field's research agenda from the 1950s to the present. Yet, despite the considerable body of research devoted to this topic, there has been relatively little systematic exploration of conditions that may affect motivated biases and/or determine their extent. The preponderance of studies in this domain were aimed at demonstrating that motivated biases are authentic rather than spurious or susceptible to non-motivational (i.e. cognitive) rival interpretations. Related to this is the well-known controversy

between proponents of dissonance and self-perception theories (Bem, 1967; 1972) as to whether the results of dissonance studies (e.g., Festinger & Carlsmith, 1959) represent a motivated bias or an inference drawn from one's own behavior and the conditions under which it occurred.

The hypothesis of motivated biases in attribution (Johnson, Feigenbaum & Weiby, 1962; Kelley, 1967) has also been challenged from a cognitive perspective. Specifically, it has been argued that actors often expect to be successful in their endeavors given their investments of efforts and abilities. Whereas the occurrence of success is consistent with and hence readily attributed to such an expectancy, which results in a self-attribution, the occurrence of failure is inconsistent with the expectancy, which prompts an external attribution (for discussion see Miller & Ross, 1975).

The issue of whether motivational biases are genuine has been largely put to rest by clever experimental work within the motivated reasoning paradigm (c.f. Kunda, 1990; Dunning, 1999). Perhaps the most compelling evidence for their authenticity came from studies wherein the provided information was identical for all participants and the only factor that varied was participants' directional motivation. For instance, Sanitioso, Kunda, and Fong (1990) asked participants to generate autobiographical memories on the introversion-extraversion dimension. Participants led to believe that introversion is a highly desirable trait recalled introverted instances first and generated a greater number of introverted (vs. extraverted) instances, whereas participants led to believe that extraversion was desirable exhibited the opposite pattern of recall. In another study by Klein and Kunda (1992), in which all

participants were provided with identical information about another person's performance on a history quiz, participants whom believed the individual would be a future partner rated the person as better at history compared to participants whom believed the person would be their future opponent.

There is also evidence that motivated biases are not limited to esteem concerns. Ditto, Jemmott, and Darley (1988) and Jemmott, Ditto, and Croyle (1986) found that participants "diagnosed" as having a (fictitious) enzyme deficiency rated it as less serious and threatening to their health than did participants diagnosed as being free from the deficiency. Those given the positive (vs. negative) diagnosis also evaluated the diagnostic test as being less reliable and accurate. In so far as the participants were unlikely to possess any prior information about the test or the disease, these results are generally viewed as attesting to a motivated bias.

Dunning (1999) examined the results of other similar studies from his own lab (e.g. Beaugard & Dunning, 1998; Dunning et al., 1995), concluding that "the traditional counter-explanations for motivational effects (based on background information, information conveyed by experimental manipulations, self presentational concerns) failed to account for the results of these experiments" (Dunning, 1999, p. 8). Similarly, Kunda (1990, p. 493) stated that "the case for motivated reasoning appears quite strong... The position that all [motivated] biases are due to purely cognitive processes is no longer tenable." This conclusion seems to be generally accepted in the field today (for discussion see Kruglanski, 1996).

The Role of Stimulus Ambiguity

Despite such recognition and the manifest occurrence of motivated biases across a broad range of tasks, motivations, and circumstances¹ the understanding of factors that may facilitate or inhibit such biases is still limited. The one factor that received considerable amount of attention in this regard is *stimulus ambiguity*. Specifically, it has been predicted and found that motivational biases are more likely to appear when the judgmental situation is ambiguous and open to multiple interpretations and less likely to appear when the situation is relatively clear cut and straightforward.

For instance, Dunning, Meyerowitz and Holzberg (1989) found that people are more likely to rate themselves as above average on ambiguous (vs. unambiguous) traits open to multiple construals such as ‘friendly’ and ‘creative’, but not unambiguous traits such as ‘intelligent’ and ‘punctual’. Additional studies, too, reveal that people’s susceptibility to motivational biases is constrained by their prior knowledge. In a study by Kunda and Sanitioso (1989), participants led to believe that either introversion or extraversion is conducive to academic success, judged themselves accordingly to be more introverted or extraverted. Nonetheless, the extraverts still viewed themselves as significantly more extraverted than the introverts. “In other words, the effects of the manipulation on self-concepts were constrained by prior self-knowledge” (Kunda, 1990, p. 485). Kunda (1990) further interpreted the relatively small motivational effect reported by Dunning, Story and Tan (1989) as possibly reflecting the fact “that changes in self ratings were constrained by prior self-knowledge” (ibid).

¹Including but not restricted to conditions specified in dissonance theory, i.e., to the commission of a willfully committed counterattitudinal act yielding aversive consequences [cf. Linder, Cooper & Jones, 1967; Cooper & Fazio, 1984].

Another example of the notion of stimulus ambiguity and its role in motivated biases is Hsee's (1996) concept of "elasticity." According to Hsee, "elasticity in justifiable factors" refers to "the possibility of interpreting those factors in multiple ways...where different justifiable factors have different values and the relative weights among those factors are ambiguous" (Hsee, 1996, p. 124). Hsee (1996) found that when the information provided is "elastic" (e.g., one option is better than another on some features and is worse on other features), individuals *distort* their evaluation of the elastic "justifiable" factors (e.g., competitors' relative standings, job candidates' relative competence, houses' relative advantages and disadvantages) in the direction of the motivational, "unjustifiable" factor (e.g. the nationality of the pianist, the looks of the job candidates, hypothetical fiancé's involvement in the choice alternatives), and then make biased judgments that, although explained only by referencing the justifiable factors, in effect are influenced by the unjustifiable factors as well.

One study that explicitly manipulated information ambiguity/clarity (through relative quality of different products) and found that clear cut (rather than ambiguous) information was not distorted was conducted by Kruglanski et al. (Kruglanski, Chun, Sleeth-Keppler & Friedman, 2005, Study 3). In this study participants were told to taste three soda drinks and pick the best quality one. The manipulated biasing goal was to identify or dis-identify with the American culture. Among the three drinks "Coke" was shown (in a pilot study) to be instrumental to the goal of identifying with the American culture more than "Pepsi". Participants were also presented with a third drink, a "Shoppers Cola". In the study's "superior" condition (but not the "inferior"

condition) where “Shopper’s Cola” was obviously superior in its quality to “Coke” and “Pepsi” the ‘*focal override*’ effect was observed. In other words, irrespective of the biasing goal participants preponderantly considered the Shoppers Cola as the tastiest drink of the three: “When participants’ focal goal [the goal to make accurate judgment] clashed with their background objectives [the biasing goals], the latter were quickly sacrificed allowing the consciously pursued objective to prevail” (Kruglanski, et al., 2005). However, in the “inferior” condition where Shopper’s Cola was poorer tasting than Coke or Pepsi (that tasted the same), the choice between the latter two was driven by the goal of identification or disidentification with America. Specifically, Coke was preponderantly chosen in the identification condition, and Pepsi in the disidentification condition. For the purpose of the current paper, the ‘focal override’ effect in this study shows that distortion is not likely to occur when the information is clear cut and reality constraints are high (i.e., in the “superior” condition) versus when the stimulus is ambiguous and reality constraints are low (i.e., in the “inferior” condition).

In summary, the idea that present information and/or prior knowledge constrain motivational biases is based on converging empirical evidence from several independent lines of research. Researchers agree that the stronger such constraints - that is, the less ambiguous or “elastic” the knowledge - the lesser individuals’ ability to bias their judgments in motivationally desirable directions.

The Role of Resources in Motivated Distortion

The notion that cognitive resources are required for the extensive elaboration of information has been previously formalized in Petty and Cacioppo’s (1986)

Elaboration Likelihood Model of persuasion (ELM). The ELM posits that if one is motivated to render an objective judgment, cognitive resources will be employed (in the form of cognitive elaboration) toward this end. However, the ELM also allows for the possibility that cognitive resources can be employed toward biased cognitive elaboration if a biasing motivation is present. ELM postulate 5 says “Variables affecting message processing in a relatively biased manner can produce either a positive (favorable) or negative (unfavorable) motivation and /or ability bias to the issue-relevant thoughts attempted” (Petty & Cacioppo, 1986). This principle was rephrased in another paper, “A wide variety of variables can affect a person’s motivation and ability to consider issue-relevant arguments in either a relatively objective or in a relatively biased manner” (Cacioppo et al., 1986, pp. 1037). In above quotes, message processing as well as consideration of issue-relevant arguments is “central” processing according to ELM. Since central processing takes cognitive resources these quotes mean that central processing (of the message content) can be biased (e.g., resulting from a likable source) and cognitive resources can be employed for this biased central processing – biased elaboration of the message arguments. Building on this perspective, I will presently explore in greater detail the specific role of resources in the phenomenon of motivated distortion.

To begin with, I assume that all beliefs or forms of subjective knowledge are, in principle, alterable. The notion that human knowledge, scientific as well as lay, is potentially unstable and subject to change has been the mainstay of philosophical approaches (e.g. Kuhn, 1962; Popper, 1959; Feyerabend, 1975) and psychological analyses alike (e.g., see Kruglanski, 1989; Petty & Cacioppo, 1986). This implies that

the constraints (on motivational biases) imposed by prior knowledge are not rigid or fixed; rather, they can be overcome under the appropriate circumstances. The question, therefore, is when and how this occurs. Three categories of factors appear to be of relevance here: (1) The inherent difficulty of overcoming the constraints in a given instance, (2) the individual's cognitive resources and (3) motivational resources that he or she may bring to bear on overcoming those constraints.

The *difficulty* of overcoming “reality constraints” may hinge on a variety of conditions. In fact, that is why *stimulus ambiguity* is germane to one's ability to effect motivated distortions. Specifically, stimulus ambiguity is one way in which information may be easier to distort: Presumably, clear cut information requires considerable effort to explain away, counter-argue, or repress, whereas ambiguous information is easier to “spin” in a motivationally desirable direction. Additionally, however, the difficulty of distortion may be determined by a host of factors other than stimulus ambiguity (e.g., the length and complexity of the information given, the modality with which it is presented, its being embedded in a noisy versus noiseless informational environment, etc.). Thus, in identifying the stimulus ambiguity/clarity variable as a special case of distortion difficulty (rather than as a critical variable *in and of itself*) it is possible to identify other, heretofore unexplored, conditions that affect distortion difficulty and hence the likelihood and/or magnitude of motivated distortions.

That *distortion difficulty* plays a significant role in motivational biases is consistent with the view that the process involved in such biases may be quite laborious. For instance, Festinger (1957), in discussing dissonance reducing attitude

change, referred to it as “cognitive *work*”, that is, effort required to change one’s attitude in a motivationally desirable direction. Furthermore, Festinger assumed that attitude change takes place precisely because attitudes are *easier* to alter than cognitions about the dissonant behavior which occurrence is hard to deny. In this sense, the voluminous research on dissonance-prompted attitude change (for a recent review see Harmon-Jones & Mills, 2004) provides indirect evidence that distortion difficulty matters, and that the easier path to distortion is often preferred over the more difficult way.

Also consistent with the view that the difficulty of distortion matters is research by Wood, Kallgren, and Preisler (1985), who found that participants with greater access to attitude-relevant information in memory, that is, participants for whom it should have been *easier* to generate motivationally-congruent construals generated more negative thoughts in response to persuasion attempts and were less persuaded by counter-attitudinal, hence motivationally undesirable, messages than were less knowledgeable participants.

Kunda’s (1990) influential review of evidence for motivational biases in judgment identifies two mechanisms that potentially mediate such distortions, both likely varying in their degree of difficulty across circumstances: (a) biased memory search for beliefs and rules that support the desired conclusion, and (b) creative combination of the accessed knowledge to construct novel beliefs that could logically support such a conclusion. It seems plausible to assume that difficulty of distortion should depend on how hard such a memory search, and/or belief construction is for an individual in a given instance. For example, if arguments congruent with the

desired conclusion are highly accessible, distortion should be relatively easy compared to a case wherein these arguments are less accessible or downright unavailable (Higgins, 1996).

I assume, however, that even information that is difficult to distort may be distorted nonetheless if the individual has a sufficient degree of motivation and/or cognitive resources. Intriguing anecdotal evidence exists that people who are extremely strongly motivated to reach given conclusions can distort what to others may appear as undeniable realities. As I mentioned earlier, Stroebe et al., (2001) recount anecdotes of widows whom, for all intents and purposes, denied the reality of their husbands' deaths. Similarly, Kübler-Ross (1969) recall cases of terminally ill patients' who, to the very end, negated the incontrovertible evidence (to others) of their approaching death. These observations suggest that the sheer *magnitude* of the biasing motivation may constitute one determinant of individuals' ability to overcome the "reality constraints" imposed by present information or prior knowledge.

Even more intriguing is the possibility that the occurrence of motivated distortion may depend on one's available cognitive resources. Specifically, accomplishment of the potentially laborious "work" that a distortion requires may be impossible to carry out without adequate cognitive resources. Depletion of such resources by concomitant activities and/or by prior fatiguing tasks may render the distortion task too difficult to carry out. In other words, when the individual is cognitively busy or depleted, motivational biases may be unlikely to occur. Work described below puts this hypothesis to empirical test.

Chapter 2: The Role of Cognitive Resources

The first three experimental studies in the present series were carried out to investigate the effect of resource depletion on motivated biases. All three studies used the same paradigm wherein the motivation to distort and resource depletion were varied orthogonally to each another. These studies differed, however, in the manner in which resource depletion was operationally defined. In the first study, resource depletion was accomplished via the complex (hence resource-demanding) versus simple presentation of the information. In the second study, depletion was accomplished by a prior fatiguing (vs. less fatiguing) task. Finally, the third study measured participants' stable individual differences in cognitive capacity, assumed to constitute a significant cognitive resource available for distortion. The description of these studies and their results are given next.

Section 1

Study 1

Overview. All three studies varied participants' motivation to distort using a priming technique. In one condition, participants were primed with stimuli designed to enhance their goal to identify with their university (the University of Maryland), whereas in another condition they were primed with stimuli designed to enhance the goal of accuracy. Cross cutting the motivational variable, Study 1 varied the presentational format of the information to make it more or less resource depleting. Information given to participants contained the fabricated results of an alleged intercollegiate track and field meet in which the University of Maryland (UMD)

competed against Duke University; the results indicated that Duke University slightly outperformed UMD. In the low depletion condition, the information was summarized briefly in form of a table. In the high depletion condition the information was presented via a relatively lengthy narrative. I assumed that the lengthy narrative information would drain participants' cognitive resources, leaving less residual resources available for distortion. Thus, I expected that a bias in participants' recall of the athletic results in favor of UMD would be more pronounced in the low (vs. the high) depletion condition, but particularly so in the identification (vs. the accuracy) goal condition, resulting in a statistical interaction between the two independent variables.

Method

Participants

One hundred and thirty two University of Maryland undergraduate psychology students (72 women, 50 men) were recruited to participate in a study on "Cognition and Social Judgment." Partial course credit was awarded to students in exchange for taking part in this study. Participants' gender did not yield any effects on the dependent variables hence it will be omitted from further consideration.

Procedure

Participants first engaged in a lexical decision task (the procedure used for goal priming) during which they were subliminally primed with either 12 words relating to the University of Maryland (e.g., terps, terrapins, Testudo)² or 12 accuracy

² These words were selected on the basis of a pilot study wherein participants, UMD students, generated words they associate with UMD. A second sample of students rated on a Likert scale the extent to which each of the words was associated with UMD. Out of the most

related words (e.g., accurate, correct, true). In the lexical task, which was irrelevant to the motivational manipulation, participants were asked to indicate whether the letter strings they viewed constituted meaningful words. Some of the letter strings were neutral words (e.g. chair) while others were pronounceable nonwords (e.g. pind). Prior to each letter string, the primes were presented for 17ms, backward masked. It was expected that the Maryland primes would activate their UMD identity and thus the directional motivation to favor their own university in the following task, whereas the accuracy related words were expected to enhance the accuracy motivation. A funneled debriefing procedure tapped participants' awareness of the priming stimuli. No participant reported any suspicion or awareness of the content of the primes.

At this point, participants were given the following information: "The Atlantic Coastal Conference (ACC) is testing procedures for granting an award to one university each year for overall track and field achievements. Below is information about the performance of University of Maryland and Duke University. The scores reflect performance across many different track and field events, and the ACC would like to come up with a way to rate the overall performance."

Participants were then presented with the track and field performance of each university, either in an easy to read table (see Table 1) or in more difficult to process sentences, as follows:

"In the relay race, Maryland finished in 6th place and Duke finished in 3rd. In the discus, Maryland finished in 1st and Duke finished in 6th. In the sprint Maryland finished in 5th and Duke finished in 2nd. In the hurdles Maryland finished in 3rd and

frequently mentioned words in the sample, 12 were selected that received the highest association scores, on average.

Duke finished in 3rd. In the decathlon, Maryland finished in 5th and Duke finished in 3rd. In the javelin, Maryland finished in 3rd and Duke finished in 5th.”

Table 1

Information presented in the low-information-processing-demand conditions

<u>Event</u>	<u>Maryland</u>	<u>Duke</u>
Relay Race	6th	3 rd
Discus	1st	6th
Sprint	5th	2 nd
Hurdles	3rd	3rd
Decathlon	5th	3rd
Javelin	3rd	5th

To reiterate, I assumed that the informational format in which the athletic results were given in a table form was low in processing demands thus leaving ample residual resources for distortion, compared to the same information when presented in the narrative format. Overall, the information presented to participants objectively favored Duke over UMD. Specifically, of the 6 events listed 3 favored Duke and only 2 favored UMD. Thus, I hypothesized that in the presence of resources the directional bias in favor of their university would decrease the *accuracy* of our participants' judgments.

Finally, after the informational materials were taken away from them, participants were asked two questions tapping the extent to which they thought UMD or Duke was more deserving of the award. Specifically, these questions were: (1)

Maryland should win the award over Duke, and (2) Duke should win the award over Maryland (reverse scored). Answers were recorded on 9-point Likert scales anchored with endpoints 1="Disagree very strongly" and 9="Agree very strongly."

This concluded the experiment. Participants were subsequently thoroughly debriefed and thanked for their participation.

Results

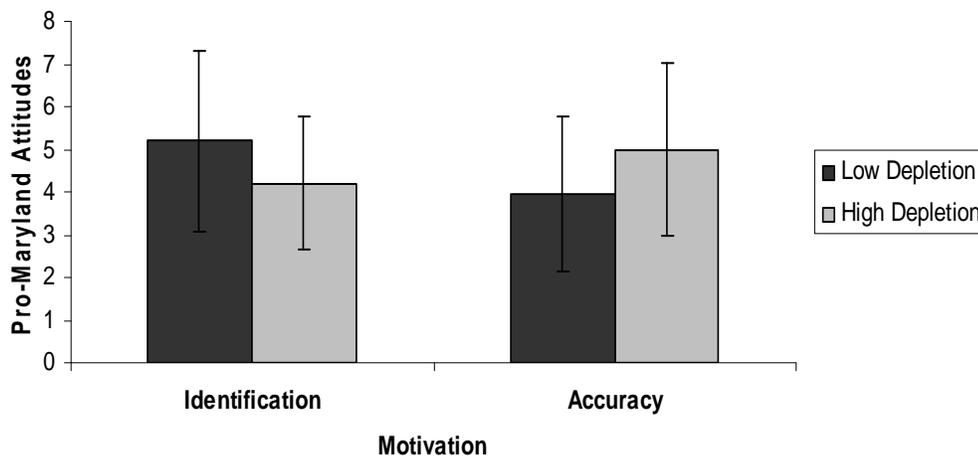
Manipulation check: A 2 (motivation: accuracy vs. identification) X 2 (information processing demand: table vs. narrative) ANOVA revealed a significant main effect of information processing demand on the item "*It was difficult to read the information,*" $F(1,128) = 5.526, p = .02$. As expected, participants presented with information in the narrative form reported experiencing a greater amount of reading difficulty ($M = 5.93$) than participants presented with the same information in a table form ($M = 5.13$).

To make sure the two informational formats (i.e., tabular vs. narrative) did not differ in their perceived clarity/ambiguity, I had both formats initially rated by 16 undergraduate UMD students (eight students rated each format). To avoid arousing particular directional motivations, the school names were changed from the University of Maryland and Duke to Georgetown University and Virginia Tech. Results from this pilot study showed that students given either version rated the information as equally clear/ambiguous in terms of "which school had better overall performance."

Judgment of award allocation: Responses to the two questions regarding the award allocation were highly correlated, $r(130) = .90, p < .001$, hence I combined

them via simple averaging to generate a single index of allocation. Consistent with the prediction, a 2 (motivation: accuracy vs. identification) X 2 (information processing demand: table vs. narrative) ANOVA performed on these results revealed a significant two-way interaction between motivation and residual resources, $F(1,128) = 9.65, p < .005$. As shown in Figure 1, participants primed with the UMD identity distorted the information more in the direction of UMD winning the award when the information was easy to process ($M = 5.2, SD = 2.12$) than when the information was difficult to process ($M = 4.2, SD = 1.57$). A t -test revealed this difference to be statistically significant $t(128) = 2.12, p < .05$. Also as predicted, under accuracy priming there was no evidence of motivated distortion. In fact, the mean in the difficult to process condition was significantly *higher* ($M = 5.0, SD = 2.01$) than that in the easy to process condition ($M = 3.96, SD = 1.80$), $t(128) = -2.28, p < .05$.

Figure 1. The effect of resource depletion and magnitude of background motivation on Pro-Maryland attitudes



Discussion

The results of Study 1 provide preliminary evidence that cognitive resources matter when it comes to motivated distortion of judgments. Specifically, when participants were primed with UMD terms assumed to augment their goal to identify with their university, they distorted their judgments in a direction favorable to UMD, but only when the information on which their judgments were based was presented in a non-resource depleting tabular form. In contrast, no motivated distortion appears to have occurred in the identification condition, when the information was more demanding of cognitive resources and hence more depleting. It is of interest that the present findings are not explainable by stimulus ambiguity or elasticity (Hsee, 1996; Kunda, 1990). First, the pilot data suggest that the informational clarity did not differ between the table format versus the narrative format conditions. Second, one could expect that, if anything, the narrative information should be more ambiguous than the straightforward tabulated information. Yet it was with the tabulated but not the narrative information that distortion occurred. These results are compatible with the present analysis in terms of the resource depletion hypothesized to occur in the narrative, difficult to process condition.

Despite these encouraging results, the first study is open to an alternative interpretation. Specifically, the narrative condition could have been more involving to the participants for some reason; this might have increased their desire for accuracy, accounting for the absence of distortion in this condition. To address this concern, the second study employed a constant presentational format across conditions and varied

resource depletion in an alternative manner, via a prior task that participants were asked to perform.

Section 2

Study 2

Overview. Like Study 1, the present experiment utilized a 2 x 2 factorial design in which the same motivational variable (biasing vs. accuracy goal) was varied orthogonally to the degree of resource depletion. Just as in Study 1, the motivational manipulations were accomplished via subliminal primes embedded in a lexical decision task. Also like in Study 1, the primary dependent variable involved judgments of award deservingness by UMD and Duke on basis of information about their athletic accomplishments in a track and field competition. However, the manner of depleting participants' resources differed from that in the preceding study. Instead of depleting participants' cognitive resources via informational format, all participants were provided with the tabulated (hence easy to process) information format of Study 1 and resource depletion was varied by having participants perform a prior cognitive task that was more or less demanding depending on the experimental condition. I expected that in the identification (with UMD) condition participants' tendency to give motivationally biased judgments in favor of UMD would be greater when the prior cognitive task they performed was less versus more demanding. Prior task demands were not expected to affect participants' judgments in the accuracy goal condition.

Method

Participants

Forty-four UMD undergraduate psychology students (29 women, 15 men) received partial course credit in exchange for their participation in the study. Participants' gender did not yield any significant effects hence it will be omitted from subsequent discussions.

Procedure

Upon arrival at the lab, participants were told that they would participate in two unrelated short studies. They first performed a Stroop task, ostensibly to explore how people learn to carry out this particular cognitive activity. Upon their completion of this task, participants were escorted to a second lab, allegedly to complete the "second," unrelated study, which contained the critical judgment task of present interest.

The Stroop task had participants state aloud the color of presented text which itself spelled a given color name. The color of the text either coincided or did not coincide with the color being spelled out. That is, green text could spell the color name 'green,' but it could also, for example, read 'blue.'" In the former case, the presented and the spelled colors coincide, making the task relatively easy to perform. In the latter case, the presented and the spelled colors differ, creating a response conflict and requiring participants to inhibit the automatically elicited response indicated by spelled information. The need to inhibit an automatic response to the text renders the Stroop task difficult and resource demanding, causing attentional fatigue (Kaplan, 2001).

To vary resource depletion, I used two versions of the Stroop task. In the easy version, 10% of the trials presented incongruent words and colors, whereas in the

difficult version 90% of the trials were incongruent. In both cases, participants had to perform the test for the same amount of time, 15 minutes. I assumed that after performing the difficult (vs. the easy) version of the Stroop task, participants' cognitive resources would be more depleted, with less residual resources remaining for potential distortion. Pretesting the two versions of the Stroop task confirmed these expectations, as undergraduate psychology students reported significantly more fatigue after performing the difficult (vs. easy) version of the Stroop task.

As already noted, priming the identification and the accuracy goals was accomplished in the same way as in Study 1, via subliminal priming with relevant stimulus words in the context of a (conceptually irrelevant) lexical decision task. All participants were then given the same cover story about universities' deservingness for an athletic award, just as in Study 1. After reading the information, participants were asked to render judgments on the same items as in Study 1, which marked the end of the experiment. Participants were then fully debriefed and thanked for their participation.

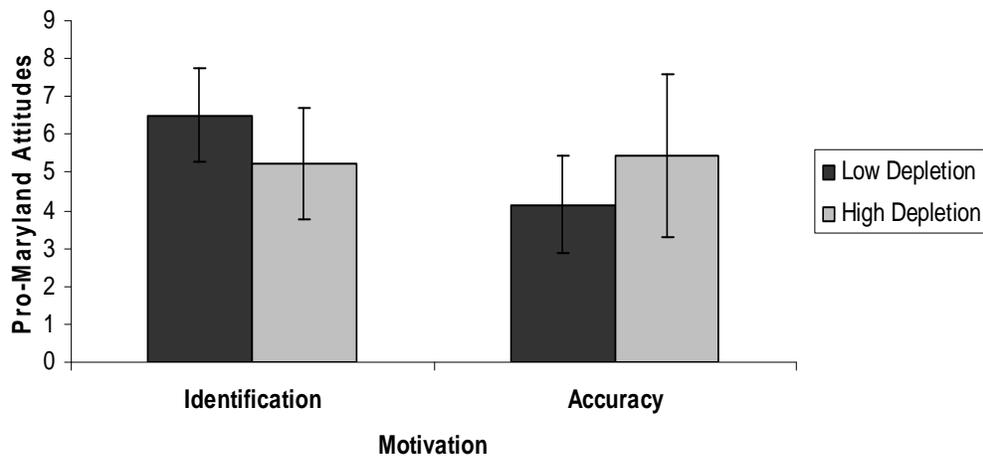
Results

Judgment of award designation: Responses to the award deservingness items were highly correlated, $r(42) = .76, p < .001$, hence I combined them via simple averaging into a single score. An ANOVA performed on these data yielded a main effect for goal prime, such that those primed with their Maryland identity favored Maryland ($M = 5.9$) more than those primed with accuracy ($M = 4.8$), $F(1, 40) = 4.62, p < .05$. More importantly, the predicted two-way interaction between the two

independent variables (i.e., identification vs. accuracy prime and high vs. low level of manipulated depletion) was found, $F(1, 40) = 6.51, p < .05$.

As shown in Figure 2, participants primed with the identification words were more biased toward UMD in the low depletion condition (i.e., when they performed the relatively easy Stroop task) ($M = 6.50, SD = 1.23$) than in the high depletion condition (after performing the relatively difficult Stroop task) ($M = 5.23, SD = 1.46$), $t(40) = 1.89, p = .07$. However, when participants were primed with the accuracy words, the trend was in the reverse direction ($M = 4.15, SD = 1.27$ for the low depletion condition; $M = 5.43, SD = 2.14$ for the high depletion condition), $t(40) = -1.73, p = .09$.

Figure 2. The effect of residual cognitive resources and magnitude of background goal on Pro-Maryland attitudes



Discussion

The results of the second study both conceptually replicate and extend those of its predecessor. As in Study 1, the present study obtained findings consistent with

the idea that motivated distortion is resource dependent. Specifically, when participants were motivated to identify with their university and “bask in its glory,” they exhibited ingroup favoritism by overvaluing the performance of their university team, but only when their resources were relatively intact (under low prior depletion) as opposed to depleted (in the high depletion condition). Thus, independently of whether resource depletion was effected via concurrent degree of processing complexity (as in Study 1) or via prior engagement in a fatiguing activity (as in Study 2), it appears to have restricted the participants’ ability to carry out the motivationally desired distortion.

Importantly, the findings of this study reduce the likelihood that the results of Study 1 had to do exclusively with informational format and with the possibility that the lengthier, narrative form created a higher degree of accuracy motivation than the briefer tabular format. Indeed, the present results show that the same informational format (the tabulated format of Study 1) that under ample resource conditions was subject to distortion did not afford distortion under reduced resource conditions. This suggests that factors affecting the likelihood of distortion go beyond the informational stimulus per se and the distortion difficulty that it poses (e.g., related to informational ambiguity/clarity and the degree of constraint that one’s prior beliefs exert), and include the individual’s processing resources as a likely moderator of motivated biases.

Despite the apparent convergence of their findings in support of the present analysis, both preceding studies might be subject to an alternative interpretation in that it is possible that the resource depletion manipulations affected the participants’

motivational states (e.g., by reducing the distortion *motivation* in the high versus the low depletion condition). If so, the observed reduction of distortion effects in the high depletion conditions of the two studies might have been mediated by declined motivation to distort rather than by cognitive depletion. To address this alternative interpretation, rather than reducing participants' cognitive resources experimentally, the third study *assessed* the presence of cognitive resources as a dimension of *individual differences*. It is rather unlikely that participants who stably differed in their cognitive resources would react differently to the same motivational manipulations and hence unlikely that the assessed resource variable would contaminate the motivational inductions in some way.

Section 3

Study 3

Overview. To investigate individual differences in cognitive capacity, Study 3 assessed individuals' working memory capacity using an O-SPAN test (Turner & Engle, 1989). O-SPAN test has been shown to have high internal consistency (.75) and reliability (.88) and is stable across time (Klein & Fiss, 1999). The automated version of the test was used for the study. This test was run on a computer and was entirely mouse driven. It contained practice and actual test with the practice consisting three sections: letter span, math problem solving and the combination of both. During the practice letter span section, participants saw letters appear on the screen one at a time, they then must recall these letters in the same order as presented. Each letter remained on screen for 800ms. Participants recalled by clicking the box next to the appropriate letters. After each recall, the computer provided feedback

about the number of correct recalls. In the subsequent math section, participants received math operations (e.g., $(1*2) + 1 = ?$) and after each problem they saw a number (e.g., “3”) and were required to judge if the number was correct solution by clicking on “True” or “False”. After each math operation participants received feedback. The program calculated the individual’s mean time required to solve the equations. In the final practice section which had the same format as the actual test, participants received sets of both the letter recall and math problems together. They first saw the operation and after solving it they saw the letter to be recalled. The actual test consists of 3 sets of each set-size, with the set-size ranging from 3 to 7 which makes for a total of 75 letters and 75 math problems. The O-SPAN score was used in Study 3 as an index of individual differences in cognitive resources. In all remaining procedural details, this study was identical to the preceding two experiments. Induction of the UMD identification and the accuracy goals was accomplished by priming, and the participants’ task was to judge the deservingness of UMD versus Duke for an athletic award based on their comparative performance in a track and field competition. In Study 3, I treated working memory capacity as a continuous variable and the goal manipulation (identification vs. accuracy) as a cross-cutting discrete variable.

Method

Participants

Fifty-five University of Maryland undergraduate psychology students (34 women, 21 men) participated in a study on “Social Judgment” in exchange for partial

course credit. Participants' gender did not yield any significant effects in this study hence it will be omitted from subsequent consideration.

Procedure

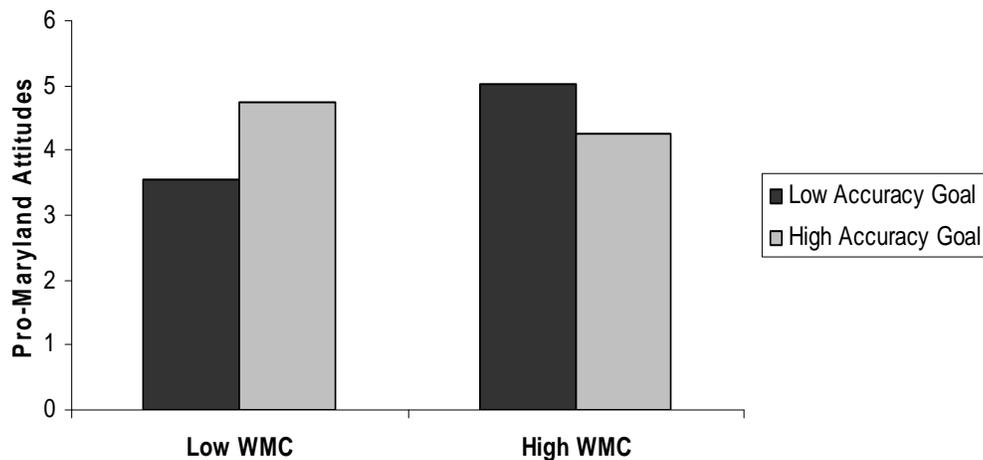
The O-SPAN task was administered to all participants at the beginning of each experimental session. Participants were then randomly assigned to one of the goal priming conditions where, as in Studies 1 and 2, either the accuracy or UMD-identification goal was primed subliminally. Participants were then presented with the same athletic performance information as in our two preceding studies; this time, all participants were presented with the narrative form of the information used in Study 1. After reading the information, participants were asked the same questions regarding UMD and Duke's performance as in Studies 1 and 2, which marked the end of the experiment. Participants were then fully debriefed and thanked for taking part in the study.

Results

As in Studies 1 and 2, responses to the items comprising the main dependent variable were significantly correlated, $r(53) = .63, p < .01$. Therefore, responses to these items were again combined via simple averaging to generate an overall deservingness score. I first performed simple regression analyses for each of the goal priming conditions. In the UMD identity priming condition, individual working memory capacity was a significant predictor ($\beta = .05, p < .05$) of the dependent variable. Specifically, when the background goal of favoring UMD was induced by priming UMD identity, the judgments of participants with high working memory capacity scores significantly favored UMD over Duke. However, when the accuracy

goal was primed, individual differences in working memory capacity yielded no significant difference ($p = .31$). A regression analysis was then performed to test the significance of the interaction between these two independent variables, with working memory capacity entered as a continuous variable and the motivational prime variable dummy coded. As shown in Figure 3, the regression revealed a significant interaction effect ($\beta = .07, p < .05$) in the direction consistent with the hypothesis: in the accuracy priming condition working memory did not yield a difference in the evaluation of UMD's performance relative to Duke's, while in the UMD priming condition higher working memory predicted a more positive evaluation of UMD's performance.

Figure 3. The interaction between working memory capacity and relative goal magnitude



Discussion

The results of Study 3 contribute an important piece of evidence to the investigation in that they indicate that the effects of cognitive resource availability on

motivated distortion are not limited to situational manipulations of resources but also pertain to stable individual differences in resources. Presumably, resources are required in order to process stimulus information; to the extent that such information is sufficiently complex (as may have been the case in the present narrative version of the relevant information), participants with less resources to start with are left with insufficient residual resources for motivated distortion. Whereas the situational manipulation of resources may also have affected participants' motivational states, this is highly unlikely with the present, measured, manner of operationalizing the resource variable. Such convergence of situational and individual difference measures is consistent with the present conceptual analysis and bolsters confidence in its plausibility.

Summary

The first three studies provide consistent support for various facets of the foregoing analysis. In Study 1, more (versus less) demanding information processing (assumed to be more resource depletive) resulted in a significantly lower degree of motivational bias in participants' judgments. In Study 2, the depletion of participants' resources via a prior resource-demanding activity similarly resulted in lower degree of motivationally congruent judgments. Finally, Study 3 conceptually replicated the findings of Studies 1 and 2, by showing that individuals endowed with more ample cognitive resources exhibited a significantly greater extent of motivated bias in their judgments than did their counterparts whom possessed a lesser amount of such resources.

Admittedly, each of the foregoing studies is open to alternative explanations that are rendered less plausible by subsequent studies in the set. The first study, in which I attempted to deplete participants' resources via presentational format, is open to the interpretation that this altered the participants' motivation by inducing a higher accuracy motivation in the complex information condition. This competing interpretation is ruled out in the second and third studies, which held the informational format constant (using the low demand format in Study 2, and the high demand format in Study 3). In addition, the manipulation of depletion via situational means in the first two studies is vulnerable to the alternative explanation that this also lowered participants' directional motivation to arrive at motivationally congruent judgments. This problem, generally likely to be present in any situational attempt to reduce individuals' cognitive capacity (e.g., by the imposition of cognitive load), is countered by the third study, which measured (rather than manipulated) cognitive resources as a dimension of individual differences.

Thus, the convergence of findings across all three studies controls for the specific alternative interpretations to which each study alone may have been vulnerable and supports the present theoretical analysis regarding of the role of cognitive resources in motivated distortion.

Chapter 3: Relative Goal Magnitude and Distortion Difficulty

Studies 1, 2 and 3 explored the role of the cognitive parameter, namely cognitive resources, in the process of motivated distortion. The second part of the present research was designed to more fully explore the effect of motivational magnitude on distortion in difficult (i.e., highly constraining) versus easy circumstances. In Studies 4 and 5 I focused on one specific source of difficulty in distortion and how a relatively strong biasing goal could overcome this difficulty. As

previously mentioned, although not much prior research has explored the moderating conditions under which motivated biases may occur, some emphasis has been placed on the effect of information ambiguity/clarity. Specifically, research has shown that biases are likely to occur when information is ambiguous (e.g., Kunda, 1990; Hsee, 1996, Kruglanski et al., 2005). When information is rather clear-cut (in terms of which judgment is accurate) and therefore ‘reality constraints’ are relatively high, accurate judgment is likely to be made despite the presence of a biasing goal (Kruglanski et al., 2005, Study 3). But is the effect of ‘reality constraints’ to be generally expected, or does it only manifest itself under specific conditions? What if the biasing goal were of a much higher magnitude for the individual than the goal in line with the specific judgment task? As noted earlier, there exists anecdotal evidence that highly motivated individuals (e.g., terminally ill patients, people who have lost beloved significant others) may deny these depressing facts, “hoping against hope,” that the desirable outcome will occur. Such evidence suggests that even relatively unambiguous stimuli that are “normally” resistant to distortion can be susceptible to distortion if the magnitude of the distorting motivation is appropriately high. Accordingly, Studies 4 and 5 tested the hypothesis that, holding the cognitive resources parameter constant, even highly constraining information may be subject to motivational bias if the biasing motivation is sufficiently strong.

Specifically, Study 4 examined the extent to which group-learning (seen as congruent with the biasing goal of social wellbeing) was rated as conducive to the goal of academic success whereas Study 5 examined people’s choice (taste preference) between two explicit judgmental options (two types of iced teas) under

conditions where a biasing goal of health was introduced. In both studies, stimulus ambiguity was manipulated to be either high or low. Specifically, in Study 4 group-learning was presented as either ambiguously effective/ineffective or clearly ineffective and in Study 5 the actual quality difference between the two teas was made either small (virtually zero) or relatively large. Research on ‘unconscious choice’ has shown that when the quality of alternative products is similar (i.e., the situation is ambiguous), biases in choice tend to occur in line with unconscious motivations (Nisbett & Wilson, 1977, Kruglanski et al., 2005, Study 1 & 2). However, when one product is clearly superior to the other(s) such biases have been demonstrated to disappear (Kruglanski et al., 2005, Study 3). Based on this evidence, when the two teas are of virtually the same quality stimulus ambiguity should be high and when one tea is clearly superior in taste than another stimulus ambiguity should be low.

As mentioned above, cross-cutting the stimulus ambiguity variable, Studies 4 and 5 varied the level of relative magnitude of a biasing goal to make it either high or low. In Study 4, either the explicit task goal or the biasing goal was made important situationally, and in Study 5 either a neutral goal or the biasing goal was enhanced. In contrast to Studies 1- 3, where goals were primed subliminally through a cognitive task, in Studies 4 and 5 goal magnitude was manipulated in a supraliminal manner via open-ended questions or specific items embedded in the experimental questionnaires.

Section 1

Study 4

Overview. Study 4 employed a 2 (low vs. high relative magnitude of biasing goal) X 2 (high vs. low stimulus ambiguity) factorial design. In this study, the judgment task was to rate the effectiveness of group study for achieving the goal of academic success, and *social wellbeing* served as the biasing goal. Operating under the assumption that all of our participants subscribed to some extent to both the academic success and the social wellbeing goals, the magnitude of each relative to the other was manipulated situationally via enhancement of one goal and not the other. This was accomplished by means of an open-ended question that focused on the importance of either social networks or good academic performance to one's career success, such that the relative magnitude of social wellbeing goal was made high in the former condition and low in the latter.

Stimulus ambiguity was manipulated by introducing either balanced information on the effectiveness of group-learning (high ambiguity) or only negative information on the effectiveness of group-learning (low ambiguity). According to Kunda's (1990) reasoning on the degree of difficulty involved in motivated reasoning, participants for whom both sides of an issue are readily available should have an easier time justifying favoring group study (i.e., rating it as effective) than participants for whom only information contradictory to the preferred judgment is made available.

Based on the foregoing analysis, it was expected that when balanced information on group-learning was presented, people would rate group-learning as more effective than when only negative information of group-learning was given.

However, this difference in rating between the two ambiguity conditions should attenuate or even disappear when the social wellbeing goal was enhanced.

Method

Participants

Ninety-four University of Maryland undergraduate psychology students were recruited to participate in the online survey study “College Life and Study Patterns” (63 women, 31 men).³ They received partial course credit in exchange for their participation in the study. Participants’ gender did not yield any significant effects in this study hence it will be omitted from subsequent consideration.

Procedure

Participants’ chronic goal importance for academic success and social wellbeing were first assessed through specific items in a questionnaire entitled “Things we care about at school.”⁴ Participants’ existing beliefs (i.e., before the manipulations in the study took place) as to the conduciveness of group study to both academic success and social wellbeing were also measured separately in the same questionnaire. The corresponding items were, “Studying with classmates and/or friends is an effective way to get good grades most of the time”, and “Study groups

³ A total of one hundred and sixteen students signed up for the study but responses for all open-ended questions from three students were random characters, therefore these participants were excluded from data analysis. Another nineteen students’ data were also excluded because they either did not answer questions that were the main variables in the study (n=2), or their answers to the goal magnitude manipulation question did not mention or reflect any importance of that particular goal (n=14), or their answers to the ambiguity manipulation were not in line with the probing arguments (n=3), such as they disagreed with all those arguments.

⁴ Items assessing the academic success goal were, “Having good grades in classes is important to me”, “I don’t care about learning knowledge/skills in my classes (reverse coded)”, and “GPA is not a big deal to me (reverse coded).” Items measuring the social importance goal included “Social life in college is important in my life”, “I really want to be popular among my peers in college”, “I think having romantic relationship(s) is important in college”, “I’d like to be a member of some sorority/fraternity in college”, and “I have an active social life.”

help me make friends at school”, respectively. These two measures were treated as covariates in the data analysis.

Answers to all questionnaire items were recorded on 6-point Likert scales with the endpoints labeled “strongly disagree” and “strongly agree”.

To eliminate the possibility that answering questions related to academic and social success would contaminate later parts of the experiment, a filler task, “Ethical Dilemmas,” was administered after the questionnaire. In this filler task, three ethical dilemmas (two given scenarios, one based on participants’ own experience) were presented and participants were asked to think about (in the first two scenarios) or recall (in the third, own experience scenario) how they would/did respond to the situation (Appendix A). I assumed that this task was fully engaging and different enough from the experimental questionnaire so that it successfully drew participants’ minds away from the earlier part the study.

Prior to the manipulation of the independent variables, to build/strengthen the link between group study and the social goal (i.e., building networks), a short paragraph was presented arguing that engaging in group study can be an effective way of building meaningful and lasting social networks in college (Appendix B). After reading this paragraph, participants were also asked to, “tell us, from your own experience how participating in study groups could help you build meaningful and lasting connections with other students.”

Next, relative goal magnitude was manipulated. The attention of participants in the low magnitude social wellbeing goal condition was focused on the academic success goal via the following open-ended question: “Think for a few minutes and

then write down what you want to do after graduating from college, and how good performance in your classes (e.g., earning a high GPA) could help? Do you agree that people who do well with their classes in college also tend to become more successful later in their lives?” In contrast, participants in the high magnitude social wellbeing goal condition were given the following instructions: “Think for a few minutes and then write down what you want to do after graduating from college and how social networks (e.g., with classmates) you build in college could help? Do you agree that people who are popular in college also tend to become more successful later in their lives?” Participants’ answers to these questions served as a manipulation check intended to investigate whether either the academic success or the social wellbeing goal, depending on the specific goal-focusing question, was indeed seen as important.

Following the manipulation of the relative goal magnitude, I experimentally varied the factor of stimulus ambiguity. In the high ambiguity condition an equal number of positive and negative arguments about group-learning were provided, while in the low ambiguity condition only disadvantages of group-learning were presented. The total number of arguments was kept constant for both conditions. In order to strengthen the impact of this manipulation, participants were also asked to provide an example for each of these argument drawn from their personal experience. Specific arguments and questions are given in Appendix C.

Next, came the question meant to tap the main dependent variable, namely: “Overall, how effective do you personally think group-learning is in achieving academic success in college?” responses to this item were recorded using a 7-point Likert scale format, with the endpoints marked “Extremely ineffective” and

“Extremely effective”. Afterwards, demographic information, including GPA, was collected and participants were provided with a debriefing sheet.

Results

Manipulation check: Participants’ answers to the open-ended question used to enhance either the academic success or social wellbeing goal served as a check for the relative goal magnitude manipulation. As expected, participants in the former goal condition explicitly stated in their answers to this open-ended question that good performance in classes or high GPA was important to them, while those in the latter goal condition described the importance of social networks in their lives. The manipulation check for stimulus ambiguity is discussed in the ANCOVA results.

Descriptive statistics: As shown in Figure 4, the dependent measure had a mean of 5.00 ($SD = .69$) under high stimulus ambiguity (i.e., low distortion difficulty) and a mean of 3.76 ($SD = 1.70$) under low stimulus ambiguity (i.e., high distortion difficulty), with a higher value indicating greater favoritism towards group-learning, when the academic success goal was enhanced. When the social wellbeing goal was enhanced, the mean value for the dependent measure was 5.00 ($SD = 1.04$) under high ambiguity and 4.58 ($SD = 1.02$) under low ambiguity.⁵

⁵ *Correlations:* Pair-wise correlations were calculated for all items tapping academic success goal and social wellbeing goal, the measures of people’s existing belief on the effectiveness of study group to getting good grades and on how helpful study groups help to make friends, GPAs, as well as the dependent measure. The resulting correlation matrix is given in Table 2. The dependent variable (i.e., how effective is group-learning to achieving academic success) is significantly correlated with four items: “having good grades is important” ($r = .29, p < .005$), “learning is important” ($r = .26, p < .05$), “studying with classmates/friends is effective to get good grades” ($r = .39, p < .001$) and “study groups help me make friends” ($r = .46, p < .001$), respectively.

A factor analysis was carried out on the questionnaire containing all items measuring academic success and social wellbeing goals for the purpose of data reduction. The two factors extracted appeared to represent the social wellbeing and academic success goals, respectively. Items with single loading greater than .50 were selected. This resulted in the selection of all three academic success items and three items on social wellbeing, including “Social life is important”, “Want to be popular”, and “I have

Figure 4. The effect of relative goal magnitude and stimulus ambiguity on perceived effectiveness of group-learning

an active social life”. Index variables –overall existing academic success goal and overall existing social wellbeing goal – were created by averaging the scores from each group of items. Neither the average existing academic success goal nor the average existing social wellbeing goal contributed significantly more to the variance in the dependent measure, beyond the variables already in the ANCOVA model. Therefore they were left out of the model. The variable of participants’ GPAs was not included in the model for the same reason.

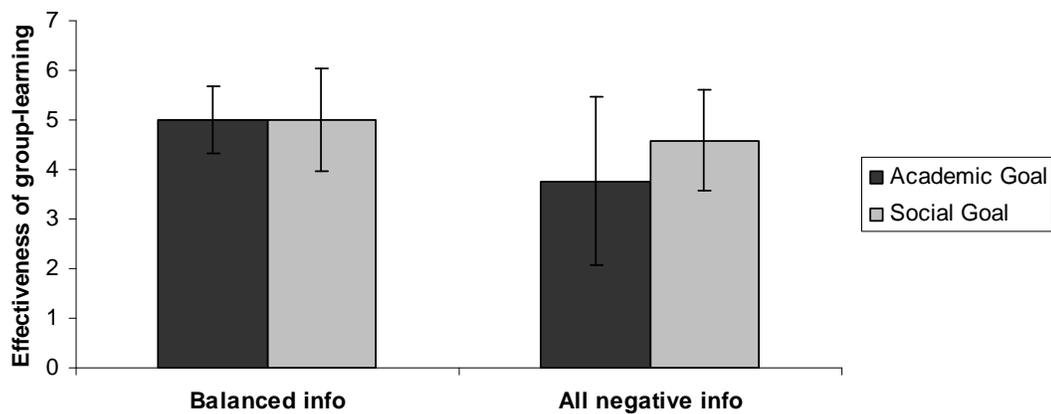
Table 2

Correlations between key items in the questionnaire in Study 4

	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
(a) Grades important		.30*	.59**	.19	.10	.06	.09	-.03	.17	.28**	.29**	.36**
(b) Learning important			.19	-.15	.09	-.12	-.06	-.06	-.02	.19	.26*	.07
(c) GPA important				.05	.03	.03	.02	.09	-.04	.25*	.20	.34**
(d) Social Life important					.16	.56**	.26*	.31**	.58**	.22*	.15	-.11
(e) Group Study effective						.08	.12	.12	.09	.35**	.39**	-.05
(f) Want to be popular							.17	.28*	.38**	.08	.03	-.05
(g) Romantic relation important								.14	.23*	-.02	-.03	.03
(h) Want to be Sorority/Fraternity member									.19	-.08	.15	-.11
(i) Active social life										.19	.07	.00
(j) Study Groups help make friends											.46**	.14
(k) Group-Learning effective												-.01
(l) GPA												

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).



Next, an ANCOVA was carried out to look at the effects of the two independent variables (i.e., relative goal magnitude and stimulus ambiguity) on the dependent measure. Two items, asked prior to the manipulations employed in the study, were entered as covariates as planned in the study design. These items assessed existing beliefs regarding the conduciveness of group study to both the academic success and social wellbeing. Specifically, these two items were, ‘Studying with classmates/friends is an effective way to get good grades most of the time’ and ‘Study groups help me make friends at school’.

Covariates: Results show that existing belief regarding the conduciveness of study groups to the social wellbeing goal (i.e., making friends) was a significant predictor ($F(1, 88) = 15.33, p < .001$) of the dependent measure. This indicates that people who believe study groups are conducive to their social wellbeing goal tend to view study groups as also effective to their academic success goal. Moreover, the existing perception of the effectiveness of group study to achieving academic success (i.e., good grades) also predicted the dependent measure ($F(1, 88) = 11.85, p = .001$). This simply shows that people tended to be largely consistent – if they thought group

study was effective to getting good grades prior to the study, they tended to still think it was effective for academic success at the end of the study. This result also supports the idea that people's judgments are constrained by their prior beliefs/attitudes.

Independent variables and their interaction: After the above two measures were covaried out, there was a significant interaction between the two independent variables, $F(1, 88) = 4.69, p < .05$. Relative goal magnitude did not have an overall main effect on the dependent measure ($F(1, 88) = 1.68, p = .20$), while stimulus ambiguity did, $F(1, 88) = 10.63, p < .005$.

The contrast between the two goal conditions under low ambiguity (only negative information) was significant, $t(85) = 2.22, p < .05$, showing that although people for whom the importance of the academic goal was elevated responded to the highly constraining information (i.e., all negative arguments available) quite accurately, those for whom the social wellbeing goal was enhanced still demonstrated significant biases in favor of group-learning. The contrast between the two ambiguity conditions under the academic success goal was also significant, $t(85) = 3.50, p = .001$, indicating that without the presence of a biasing goal people's responses reflected the difference in the effectiveness of group-learning conveyed by the corresponding information in the two conditions.

The contrast in evaluation of group-learning between the two ambiguity conditions under the academic success goal also provides a check for the manipulation of this variable. Indeed, although group-learning was viewed quite positively ($M = 5.00, SD = .69$) when balanced arguments about its effectiveness

were given to the participants, it was rated much more negatively ($M = 3.76$, $SD = 1.70$) when only its disadvantages were presented.

The difference between ambiguity conditions under the social wellbeing goal was not statistically significant ($t(85) = 1.21$, $p = .23$), indicating that participants with the biasing goal enhanced were not constrained by the clearly negative information in the low ambiguity condition and, in spite of it, still largely favored group-learning as effective for achieving academic success.

Discussion

The significant interaction obtained in Study 4 indicates that when people focused on the judgment task per se they appeared to be more accurate and their responses largely reflected the inherent accuracy in the judgmental option (i.e., the effectiveness of group-learning) given the information available in the situation. Importantly, however, when people's social wellbeing goal was enhanced, they overcame the difficulty of distortion stemming from the constraining all-negative information about group-learning that was congruent with this biasing goal.

The effect of people's existing beliefs about the conduciveness of study groups to making friends on their judgment of its effectiveness in achieving academic success supports the assumption that people would favor group-learning in the current judgment task because it was believed to serve the biasing goal. Moreover, unsurprisingly, people's final judgments on the effectiveness of group-learning were largely consistent with their prior beliefs on the same issue assessed in the beginning of the experiment. This finding reflects the effect of "constraints" imposed by

people's prior knowledge/attitudes on motivated biases, in line with Kunda's reasoning (1990).

Interestingly, the average existing academic success goal and social wellbeing goal assessed in the questionnaire prior to any experimental manipulations did not predict people's final judgment. Together with the predicting power of the two covariates, this suggests that it was not just what chronic goals the participants subscribed to that affected their judgments; rather what seemed to matter was which goal was situationally dominant and also whether participants believed that the specific means was conducive to that goal.

In summary, results from Study 4 provide support for the hypothesis that clear-cut (rather than ambiguous) information makes distortion difficult, however, this difficulty can be overcome when the relative magnitude of the biasing goal is high enough.

Though the overall pattern of Study 4 results is consistent with my analysis, there is one seeming exception to this assessment: I had expected a difference between the two goal-enhancement conditions (greater distortion under enhancement of the social wellbeing goal versus no enhancement) when the information provided on group-learning was balanced and distortion difficulty was low. However, in fact, participants in the social wellbeing goal condition did not seem to favor group-learning more than those with the academic success goal enhanced. One possible explanation for this result is that since the dependent measure question was framed in terms of achieving academic success, which was made highly desirable in the context of the study, people in both goal conditions tended to focus on the positive aspects of

group-learning when balanced information was available. This is similar to the finding by Kunda (1987) that when academic achievement was made desirable participants recalled more of their academic successes than failures, and came up with self-serving theories about how their unique personality characteristics may contribute to academic attainments. Also, Kunda and Sanitioso (1989) found that when certain personality traits were presented as conducive to academic success people reported possessing more of those traits than did the control participants. In this sense, even the people with academic goal enhanced in Study 4 may have been “biased” and thus had an easier time distorting the information when positive arguments about group-learning were readily available (Higgins, 1996). However, when only negative arguments were present such distortion was difficult. Therefore, their low evaluation of group-learning reflected ‘reality’. On the other hand, even when only negative arguments about group-learning were provided, participants in the social wellbeing goal condition had a strong enough motivation to favor group-learning and overcome the ‘reality constraints’. Another possibility is that participants from both goal enhancement conditions under stimulus ambiguity rated group-learning equally positively, probably due to a ceiling effect so that increasing magnitude of the biasing goal did not matter.

To investigate the foregoing possibilities, Study 5 manipulated the relative magnitude of a biasing health goal to general life concerns that are presumably neutral to the judgment task of tea tasting used in that study. Therefore, the high ambiguity condition in Study 5 should demonstrate greater distortion under enhanced

biasing health goal compared to the neutral goal condition, when the situation is ambiguous.

Study 5 was also carried out in order to further explore the role of distortion difficulty induced by unambiguous stimuli and the overriding effect (i.e., overriding highly constraining information) of a relatively strong biasing goal. To afford generalization of the results across instances, a different paradigm and an alternative way of operationalizing the two independent variables were adopted. Specifically, Study 5 manipulated stimulus ambiguity in the same manner as in classic ‘unconscious choice’ studies (e.g., Nisbett & Wilson, 1977; Kruglanski et al., 2005, Study 1 - 4; Kim et al., 2007), either using similar/same quality products to make the situation ambiguous or having one product clearly superior to the alternatives rendering stronger constraints to biases. In Nisbett and Wilson’s (1977) studies, passersby asked to choose among four different nightgowns of a similar quality or among four identical pairs of nylon stockings at a department store heavily overchose the two rightmost objects in the array. Presumably participants in these studies possessed a biasing goal to make a quick decision and the two rightmost objects in the array served this goal. This explanation was tested and supported by a series of studies conducted by Kruglanski and his colleagues (2005, Study 1).

The Tea Tasting Paradigm

Study 5 also adopted the “tea tasting” paradigm originally used by Kim and Mitchell (2007) in which the quality of two types of iced teas and the magnitude of health concerns was altered in order to give rise to a biasing goal in a taste judgment task. In their study, a health concern goal was primed via a scrambled sentence task in

the experimental condition while this goal was absent in the control condition. Participants were asked to choose the better tasting of two iced teas, one of which was diluted by water such that it contained only 95% of the original content. The two drinks were labeled differently with the diluted one implicitly promising 'health.' Kim et al. found that a significantly larger percentage of participants in the health goal prime condition chose the diluted drink compared to those in the control condition. Although data from a pilot study showed that the original tea was accurately chosen as better tasting by another sample of participants and the two labels were not perceived differently in their attractiveness, the participants in the actual study who judged the diluted drink to be better tasting justified their choice in terms of the taste of the tea.

Although distortion was found, the tea difference created in Kim et al.'s study was quite minimal. There was a 60% ($N = 50$) choice of the non-diluted tea in their pilot blind taste test but this difference was not significant. Therefore, the results from their study do not provide compelling evidence to support the idea that strong biasing goal could overcome the 'focal override' effect found by Kruglanski et al. (2005, Study 3). To make the reality constraints great enough to demonstrate that strong motivation could overcome distortion difficulty even in extreme circumstances, Study 5 aimed to create a significant difference in the subjective taste between the two teas in an unambiguous (high constraining) condition while keeping a no-difference (ambiguous) condition as a control to replicate the results from classic 'unconscious choice' research. In addition, actual choice rather than an attitude question, used by

Kim and Mitchell (2007) served as the dependent measure in Study 5 as described below.

Section 2

Study 5

Overview. Study 5 went beyond Kim et al.'s study by adding and varying the parameter of stimulus ambiguity. Specifically, in Study 5, stimulus ambiguity was manipulated as a two-level factor, such that in one condition ambiguity was high, with no dilution for the 'nutrition essential' tea making the two options virtually the same, while in the other condition ambiguity was low, with the diluted 'nutrition essential' tea containing only 80% of the original tea. Orthogonal to the ambiguity manipulation, relative goal magnitude was manipulated by enhancing either health concerns or concepts neutral to the judgment. Specifically, to increase the relative magnitude of the biasing health goal, a 'health' version of a 'Life Style Profile' (Walker et al., 1987) was used, with only items relevant to health in the original profile included. As examples of items in the profile participants were asked to indicate how often they engaged in activities such as 'Checking cholesterol level', and 'attending health care programs'. I assumed that reading and thinking about such activities would serve to situationally enhance participants' health concerns. In the control condition, participants were given a general version of the 'Life Style Profile' (Walker et al., 1987) with the original items relevant to health taken off. Examples of this profile include items inquiring into frequency of engagement in 'Enthusiastic/Optimistic', and 'Recreational activities'. I assumed that these items would not systematically alter the participants' health concern in any way.

Overall, study 5 employed a 2 (high vs. low health goal as the biasing goal) X 2 (high vs. low stimulus ambiguity) factorial design. It was expected that in the control condition, participants would be sensitive to the actual taste difference (or lack thereof) between the two iced teas. Thus, I expected that participants would choose the original tea as better tasting than the diluted tea or choose the two teas equally in the absence of dilution. In contrast, I expected that when a health concern was enhanced, participants would favor the ‘nutrition essential’ tea as the tastier tea. Most importantly, I expected that participants with an enhanced health goal would overcome the ‘reality constraints’ imposed by the 20% dilution (for the nutrition essential tea) and still exhibit bias towards the nutrition essential tea.

Method

Participants

One hundred and seventy-nine University of Maryland students (83 women, 96 men) were actively approached and recruited on UMD campus through a ‘tea tasting’ task. A free snack was given to each participant at the end of the task. Participants’ gender did not yield any significant effect hence it will be omitted from subsequent discussions.

Procedure

The study was advertised as ‘Tea Tasting and Free Snack’. Experimenters approached potential participants on campus and explained the task procedure. Upon providing oral consent, participants first filled out a ‘Life Style Profile’. Then they were given two samples of iced teas to taste and asked to judge which tea tasted better. The free snack was offered as a reward for completing the task.

The iced tea used in the current study was made out of Lipton Iced Tea powder. As in Kim et al.'s study (2007), one tea was labeled 'everyday life smooth' whereas the other was labeled 'nutrition essential.' In addition, two levels of stimulus ambiguity were created through either 0% (i.e., no) dilution or 20% dilution for the 'nutrition essential' tea, keeping the original quality for the 'everyday smooth' tea (based on the water- tea powder ratio suggested on the product package). When there was no dilution for the 'nutrition essential' tea the two teas were actually of the same quality and taste and differed only in their attached label, therefore, the stimulus ambiguity in terms of their taste was extremely high. On the other hand, when the 'nutrition essential' tea was diluted by 20%, the taste information was rather clear and ambiguity was low. The dependent measure was the participants' choice of the better tasting tea. Reasons for their choice were also recorded as was done in the Kim and Mitchell (2007) study. Upon completing the task, every participant was offered a choice from among a variety of snacks and drinks, including healthy ones such as water and fruit & nut bars, as well as unhealthy ones such as chocolate bars and Coke. Their choice of either a healthy or unhealthy snack/drink was recorded for analysis as well. Given the naturalistic setting of the study, debriefing every participant was not practical. However, anyone who inquired about the nature of the study was fully debriefed.

Since people's tastes for iced teas vary, to find out whether statistically-speaking there was an actual preference for the non-diluted tea over the diluted tea among University of Maryland students on campus, a pilot study on tea taste was carried out with an independent sample of 40 UMD students recruited on campus.

These students tasted samples of the original tea and the 20% diluted tea with no labels and made a judgment as to which tea was tastier.

Results

Manipulation check: Chi-square test with an independent sample of 40 students on the perceived taste difference between the original tea and the 20% diluted tea revealed a significant taste preference for the original tea over the diluted tea. Specifically, 27 (or 67.5%) of the 40 pilot study participants chose the original tea as tastier, $\chi^2 (1, N = 40) = 4.90, p < .05$.

Tea taste preference: A logistic regression was carried out to examine the effect of relative goal magnitude and stimulus ambiguity on choice as the dependent variable. There was a main effect of relative goal magnitude, $\beta = 1.41, p < .005$, indicating that there was significant over-choosing of ‘nutrition essential’ tea when the background health goal was enhanced. The main effect of stimulus ambiguity was also approaching significance with two-tailed test, $\beta = .77, p = .086$.

As shown in Figure 5, when the health goal was not enhanced, that is, when the general version of ‘Life Style Profile’ was given, participants’ choices reflected the actual taste difference in the two teas. Specifically, when there was no dilution to the ‘nutrition essential’ tea participants under no health goal enhancement actually chose either tea to the same extent (50% of participants chose either tea), $\chi^2 (1, N = 46) = .00, p = 1.00$. Moreover, when the ‘nutrition essential’ tea was diluted by 20%, 68.29% of participants under no health goal enhancement actually chose the original ‘everyday smooth’ tea as tastier, $\chi^2 (1, N = 41) = 5.49, p < .05$. This result also matches the pilot study data.

Figure 5. The effect of relative goal magnitude and stimulus ambiguity on tea taste preference

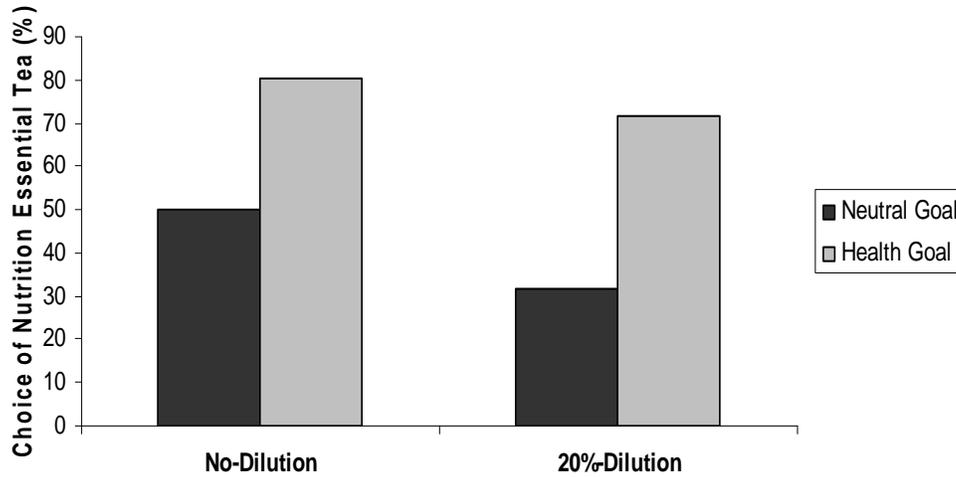


Figure 5 shows that when background health goal was enhanced, 80.43% of participants in the no-dilution condition ($\chi^2 (1, N = 46) = 17.04, p < .001$) and 71.74% of participants in the 20% dilution condition ($\chi^2 (1, N = 46) = 8.70, p < .005$) chose the ‘nutrition essential’ tea.

Simple effect of health goal enhancement was significant for both dilution ($\beta = 1.70, p < .001$) and no-dilution ($\beta = 1.41, p < .005$) conditions. Although there was no preference for either tea under no-dilution when participants were given the general version of “Life Style Profile” to complete, those who received the health version of the profile demonstrated a clear preference for the nutrition essential tea. Even under the dilution condition where justifying choosing the diluted tea was more difficult (reflected by the normal preference pattern in the neutral goal condition as well as the pilot test result) participants with enhanced health concerns still preferred the diluted nutrition essential tea. The choice pattern was reversed when the health goal was enhanced compared to the neutral goal condition.

The simple effect of tea dilution under neutral condition was approaching significance with two-tailed test ($\beta = .77, p = .086$), suggesting that participants were sensitive to the actual taste difference/no-difference between the teas. Tea dilution did not seem to exert any impact on the choices when the health goal was enhanced as in both dilution and non-dilution conditions the diluted nutrition essential tea was greatly preferred to the original everyday smooth tea.

The interaction between the two independent variables was not statistically significant.

As found in Kim et al.'s study, the reasons participants provided for their choice of either tea were framed in terms of taste. People choosing the original tea said the tea was 'sweeter', 'smoother', had a 'stronger taste' and so on, and those who chose the diluted tea told us that it tasted 'lighter', 'less sweet', had a 'better texture', etc.

Discussion

Results from Study 5 are consistent with my expectations regarding the roles of relative goal magnitude and stimulus ambiguity in motivated biases. Specifically, although participants under neutral goal enhancement were sensitive to the actual taste difference (or lack thereof) between the two tea options, those with health goal enhanced seemed to have been able to overcome whatever constraints were imposed by such 'reality'. There was a significant bias in choice favoring the 'nutrition essential' tea when the two teas were virtually the same (i.e., no dilution condition). More interestingly, with the health goal enhanced, even when the 'nutrition essential' tea was diluted by 20% it was still significantly overchosen compared to the

‘everyday smooth’ tea, representing a complete reversal of the findings in the neutral goal condition.

Study 5 created a subjective taste difference that was statistically significant, as demonstrated by the Chi-square statistic from the pilot test with an independent sample of participants and the 20%-dilution/neutral goal condition in the actual study, as well as the contrast between dilution conditions under neutral goal. These results suggest that the 20% diluted tea was indeed viewed as less tasty than the non-diluted tea, and therefore it would be more difficult to justify choosing the diluted nutrition essential tea as the tastier tea, compared to the situation where the two teas were essentially the same. Nonetheless, significant biases in choice still occurred under such highly constraining circumstances. As mentioned earlier, the taste difference created in the original tea tasting study by Kim and her colleagues was quite minimal, with a non-significant taste preference statistic in a blind pilot test. Findings in Study 5 are thus more conclusive in demonstrating the overriding power of a strong biasing goal to overcome the extreme constraints of an unambiguous situation.

The non-dilution (high ambiguity) condition in Study 5 did show a significant difference in preference as a function of relative goal magnitude which Study 4 failed to demonstrate. As discussed earlier, under the high ambiguity condition in Study 4 people with the biasing social wellbeing goal did not evaluate group-learning more favorably than did those with the academic success goal, presumably because people with the enhanced academic success goal were also biased in their judgments by focusing on the positive arguments about group-learning. Therefore Study 5

complements the findings in Study 4 by illustrating the basic effect of goal magnitude on distortion under ambiguous situations.

In addition, rather than using a Likert scale type attitude measure for judgmental biases as in Studies 1-4, Study 5 utilized a choice paradigm similar to all ‘unconscious choice’ studies and directly showed the biases in choice among judgmental options. The benefit of this paradigm, besides providing a behavioral alternative to the attitude measure, is that biases are exhibited in a more straightforward fashion, and since there is a specific judgment that is clearly accurate (e.g., choice of the non-diluted tea) it can serve as a reference point for demonstrating the existence and magnitude of the motivational bias.

Chapter 4: Title of Chapter 4

The first aim of the present series of studies was to test the hypothesis that motivated biases are resource dependent and therefore scarcity of cognitive resources should result in less distortion. Three studies employed the same judgment task wherein undergraduate UMD students were asked to judge how much UMD versus Duke was deserving of an award, with the objective information provided on both school's relative track and field performance highly ambiguous. These three studies also adopted the same subliminal priming technique to prime either a basing goal to identify with one's own university (UMD) or an accuracy goal. However, these studies also differed in important ways.

Study 1 varied the presentational format of the track and field performance information with either an easy-to-process tabular format or a complex narrative format shown to be more difficult to process. Results from Study 1 demonstrate that participants biased their judgments toward favoring UMD when they were primed to identify with their own university and the information was easy to process. However, when the information was difficult to process this bias disappeared.

In order to conceptually replicate the findings from Study 1, and also rule out the alternative explanation that the results were dependent on the specific formats of information, Study 2 kept the same tabular form across conditions while cognitive resources were manipulated via a prior cognitive task (i.e., the Stroop task) that was either easy (low resource depletion condition) or difficult (high resource depletion condition). As in Study 1, participants who were presented with a UMD identification prime again exhibited ingroup favoritism by overvaluing the performance of UMD team, but only when their resources were relatively intact (after engaging in an easy version of the Stroop task) as opposed to depleted (after engaging in a difficult version of the Stroop task).

Study 3 retained the same narrative form of the information across all conditions and measured Working Memory Capacity as a proxy for individual differences in cognitive resources (rather than situationally manipulating this variable as was done in Studies 1 and 2). Results illustrate that participants with higher WMC formed more biased judgments compared to those with lower WMC when they were motivated to favor their own university. Besides conceptually replicating the findings from Study 2, Study 3 also helped to rule out the shared alternative explanation for both of the preceding studies (and for that matter, any procedure relying on situational manipulation of cognitive resources) regarding the possibility that the situational manipulation in-and-of itself changed the participants' biasing or accuracy motivation in any particular way. Studies 1, 2, and 3 therefore provide convergent evidence supporting the idea that cognitive resources matter in motivated biases.

The second hypothesis the current research sought to test was that distortion difficulty resulting from unambiguous or clear information in a judgment task can be overcome by a biasing motivation with a sufficiently strong magnitude. Studies 4 and 5 were thus carried out to examine the roles of relative goal magnitude and stimulus ambiguity in motivated biases. The two studies each used judgment scenarios and goals presumed to be relevant to college students' everyday life and goals, and examined biases in judgment through either a measure of attitude (Study 4) or an actual choice behavior (Study 5).

Specifically, Study 4 manipulated relative goal magnitude through enhancement of either an academic success goal (in line with the judgment task) or a social wellbeing goal (the biasing goal) via an open-ended question focusing on either goal. At the same time, it orthogonally varied the stimulus ambiguity parameter by presenting participants with either balanced information or only negative arguments on the effectiveness of group-learning for achieving good academic performance. Consistent with my analysis, Study 4 found that when group-learning (congruent with the biasing goal) was presented as clearly ineffective (representing a low ambiguity and high constraints condition), even though participants' judgment reflected such low effectiveness in their attitude measure in the academic goal condition, those with the biasing (i.e., social wellbeing) goal enhanced overcame the 'reality constraints' and still rated group-learning as rather positive.

Unexpectedly, Study 4 did not find a difference in judgment between the two goal conditions *under high stimulus ambiguity*, in other words, the dependent measure did not differ as a function of the relative goal magnitude manipulation, To

address this problem, as well as conceptually replicate the findings from Study 4 regarding the overriding role of strong biasing goal under high reality constraints, Study 5 was conducted, which pitted a biasing health goal against neutral concerns in a tea tasting judgment task. Cross-cutting the parameter of relative goal magnitude, Study 5 also manipulated the variable of stimulus ambiguity via the creation of actual quality difference between two iced teas. The two teas were labeled differently, with one neutral (“everyday smooth”) and the other promising healthful benefits (“nutrition essential”). A 20% diluted version of the original tea was found to reduce the subjective taste preference significantly in a pilot study and was therefore used for the low ambiguity (i.e., high clarity) manipulation wherein the “nutrition essential” tea was the less tasty of the two teas.

When not diluted (high ambiguity condition) the “nutrition essential” tea was overchosen among participants with enhanced health concerns while participants with neutral concerns chose the two teas at a 50-50 ratio. More importantly, under high clarity (i.e., the 20% dilution condition), although participants with neutral concerns were sensitive to the actual quality difference between the two teas and selected the original quality “everyday smooth” tea as the tastier tea, participants with health concerns enhanced still overchose the “nutrition essential” tea despite the dilution. The reasons given by the participants were invariably in terms of “taste”, in line with the explicit judgment task of choosing the better tasting tea. Overall, then Study 5 provides support for the overriding effect of a strong biasing goal on motivated biases by demonstrating that even though clear/unambiguous information makes distortion

less likely under ‘normal’ circumstances, such ‘reality constraints’ can be overcome when the magnitude of the biasing motivation is high enough.

Over the past few decades, several independent lines of research in social psychology have provided conclusive evidence for the existence of motivated biases in judgment. Once the phenomenon of motivational effects on judgment was established, the next generation question was to delineate its *boundary conditions* (Zanna and Fazio, 1982). A major such boundary condition concerned the “reality constraints” exercised by the informational environment confronting the individual (Kunda, 1990). According to this notion, people are not at liberty to conclude whatever they want to; rather, people attempt to be rational and to construct a justification of their desired conclusion that would persuade themselves as well as dispassionate observers. Thus the extent of distortion is constrained by one’s ability to construct such justifications. Clarity of the information afforded to the perceiver defines such a constraint. The clearer the information, the more difficult it may be to deny, reframe, or suppress it despite one’s motivation.

Based on Freud’s concept of defense mechanisms (1920) and Kunda’s notion of possible mediating processes in motivated bases (1990), several possible *underlying mechanisms* may enable distortion. These include: (a) suppression/inhibition of undesirable or motivation inconsistent information, (b) denial of obvious “reality” features, and (c) generation of counter-arguments to undesirable information involving a possibly laborious memory recollection or an effortful construction of new, motivationally desirable counterarguments. Hence, if such mechanisms of distortion do exist, and if their utilization may involve a certain

degree of difficulty, the effectuation of distortion should require overcoming the difficulty involved, for which one would need sufficient cognitive and/or motivational resources.

As noted earlier, distortion can be also made difficult if one's cognitive resources have been drained through processing the information per se (e.g., if the information is long and complex, if the concepts are novel to a lay person and require certain level of expertise), or via concurrent cognitively demanding tasks (e.g., background noise, multiple tasks). Resources can become scarce from completion of prior fatiguing tasks or certain individuals (e.g., those with relatively low working memory capacities) may not have much cognitive resources to begin with. Under these conditions one will have few cognitive resources left (i.e., residual resources) for distorting the information after processing it. This also suggest that if one has sufficient amount of *residual resources* after processing information these resources could be utilized for greater distortion leading to more biased judgment.

Much has been said regarding the influence motivational and cognitive factors can exert on the extent and direction of information processing and judgment. High processing motivation and high cognitive resources have been shown to generally *increase* the amount of *relative objective* information processing (e.g., processing both arguments and heuristics rather than only heuristics, and assigning weight to different pieces of information in a relatively objective manner rather than a biased manner) and therefore increase the quality of judgment when the dominant motivation is neutral (e.g., need for cognition, need for accuracy). But the present studies aimed to show that under circumstances where a biasing motivation is present

and of sufficient magnitude, the presence of motivational and cognitive resources can increase judgmental bias in a motivationally congruent direction.

Results from my first three studies are consistent with the prediction that distortion decreases when individuals' cognitive resources are drained from processing complex and lengthy information (Study 1), or from a prior cognitively demanding task (Study 2), or if one has a chronically low cognitive capacity (Study 3), controlling for the relative magnitude of the biasing goal. Holding the cognitive resources parameter constant, Studies 4 and 5 investigated the possibility that a sufficiently strong biasing motivation can overcome distortion difficulty in highly constraining situations (i.e., high information clarity). Data from these two studies support the hypothesis. High information clarity (low ambiguity) was shown to significantly reduce the extent of distortion when a biasing goal was of relatively low magnitude. However, when the biasing motivation was relatively dominant it successfully overcame the barrier to distortion created by such reality constraints.

The findings from Studies 1-5 are an encouraging first step en route to understanding the parameters and dynamics of the fundamental processes involved in motivated biases. Yet a great deal of further work is necessary in order to obtain all of my objectives. While the first three studies focused on cognitive resources in the process of motivated distortion, Studies 4 and 5 more systematically investigated the role of relative goal magnitude in the phenomenon when stimulus ambiguity in the situation is quite low and, therefore, constraints for distortion are rather high. Although evidence exists demonstrating the effect of stimulus ambiguity (or "reality constraints", "elasticity") on distortion, this very concept could define the broader

construct of distortion difficulty that can be also affected by other considerations as well. All together, Studies 1-5 show that distortion difficulty (from different sources) can be overcome given a sufficient amount of cognitive (attentional) resources, and motivational resources.

One other important moderator of motivated biases is the *perceived conduciveness or instrumentality of a judgment to the biasing goal*. Other factors being constant, the more conducive a judgment is perceived to be to a biasing goal, the greater the distortion in terms of the tendency to perceive this particular judgment as accurate. Suggestive evidence in support of this implication is provided by the unconscious choice studies (Nisbett & Wilson, 1977; Kruglanski et al., 2005, Study 1-4), wherein the choice items were of equal quality (and therefore were equally as accurate to the judgment of choosing the best quality item), yet specific choices were made because of their conduciveness to specific biasing goals. At the same time, the reasons the participants gave for their choices were invariably phrased in terms of the quality of the items, a framing in line with the judgment goal. In my current series of studies, Study 4, in particular, provides more direct evidence for this moderating effect, as group-learning was viewed as more effective in achieving academic success when it was perceived as conducive to a biasing social wellbeing goal (i.e., making friends), with other factors controlled for.

Results from Study 4 and 5 suggest that where the inherent accuracy of a judgment (e.g., low ratings of group-learning or the choice of the original quality 'everyday smooth' iced tea) is distinctly higher than that of other judgments (the low stimulus ambiguity condition) while its conduciveness to a biasing goal (e.g., social

wellbeing or health concerns) is distinctly lower than that of other judgments, the choice between judgments should be determined by the relative magnitude of the implicit judgmental accuracy goal and the biasing goal such that the goal with higher magnitude overrides that with lower magnitude. That is, if the dominant goal is to make an accurate judgment then ‘focal override’ should occur but when the biasing goal is of a much higher magnitude it could ‘override’ the ‘focal override’ effect.

It is now time to revisit the notion that *distortion is resource dependent*.

Though the idea that mental resources (e.g. attentional resources) can enhance motivational biases is novel and seemingly at odds with the general notion that the presence of resources increases judgmental objectivity and accuracy, this is not meant to suggest that resources produce distortions under all circumstances. Rather, it would be incumbent on future research to identify the moderating conditions under which resources introduce bias versus enhancing accuracy. One possibility is that resources are employed in the service of the dominant motivation. If so, where the accuracy motivation was of a higher magnitude than the biasing motivation, resources would decrease bias. However, where the biasing motivation was of greater magnitude than the accuracy motivation (presumably the case in the present studies), the presence of resources would enhance bias. These possibilities could be fruitfully investigated in subsequent research.

The phenomena of motivated bias are ubiquitous in human affairs. Sometimes bias in judgment can be functional and beneficial. In this vein, Taylor and Brown have argued that positive illusions are adaptive as they increase motivation and persistence (Taylor & Brown, 1988), whereas in other circumstances bias it can be

counterproductive and possibly dangerous (Weinstein, 2004). Imagine, for instance, a patient distorting or denying his/her problematic health situation such as playing down the seriousness of early symptoms of a severe disease. Such person may avoid or refuse to undergo the necessary medical procedures, hence allowing his or her condition to deteriorate.

Alternatively, individuals who distort an abusive relationship and judge it as normal might end up as long-term victims. Thus, fully understanding the underlying mechanisms of motivated bias is quite important in a variety of cases, and rich in its implications for ways of coping with life's adversities. Particularly, understanding the moderating roles of factors such as cognitive resources and relative magnitude of biasing motivation could have implications for purposefully enabling/disabling or enhancing/reducing distortion when these seem beneficial to the individuals concerned. The present research constituted a first step toward gaining such understanding.

Appendices

Appendix A

Ethical Dilemmas

Often find ourselves faced with all kinds of ethical dilemmas such as these listed below.

There are good reasons for people to react to these dilemmas in a lot of different ways.

Please write down, on the blank page provided to you, how you would react if you were in these situations and explain in as much detail as possible why you would react this way.

Dilemma 1:

You are the TA of a class. A student after receiving a B+ from the class comes to you and shows you her transcript. This is her last class in college and she is currently applying for graduate school. Her GPA without the grade from this class just passes the requirement of the graduate program she wants to get in but the grade from this class is going to make her GPA drop below the minimum requirement. She begs you to move her grade to A- but you think this wouldn't be fair to other students in the class... what would you decide to do?

Dilemma 2:

You're jogging on the street one day. You happened to see some high school girls teasing and bullying another girl. It's getting pretty bad and it seems like it'll probably get physical. Are you going to intervene or ignore them and pass by?

Dilemma 3 (*Your own dilemma*):

Please recall some ethical dilemma you have experience in your own life? Please describe what happened and how you dealt with it.

Appendix B

For college students, all kinds of study groups could be a good way to build meaningful and long lasting social networks that prove to be beneficial to both their personal lives and careers. The forms of study groups include those where classmates get together for homework or class projects at school, and they can also be the virtual study groups that students do over the internet using IM or facebook, etc. In these study groups, students engage in deeper and problem solving oriented communications compared to usually superficial tasks in other forms of college socializations. Also group studies often involve much more sophisticated socialization skills such as sharing information, finding out and utilizing each other's unique angle and expertise, negotiation and collaboration, in order to work together efficiently to complete a complex task. Furthermore, in such occasions students are more motivated to work and socialize with other students that are not necessary similar to them, as in the case of other forms of socializations. By interacting with people different from them, either personality or knowledge, or general background, or even culture wise, they develop a broader view and deeper understanding of social groups and have the opportunity to build beneficial social skills that would help them interact and cooperate with people different from them at work place after they graduate from college.

Appendix C

(Balanced Information)

Research on group dynamics has shown that group-learning can have both advantages and disadvantages for individual performance.

Below are some commonly found pros and cons of group learning. Can you think of an instance, based on YOUR PERSONAL EXPERIENCE, for each of them?

In order for us to better understand these behaviors involved in group-learning, please write down one instance for each of these pros/cons in as much detail as possible.

1. Students come to a more complete understanding by comparing with others.

2. Pressure to conform (to agree with the majority) suppresses new ideas.

3. Having to explain to others encourages elaboration.

4. Some group members can freeload and few others have to do extra work.

(All negative information)

Research on group dynamics has shown that, group-learning tends to be more detrimental than beneficial to individual performance.

Below are some commonly found disadvantages of group-learning. Can you think of an instance, based on YOUR PERSONAL EXPERIENCE, for each of them?

In order for us to better understand these behaviors involved in group-learning, please write down one instance for each of these items in as much detail as possible.

1. Pressure to conform (to agree with the majority) suppresses new ideas.

2. Some group members can freeload and few others have to do extra work.

3. The time spent talking about irrelevant topics is unbelievable.

4. Sometimes people just don't get along.

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