The Impact of Information Processing Goals and Capacity Restrictions on Attitude-Memory

by

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Abstract

Researchers have long presumed that attitudes play a role in information processing, affecting memory in an attitude-consistent manner. This is known as congeniality. This presumption was largely dismissed as a result of a large scale, comprehensive meta-analysis (Eagly et al., 1999). The current project proposed that the conditions under which congeniality was tested in the past were not conducive for eliciting these effects. The present research tests cognitive capacity restrictions and salient information processing goals as moderators of the effects of attitude on memory in a 3 (Information Processing Goal: Attitude Expressive vs. Alternative Perspective Taking vs. No Goal) X 2 (Time Restriction: Restricted vs. Unrestricted) X 3 (Issue: Eating Red Meat vs. Marijuana Use vs. Playing Contact Sports) design. Participants were given a specific processing goal and were presented with issue-relevant information at either a restricted or unrestricted time interval. After a delay, they were presented with recall and recognition tasks. Results indicated that goals moderated the effects of attitudes on the favorability of correct recall such that memory tended to be biased in the same direction as the goal. Experiment 2 expanded this research by including a second session 48 hours later which served as a second testing phase for memory. Again, during the first session, information processing goals were found to moderate the effects of attitude on the favorability of correct recall. Interestingly, the second session failed to find these effects, but instead found weak evidence of global congeniality regardless of goal condition. The implications of these findings are discussed.
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Chapter 1: Introduction

I had, during many years, followed a golden rule, namely that whenever a published fact, or new observation or thought came across me which was opposed to my general results, to make a memorandum of it without fail and at once; for I had found by experience that such facts and thoughts were far more apt to escape from the memory than the favourable ones.

-Darwin as quoted by Freud, 1938, p. 104

As is evident through Darwin’s statement, it has long presumed that attitudes play a role in information processing, affecting memory in an attitude consistent way. This means that if someone has an attitude towards an object, he or she will be more likely to process and remember information that is consistent with that attitude relative to remembering the information that is inconsistent with that attitude. This tendency to recall more pro-attitudinal information relative to counter-attitudinal information is known as the congeniality effect.

The notion of congeniality is based on more than Darwin’s experiences and Freudian thought, however. Social psychological research has explored congeniality effects in depth, embracing this phenomenon. One of the first theorists to address congeniality was Frederic Bartlett (1932). Bartlett was dissatisfied with Ebbinghaus’ approach to memory. Bartlett criticized Ebbinghaus for trying to isolate memory in terms of strictly cognitive processes, suggesting instead that memory is a subjective process by which individuals seek to abstract meaning relevant to that particular individual from
presented material; individuals are motivated by their needs to gather information that provides them with meaning and structure.

The case for congeniality was furthered by Gordon Allport (1935) who made assumption of attitude-memory effects evident in his definition of attitudes and in the assertions that he put forward, as seen in the *Handbook of Social Psychology*. By 1948, the notion of congeniality effects was so pervasive that Hammond went so far as to define attitudes in light of congeniality; “a source of energy or an affective state, capable of producing error in perception and recall” (p. 38). Thus, from an early stage, the notion of biasing was central to attitude research.

**Early Evidence for Congeniality**

Within 10 years of initial congeniality theorizing, researchers were attempting to empirically demonstrate congeniality effects in the lab (Alper & Korchin, 1952; Garber, 1955; Jones & Aneshansel, 1956; Jones & Kholer, 1958; Postman & Murphy, 1943; Seeleman, 1940; Zillig, 1928). One of the first empirical tests of this phenomenon came from Watson and Hartmann (1939) who explored attitude-memory effects from a Gestalt approach, suggesting that individuals need a frame from which to organize incoming information during processing and that memory can be an indicator to the presence and nature of these frames. In order to explore this issue further, the researchers chose an attitudinal object that was well known to individuals and which demanded attitude polarity to a large degree at the time: “Belief in a Personal God.” Participants were those who had extreme views on this subject at either end of the continuum. The procedure first consisted of a Thurstone attitude measure followed a free recall session where participants could list as many arguments for or against God as they could come up with. Next, participants were presented with twenty arguments regarding belief in God where
participants indicated whether they felt supported or attacked by the argument and rated the importance of the argument and then ranked the arguments. Another survey was given before participants were given unlimited time to recall as accurately and as detailed as possible the information that they had read and ranked previously. Participants then were allowed to go back and indicate whether their attitudes toward the topic had changed, although almost none were modified. Although the results were not statistically significant overall, the researchers found that those with theistic attitudes were more likely to recall the theistic information while those with the atheistic attitudes were more likely to recall atheistic information, thus providing some initial support for the idea of congeniality.

One of the best known demonstrations of the congeniality effect comes from Levine and Murphy (1943). Again, the researchers were concerned with attitudes in light of frame of reference suggesting that these frames can lead us to process certain information. Specifically, the researchers were interested in learning and forgetting curves when participants were placed under conditions of attitude bias: do learning curves under attitudinal bias look different than learning curves developed when one is faced with conflicting bias? They looked at the recall abilities of communists and anti-communists when presented with pro-communist and anti-communist information. Participants were presented with both an anti-communist passage and a pro-communist passage. Sessions were private for all participants and they were told to read the passages twice each at a normal reading rate. There was a 15 minute time delay between the reading of the passage and recall during which time the experimenter chatted with the participant about non-relevant issues. The subject was then asked to “Reproduce as accurately as possible the paragraph that was presented to you.” After a few minutes, the
same recall procedure was conducted with the second passage. This procedure was carried out on a weekly basis for four weeks and was known as the “learning phase.” For the following five weeks, participants were asked to recall information from the passages but were not presented with the information prior to the recall task.

Overall, it was found that the communists tended to recall more pro-communist information relative to anti-communist information and that the anti-communists tended to recall more anti-communist information relative to the pro-communist. Levine and Murphy attributed their congeniality finding to learning and forgetting curves: during the learning process, individuals tended to recall more attitude-consistent information but not yet at a statistically significant level. During the “forgetting period,” the differences in recalled information became significant so that more attitude-consistent information was recalled. They suggested that this may be due to selective forgetting. Interestingly, this study not only showed support for congeniality effects, but also showed evidence that attitude-consistent information was learned faster than attitude-inconsistent information, adding fuel to the attitude-memory fire.

**Early Theorizing on Congeniality Effects**

Motivated by encouraging findings of congeniality, researchers advanced formal theories and explanations for why these effects were occurring. One of these theories suggested that attitude-memory effects were likely to occur when there was a threat to the ego as a method of ego-defence (Wallen, 1942). Specifically, if information was presented that was counter to an individual’s attitude of themselves they would have altered recall of that information so that it matched more closely with their initial attitude.

The most notable theory during these early years was proposed by Festinger (1957) who suggested the theory of cognitive dissonance. Cognitive dissonance proposes
that individuals are motivated to reduce unpleasant cognitive states that arise from holding incompatible, conflicting cognitions, attitudes or opinions. This theory states that in order to reduce the tension between these conflicting cognitions, one must either modify existing cognitions so that they are compatible, or come up with new cognitions to garner support for one side. Congeniality effects are accounted for by this theory as individuals would seek out attitude-consistent information in order to maintain consistency of their attitude and avoid processing information that was counter to their attitude. Alternatively, individuals may process both attitude consistent and inconsistent information, but might spend more time and resources processing the attitude-consistent information as opposed to the attitude-inconsistent. Another possibility is that individuals selectively recall information that is consistent with their attitude so as to again feel secure in their attitude, lessening the draw of the competing cognition. A third strategy that may be used is the interpretation of information in an attitude-consistent manner. All of these strategies would tend to result in pro-attitudinal memory bias.

Failures to Replicate Early Findings

Despite encouraging early theorizing and findings, scepticism began to arise as researchers were unable to consistently replicate congeniality effects as described in earlier research (Brigham & Cook, 1969; Fitzgerald & Ausubel, 1963; Greenwald & Sakumura, 1967; Malpass, 1969; Pratkanis, 1984; Smith & Jamieson, 1972; Waly & Cook, 1966). Doubt initially crept in when Fitzgerald and Ausubel (1963) questioned how congeniality effects arose. In order to explore this issue, Illinois high school students were presented with a passage detailing a Southern interpretation of the Civil War which they were later tested on. The researchers found that when participants had equal knowledge of the subject, no congeniality effect emerged. They concluded that
knowledge, not attitude, was the fundamental factor driving any bias effects, thus challenging past research.

A study often cited for challenging congeniality effects was conducted by Waly and Cook (1966). In this study, participants learned 12 statements regarding segregation. After the learning phase, participants were asked to repeat out loud as many statements as they could remember. The study was a replication of Jones and Kholer (1958) which showed strong evidence for congeniality. Waly and Cook were surprised to find that their results showed no convincing evidence of a congeniality effect. Waly and Cook carried out an additional two studies. Again, contrary to expectation, the researchers failed to find conclusive support for congeniality effects.

Exploring Contradictory Findings

At the time, a variety of explanations were put forward to account for the stark difference between early congeniality research findings and these later findings. Waly and Cook (1966) considered that prior familiarity with statements, agreement with the statements and detection of the purpose of the study would affect research findings. However, they found little evidence that these factors influenced the results of their studies.

Concerns regarding congeniality were echoed by Greenwald and Sakumura (1967) who argued that prior subject selection was inherently biased. Specifically, they argued that individuals would have better memory for information they were familiar with. Thus, individuals who were selected based on involvement with an issue could confound results as any recall bias may not be due to attitude per se, but due to differential familiarity with the information on one side of the issue. For example, recalling Levine and Murphy (1943), it seems reasonable that communists were more
familiar with pro-communist information than anti-communist information, while anti-communists would have been more familiar with anti-communist information. As a result, it may have been that communists were recalling more pro-communist information because they knew that material best. Surprisingly however, they failed to find a relationship between familiarity and recall, but did discover that the novelty of presented information increased recall.

Another possible explanation for contradictory congeniality findings was that the results of the earlier studies were due to Type I error (Greenwald, 1975). It may be that failing to publish null findings provided pretense for congeniality effects as researchers who failed to replicate the effect may have assumed that their failure to replicate was due to their flawed methods. Greenwald noted that later studies which failed to replicate congeniality findings tended to carefully control for extraneous variables and employ more than one hypothesis test per publication. As a result of the improved research methods, it was unlikely that these later findings were due to Type II error. However, it is curious as to why there would be a shift towards reporting null findings. In fact, it is still rare to see null findings published which refutes this argument.

More recently, Judd and Kulik (1980) suggested that the emergence of congeniality effects were dependent on pre-existing associative networks in memory as well as whether the attitude being accessed is unipolar or bi-polar in nature. New information would be more easily encoded if there was already an associative network in memory and thus it would be more easily retrieved. Additionally, if an attitude was bi-polar, for example an attitude on a controversial topic, it would be less likely for a congeniality effect to emerge as information supporting both sides of the issue would be processed. The authors also noted that information that is highly attitude-consistent or
highly attitude-inconsistent is more likely to be recalled later. Thus, only in situations where an individual had experience with an issue, had an attitude that was unipolar and had been presented information that was highly attitude-consistent would a strong congeniality effect emerge. In concordance with their hypotheses regarding bi-polar attitudes, Judd and Kulik found higher and faster recall for information that was judged as extremely concordant or discordant with attitudes versus information that was not judged as being extreme. However, uni-polar attitudes were not empirically addressed.

Message length is another variable within attitude-memory research which could result in contradictory findings. Sheppard (1982) found that earlier studies tended to use longer information passages than the later studies which failed to find the result. As such, it was put forth that perhaps longer information passages are needed to elicit the attitude-memory bias, although it seems that this has yet to be empirically manipulated.

Yet another explanation for contradictory findings stems from the learning paradigm used within the experimental protocol. Researchers have found differences between incidental learning (unintentional or unplanned) and intentional learning (planned learning usually guided by some goal) (Fiske & Taylor, 1984; Malpass, 1969). One hypothesis suggested that if participants were forced to pay attention to all presented information (intentional learning), they would be more likely to process all of the information presented and thus there would be no need for attitudes to function as a heuristic for memory. Conversely, if an incidental learning approach was taken, there was a greater need for a heuristic to guide memory and perhaps attitude served this heuristic function. However, in Roberts’ 1985 meta-analysis, this effect did not appear.

Finally, some researchers offered no solution for the contradictory findings. A sense of exasperation was evident. For example, Brigham and Cook (1969) concluded
that if the attitude-memory relationship existed, it only existed under certain conditions which were not yet understood.

A Meta-Analytic Approach to Congeniality

By the mid 1980s, with the emergence of meta-analysis, researchers had a new way of finding the true nature of these mysterious effects. Meta-analysis provided the resources to first address whether or not congeniality effects were arising due to chance. Second, meta-analysis allowed researchers the ability to ascertain the conditions under which these effects occur.

The first of two major meta-analyses was conducted by Julian Roberts (1985) who reviewed 38 published reports addressing congeniality effects, concluded that overall there was a small to moderate effect size for congeniality ($d = .36$) such that individuals tended to recall more attitude-consistent information relative to attitude-inconsistent, although not to a large degree.

Interestingly, Roberts’ meta-analysis also revealed that delayed memory tests were more likely to show evidence of congeniality effects and that more recent studies were less likely to find the effect. To the surprise of some, Roberts failed to find evidence that incidental versus intentional learning conditions produce different results, there was no evidence of message length affecting bias, nor were there any significant differences in recall versus recognition types of memory tasks. Ultimately, Roberts concluded that although statistically there was evidence for congeniality effects, these effects were not as widespread as initially suggested.

Although Roberts provided meta-analytic insight into congeniality effects, Eagly, Chen, Chaiken, and Shaw-Barnes (1999) criticized Roberts for his incomplete sampling of studies, inclusion of studies with poor design, and his lack of attention to moderators.
In order to conclusively shed light on this issue, Eagly et al. conducted a large scale meta-analysis which is considered to be the most complete and definitive assessment of congeniality effects to date. This meta-analysis consisted of 70 experiments chosen based on very stringent criteria: studies clearly addressed the hypothesis of attitudes biasing memory; attitudes were systematically measured prior to experimental manipulation; the test of congeniality was empirically validated; and participants were experimentally exposed to both pro-attitudinal and counter-attitudinal information and this information was the same for all participants.

The researchers developed a comprehensive coding scheme to account for methodological flaws such as reliability and validity and as well addressed potential confounds such as confusing familiarity or expectancy with congeniality. Variables accounted for were the date of publication, type of publication (i.e., peer-reviewed journal article), the nature of the sample (i.e., a high school sample), and the nation from which the sample was taken from. Additionally, variables were developed to describe experimental design, independent variables used, characteristics of measures used, type of stimulus, general procedure (such as setting characteristics), whether raters were blind to condition and attitude score, memory indices, and characteristics of the attitudinal object.

In terms of overall study characteristics, Eagly et al (1999) found that most studies were published early in the 20th century and were conducted with a university sample. Most studies presented participants with information representing their own side of an issue and pitted it against the opposite side. In general, the measures of memory were given immediately following information presentation, although some included both immediate and delayed tests of memory. Although free recall was the modal measure of memory, others such as recognition were also seen. In most cases of free recall, coders
were not known to be blind to condition and the coding reliability was not made explicitly clear.

Overall, there was a mean weighted effect size of $d = .23$, indicating only a small effect of congeniality, notably smaller than Roberts’ ($d = .36$). When looking at individual studies, it was shown that 60% of studies had effect sizes that supported congeniality.

Consistent with its thorny past, attitude-memory again proved to be a complicated phenomenon. Although it seemed that there was overall support for congeniality, a variety of concerns arose over the robustness and meaning of these results, leading to questions as to whether these findings were spurious. To begin, it was found that in the pre-1960 studies where coders were not known to be blind to condition, the mean weighted effect sizes showed greater congeniality effects ($d_{i+} = 1.06$) than those conducted post-1960 ($d_{i+} = .12$), although there remained a small congeniality effect for the later studies. Just as non-blind raters created an inextricable confound, demand characteristics could also have resulted in spurious early findings. Researchers at the time were not explicitly made aware of issues such as experimenter expectancy effects and demand characteristics (Rosenthal & Rosnow, 1969) and thus, it was a concern that perhaps the findings could be a result of bias created during testing on behalf of the experimenter.

In terms of publication year, perhaps not surprisingly, it was found that as time progressed, the magnitude of effect sizes also decreased. When looking only at recognition data, again the strength of the effect declined with time. This has been attributed to the fact that early studies did not employ sensitivity measures which correct for bias. For example, early recognition data may have favoured congeniality by
rewarding yea-sayers. Guessing could also have been potentially rewarding for congeniality in past methods no methods for guess correction were employed.

Contrary to the Roberts’ meta-analysis, Eagly et al. found that congeniality effects were larger when the attitudinal object was high in value relevance. Another area of contention comes from the effects of timing: Roberts found that in general there were stronger congeniality effects when there was a delay between information presentation and the memory task. In the Eagly et al. analysis, this only held true for recognition data.

Although the mean weighted effect size ($d = .23$) suggested a small effect of congeniality, it is important to note that the overall median effect size was only $d = .10$, suggesting a large influence of outliers and wide variations of effect sizes between studies.

In conclusion, this meta-analysis found that congeniality effects declined as methodologically flawed data sets were removed from analysis, when studies employing recognition-sensitivity measures were used, and finally, it was found that the effects tended to decline over the years (hinting that research practices generally improved as the field progressed). When these factors were systematically accounted for, Eagly et al. (1999) showed that congeniality effects became trivially small$^1$.

Given the many compelling theories underlying congeniality, it may be somewhat surprising that Eagly et al. concluded that they do not functionally exist. However, there was a plausible explanation for these weak effects put forward by Eagly, Brannon, Shaw, and Huston-Comeaux (2000). The authors agree with past attitude-memory research as it

$^1$ As with any meta-analysis it was possible that non-significant findings failed to be included as a result of the file-drawer problem thus construing effects as more prominent than perhaps is accurate. Eagly et al. (1999) took steps to prevent this problem through the inclusion of dissertation research and the inclusion of many studies which refuted congeniality. Despite the possibility that unpublished null findings were not included in the meta-analysis, Eagly et al. (1999) still concluded that these effects do not exist and thus this was not a major concern.
regarded congeniality as a defence mechanism which protected and maintained an individual’s attitude. However, Eagly et al. (2000) felt that past research mistakenly focused on passive attitude defence mechanisms with respect to congeniality. Specifically, researchers in the past looked at how individuals processed information in such a way to either avoid attitude-consistent information or seek out attitude-consistent information, improperly processed attitude-inconsistent information, avoided attitude-inconsistent information in order to avoid unpleasantness, and failed to rehearse attitude-inconsistent information. Eagly et al. (2000) felt that individuals may not have been defending their attitudes passively, but instead were actively challenging counter-attitudinal information through counter-arguing. Counter-arguing is a process by which individuals defend and support their own attitude by processing and arguing against statements that are attitude-inconsistent.

The idea of counter-arguing was supported by findings that attitude-inconsistent information was scrutinized longer than attitude-consistent information and that attitude inconsistent information had higher recall rates than attitude-consistent information (Edwards & Smith, 1996). In addition, Ditto (1998) found that information that was inconsistent with preferences resulted in more processing than information that was consistent with one’s preference.

Interestingly, Eagly et al. (2000) found no support of congeniality. They did, however, find some support for counter-arguing as when individuals were faced with a controversial topic, congeniality effects did not emerge which suggested that perhaps counter-arguing, an active defensive processing method, could have taken place. Further supporting the counter-arguing hypothesis, they found similar rates of recall for pro-attitudinal and counter-attitudinal information, but in thought-listing tasks, participants
created more thoughts related to the counter-attitudinal information, suggesting greater processing of this information.

In accord with Judd and Kulik (1980), Eagly et al. (2000) suggested that a non-controversial topic would have been more likely to elicit a congeniality effect as opposed to a controversial topic. Eagly et al. (2000) argued that when faced with a non-controversial issue, individuals would be less motivated to counter-argue, thus facilitating congeniality, as opposed to the attitude being bipolar thus facilitating processing of both pro and counter-attitudinal information. However, non-controversial topics were not specifically addressed in this particular series of studies.

It might be expected that if counter-arguing were a strong method of attitude-defence which promoted processing of this anti-congenial information (as suggested by the previous research), that an anti-congeniality memory bias should result; however, there was no evidence for this. Perhaps although the anti-congenial information was processed to a higher degree, the passive approach was just as effective at eliciting better memory for attitude-consistent information, and thus these two opposing biasing effects offset one another, resulting in what appeared as no bias.

Overview of Current Theoretical Perspective

Based on a large scale meta-analysis, it has been proposed that there is little empirical evidence supporting congeniality effects. Based on this, one could conclude that congeniality effects do not exist to any large degree. Alternatively, one could consider the possibility that perhaps the conditions under which congeniality effects were tested were not ideal for the emergence of this bias. The contention of this thesis is that congeniality effects are more likely to occur under certain conditions than others.
All things being equal, it is assumed that individuals want to be accurate information processors. As such, they generally want to process information thoroughly and objectively so that they can arrive at accurate and rational decisions. This strategy, however, can be offset by certain conditions. For example, in some cases, individuals do not have the ability to process information thoroughly. Individuals are regularly confronted by such hindrances as time pressures (e.g., Sonbonmatsu & Fazio, 1990), demands for attention (e.g. Petty, Wells, & Brock, 1976) and individual differences in knowledge (Woods, Rhodes, & Biek, 1995) which can result in the inability to thoroughly and objectively process information (e.g. Chaiken, 1980; Fazio, 1990; Petty & Cacioppo, 1981, 1986). Under such ability restrictions, individuals must adopt another strategy for processing information, as it is not possible for them to thoroughly process the given information.

Even when individuals have the ability to objectively and thoroughly process information, they do not always have the motivation to do so. Individuals sometimes have motivational influences that determine the extent to which they process information. For example, an individual who is high in need for cognition (i.e., the extent to which someone enjoys processing information) may be more motivated to thoroughly process information as opposed to someone who is low in need for cognition (Cacioppo, Petty, Kao, & Rodriguez, 1986). Personal involvement with an issue can also act as a motivator. If an issue is very personally relevant for an individual, they are likely more motivated to devote more time and resources to processing that information as compared to someone who is not involved with the issue (Petty, Cacioppo, & Goldman, 1981). Although there may be many potential motivators for an individual in any given situation, consistent in all cases is that motivations can guide processing. As a result of
motivations, individuals must choose how to allocate their resources when processing and, as such, processing may vary in magnitude.

The basic contention of this thesis is that congeniality effects will emerge when individuals face capacity restrictions as a result of either lack of ability and/or motivation. When it is not possible to process information thoroughly, there is a need to be selective in the information that is processed. There are many types of selection strategies that could be adopted. For example, individuals might randomly select information to process. Alternatively, they might process based on the order that information is presented (e.g., only process the first few pieces of information). Although these approaches are certainly possible, many other strategies that might be used would tend to facilitate congeniality. For example, Judd and Kulik (1980) suggested that individuals tend to process information that already has an existing network in memory because it is easier and thus more efficient to do so. Following this, one might expect congeniality to emerge as attitudes already have an existing network in memory and thus it would be easy to process information that is consistent with this network. This assumes, however, that the pro-attitudinal network is better developed than the counter-attitudinal network.

Another possible strategy is to process that information that is most pleasant (Festinger, 1957). If an individual has an attitude toward a topic, it seems likely that it would be pleasing to process information that reinforces this attitude. Although it has been proposed that counter-arguing attitude-inconsistent information is one strategy used in selection (Eagly et al., 2000), it is unlikely that this is happening when an individual faces capacity restrictions. When one is restricted, the capacity to engage in this active defence is diminished. In light of these past hypotheses, it is possible to see how congruency strategies can aid information processing when the conditions allow.
Although capacity restrictions on their own might elicit congeniality effects, the influence of processing goals might accentuate this bias. Individuals do not approach information in a vacuum; they are influenced by salient goals. Some of these goals are best served by attitude-congruency. For example, a salient goal might be to express our views on a topic. When we express our views, we want to believe in what we are saying and we want to appear rational. In this case, an attitude-congruency approach to information processing would satisfy this attitude-expressive goal. A congruency approach is also useful in cognitive dissonance arousing situations. Here, an individual must explain the opinion to themselves so as to support a given attitude, allowing the individual to feel secure in that judgment. By recruiting attitude-consistent information, one is able to bolster the attitude thus reducing dissonance.

Of course, not all goals are satisfied by attitude-congruent processing. For example, if an individual is expected to show understanding of an opinion that is opposite to his or her own, an alternative perspective taking goal, perhaps that individual would be best served by an anti-congruency bias. That is, the individual might tend to process and remember information that is counter to his or her attitude. Alternatively, when an attitude is threatened, an individual might process all presented information in order to counter-argue attitude-inconsistent information so as to defend the attitude in question. As noted, counter-arguing is an active defence method (Eagly et al., 2000) and as such, it is unlikely that this method of attitude defence is taking place when an individual faces capacity restriction.

Following this logic, congeniality effects are expected to be especially strong when capacity restrictions are present and when salient processing goals are best served by an attitude-congruent strategy. When there are no capacity restrictions and/or when
processing goals are not best satisfied by attitude-congruent processing, congeniality effects are expected to be less likely to emerge.

Evaluating Past Research in Light of Current Theory

It is useful to consider past research in light of the current theory. Eagly et al.’s (1999) meta-analysis provided a number of valuable insights into understanding congeniality effects; however, as it relied on past research for analysis, it failed to capture the conditions under which congeniality effects would be most likely if the current speculations are correct. Indeed, when considering the studies reviewed in this thesis, it is clear that most studies did not restrict capacity and accuracy goals were made salient, creating conditions under which congeniality effects were unlikely to occur. In terms of ability, 83% of the studies reviewed ensured that participants had substantial time and opportunity to process the presented information, eliminating the need for a heuristic to guide processing. For example, Brigham and Cook (1969) had multiple learning sessions where participants read all presented information. Watson and Hartmann (1939) not only had participants read all presented information, but also rank the information in terms of effectiveness.

With respect to motivation, 50% of studies reviewed explicitly used the guise of a learning or memory task as the presented purpose of the research and in fact, approximately 42% explicitly warned of an upcoming memory task. For example, Eagly et al. (2000) told participants that their research was “concerned with the processing of verbal information” while Waly and Cook (1966) provided one of many examples of participants being warned of an upcoming memory task prior to the participant being exposed to the information that they would be tested on. Cases such as these most likely would have led to high motivation to process information thoroughly. Furthering this, in
75% of studies, participants were in fact told to recall as accurately or as much of the information as possible. For example, Alper and Korchin (1952) told participants that their purpose was to standardize a memory task and told participants to recall verbatim the information they had recently seen. Although instructions such as these would likely have increased capacity, it is also likely that these instructions implied the goal of objectivity which would have reduced the chances of congeniality emerging.

In light of the current theoretical perspective, most studies created conditions that were hostile to congeniality effects and as such these effects were unlikely to emerge. Thus, it is not surprising that congeniality effects were often not found, but rather what is more surprising is that they were found at all.

Overview and Goals of the Current Research

The main goal of the current research was to test speculations about when congeniality effects occur. Specifically, this research examined the role of capacity restrictions and information processing goals as determinants of congeniality. Experiment 1 tested the idea of capacity restrictions and goals across three health related issues. To examine the impact of capacity restrictions, time pressure was manipulated so that half of the participants were under time pressure so that a selectivity strategy was needed in order to process the information. The other half of the participants faced no such time pressure. Also manipulated was the information processing goal that participants received. One third of participants were presented with an attitude-expressive goal where they were asked to explain their own opinion. One third of participants were presented with an alternative-perspective taking goal where they were asked to explain why others might disagree with their perspective. One third of participants acted as a control condition and received no information processing goal.
Experiment 2 was designed to accomplish a variety of goals. First, Experiment 2 acted as a replication of Experiment 1. Also in this study, the capacity manipulation was strengthened by imposing time pressure at two phases of information processing, rather than one. Finally, Experiment 2 was designed to assess the long term effects of congeniality.
Chapter 2: Experiment 1

Method

Design

This experiment was a 3 (Goal at Exposure/Retrieval: Pro-attitudinal goal vs. Counter-attitudinal goal vs. No goal) x 2 (Exposure Duration: Time restricted vs. Time unrestricted) x 3 (Issue: Marijuana use vs. Eating red meat vs. Playing contact sports) design.

Participants

Participants were 42 male and 143 female Queen’s University introductory Psychology undergraduate students (N = 185) participating for extra course credit or cash compensation. The average age of participants was 18.31 years.

Procedure

Phase 1: Introduction to the experiment and attitude measurement. Participants were brought into a computer lab in groups of one to six. Participants were first asked to read the letter of information and sign the consent form (for all documents related to Experiment 1 ethics, see Appendix A). Participants had the opportunity to ask any questions prior to the session beginning. Once consent was obtained, participants were told that the researchers were interested in opinions toward a variety of topics. As such, participants were told that they would be presented with information on a topic and then asked about their opinions towards their topic.

At this point in the study, participants were asked to initially report their attitudes regarding either marijuana use, the eating of red meat, or the playing of contact sports (For all materials and measures used in Experiment 1, see Appendix B). This stage allowed for the assessment of attitudes prior to any experimental manipulations.
Additionally, having participants report their attitudes prior to information exposure ensured that the related attitudes were highly accessible for all participants (see Fazio, 1995). Throughout the study, all materials were presented using “MediaLab” software (Jarvis, 2004).

**Phase 2: Exposure to Information.** In the second phase of the experiment, participants were randomly assigned to an issue condition (marijuana use, eating red meat, or playing contact sports). In both the marijuana and contact sports conditions, participants were presented with 6 pieces of pro-behaviour information and 6 pieces of anti-behaviour information. In the red meat condition, participants received 8 pieces of pro-red meat information, and 4 pieces of anti-red meat information. All information was presented via Medialab. However, prior to being exposed to any information, participants were also randomly assigned to a goal condition. Depending on the randomly assigned condition, participants were given either an attitude-expressive goal, an alternative perspective taking goal, or no goal. In the attitude-expressive goal condition, participants were told that there were several stages within the experiment. They were told that the last segment of the study involved them stating their opinions on video tape regarding the topic. Their video taped responses were to be shown to a group of their peers who shared similar attitudes. In order to enhance the goal manipulation, a video camera was placed at the entry way of the laboratory to reinforce that a video taped session would take place. Pre-testing showed this cover story to be effective. In all cases, there was no video taped session; this aspect of the procedure was a means of enhancing information processing goals.

In the alternative perspective taking goal, participants were also told that there were several stages in the experiment. In contrast to the attitude expressive goal
condition, these participants were told that they would state on video tape why people held opinions that were opposite to their own. This group was told that the video would be presented to those who disagreed with their attitude in order to show the participant’s ability to understand the opinions of others. As in the attitude expressive condition, a video camera was in the laboratory as a means of reinforcing this goal.

In the no goal condition, participants were given no explicit information processing goals. As there was no goal in this condition, no video camera was present.

The factor of exposure time was also manipulated during information exposure randomly across participants. All participants were presented with the same pieces of pro and con information within a given issue condition, either at a restricted time interval which challenged the participant’s capacity to process all of the information or at an unrestricted time interval which made it easy for participants to process all of the presented information. The information passages were presented one at a time. The computer presented the pieces of information in random order, advancing the screen at the time determined by the time restriction condition. Each passage had a heading at the top describing the content of the passage which was followed by approximately 5 lines of text detailing that particular argument. For those in the unrestricted time condition, the pieces of information were shown for 45 seconds as pilot testing determined 45 seconds to be more than any individual needed to read the individual information passages. Those in the restricted time condition were shown each information passage for 9 seconds. Pilot testing showed this was just less than the average amount of time needed for participants to read all of the information.

*Phase Three: Delay.* Once participants had been presented with the information, they completed filler tasks which lasted for approximately 20 minutes. It has been shown
that this time delay creates conditions more likely to elicit congeniality effects (Roberts, 1985). Participants either completed a series of personality measures or an unrelated study.

**Phase Four: Retrieval.** Once participants completed their filler task, they were told that in preparation for their video task, it had been found to be helpful for participants to collect their thoughts about the information that had previously been presented. Respective goals were reinforced and they were then asked to recall information presented to them previously. Each piece of information recalled was to be typed into a response box presented on the computer screen. Participants spent 20 minutes in this task.

Finally, participants completed a recognition task regarding the information to which they were exposed. This task asked participants to respond either “yes” or “no” as to whether the information being presented was presented to them earlier. Response latencies were also recorded.

**Phase Five: Post-Attitude Measure and Behavioural Intentions.** In the final testing phase of this experiment, participants were asked to again respond to an attitude measure addressing their particular topic. Additionally, for exploratory purposes, participants were asked to respond to questions assessing their past behaviours regarding their topic as well as their future behavioural intentions with respect to the topic. In conclusion, participants were asked to indicate their age and gender.

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2 Initially, participants completed a variety of individual difference measures: Need for Cognition Scale (Cacioppo, Petty, Kao, 1984), Self-Monitoring Scale (Gangestad & Snyder, 1985) and the Need to Evaluate scale (Jarvis & Petty, 1996). However, as time progressed, an unrelated study was substituted as the filler task. This study involved participants reading about a department store and then responding to questions about the department store. Scores from the individual difference measures were not used.
Phase Six: Debriefing. After completing these tasks, participants were debriefed and given handouts from a recognized government agency with respect to the topic. This was intended to provide current, accurate information for participants. For example, if the topic was the eating of red meat, the participant received Canada’s Food Guide to Healthy Eating (Health Canada, 2005).

Materials

In order to assess the relationship between attitude and memory, it was necessary to choose issues where there was variation within attitude scores. As such, issues were chosen that showed a wide distribution of attitudes. It was decided that topics would be chosen from the general domain of health as both pro and con arguments could be readily created for each topic. Based on pre-testing of many health topics, the three topics of marijuana use ($M = 3.44$, $SD = 1.35$), the playing of contact sports ($M = 4.46$, $SD = 1.73$), and the eating of red meat ($M = 4.07$, $SD = 1.82$) were chosen as they showed a wide variability of attitude responses on a 7-point scale. It was necessary to construct information that was both for and against each of the chosen topics. This information had to be comparable in both amount and extremity. As such, some of the information was fabricated; however, all information was constructed so as to be believable.

Measures

Attitudes toward topic. Participants were first asked to report their attitudes regarding their respective topics through an 8-item, 7-point scale (Crites, Fabrigar, & Petty, 1994). Four of the items presented adjectives were reflective of positive evaluations of the topic (e.g., positive, desirable) while the other four presented adjectives reflective of negative evaluations (e.g., bad, undesirable). The response range was labelled from 1 (not at all) to 7 (definitely). Negative items were reverse coded and all
responses were averaged to create an overall score for attitude where a score of one represented the greatest possible negative attitude towards the topic and a score of seven represented the greatest possible positive attitude towards the topic. Cronbach’s alpha demonstrated high internal consistency within the red meat issue (α = .93), marijuana issue (α = .95), and the contact sports issue (α = .85).

**Favourability of correctly recalled information.** During the recall task, participants were electronically (via MediaLab) asked to recall information that had been presented to them earlier regarding the target health behaviour. These responses were later coded as being for, against, or neutral towards the given health behaviour. The coding was conducted by two independent raters who were blind to condition.

The recall measure of interest was the favourability of correctly recalled information, the measure that is most commonly used when evaluating congeniality. This index determined the amount of pro-behaviour versus anti-behaviour information freely recalled. Thus, a proportion of total correct positive information recalled was created by subtracting the correct negative information recalled from the correct positive information recalled and then dividing by the total number of correct facts recalled (positive correct recall – negative correct recall / total correct recall). Accordingly, a value of -1 indicated all information recalled was anti-behaviour, whereas a value of 1 indicated that all information recalled was pro-behaviour. Inter-rater reliability for this index was high, $r = .93, p < .01$. Because these two independent indices were highly correlated, they were averaged together to create one favourability index$^3$.

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$^3$ Inter-rater reliability was conducted using Pearson correlations rather than Kappa. Kappa is used to index inter-rater agreement of the classification of each individual item recalled, whereas Pearson looks at the agreement of raters on the frequency of item categorization across categories. Because the level of analysis in this thesis was conducted at the aggregate category level, Pearson was chosen as the best method to index
**Misremembered recall.** Of course, when recalling information, individuals may make errors and as such, incorrectly recalled pieces of information were also coded. Two obvious types of errors are misremembering information that was presented (i.e., distorting a fact) or adding information that was not presented. In theory, these two errors could be analyzed separately, or be aggregated into one score representing errors in recall. Unfortunately, even in aggregated form, these errors occurred rarely and as such could not be meaningfully analyzed. For reference, this index was comprised of the total number of misremembered/added anti-behaviour pieces of information subtracted from the total number of misremembered/added pro-behaviour pieces of information. This value was then divided by the total number of misremembered/added recalled statements, creating a range of scores from -1 to 1 where a value of -1 indicated all misremembered information was anti-behaviour whereas a value of 1 indicated all misremembered information was pro-behaviour.

**Favourability of correct recognition.** After completing the recall task, participants were presented with 24 statements regarding their topic and were asked to respond “yes” or “no” as to whether the information was presented in a previous section. Half of the items had been previously seen. Of this half, there were an equal number of pro and anti-topic statements. The other half of the recognition items had not been seen. Again, half of these distracter items were pro-behaviour while the others were anti-behaviour. Response latencies were recorded.

The first index analysed was correct recognition. This index reflected both the correct acceptance of information as well as the rejection of false information. A

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inter-rater reliability. It is noteworthy that the presented analyses were carried out with each rater’s indices separately, revealing nearly identical results. Additionally, in the past we have found both Kappa and Pearson reliability estimates to give very similar results when using this type of open-ended coding.
proportion representing these correct judgments (total pro-behaviour correct recognition judgments – total negative-behaviour correct recognition judgments / total correct recognition judgments), was calculated. Scores ranged from -1 to 1 where a value of -1 indicated all anti-behaviour correct judgments while a value of 1 indicated all pro-behaviour correct judgments. It is important to note that while we expected the recognition data to show similar patterns of results to the recall data, it was not expected that any bias effects would be very strong. Inherently, recognition tasks are easier than recall tasks and with only a short time delay between exposure and retrieval, it was expected that accuracy rates would be quite high and thus bias would have a hard time manifesting itself.

*Favourability of incorrect recognition.* During the recognition task, participants could make two types of errors. The first error was when participants incorrectly indicated that they had had seen a piece of information before, thus committing a “false alarm.” The second error was to indicate that they had not seen information that they in fact had seen, known as a “miss.” An index was created to capture the extent to which errors were made that suggested support for pro-behaviour pieces of information versus anti-behaviour pieces of information. Thus, within this index, anti-behaviour errors subtracted were from pro-behaviour errors, divided by the total number of recognition errors (\{Pro-behaviour False Alarm + Anti-behaviour Miss\} - \{Anti-behaviour False Alarm + Pro-behaviour Miss\} / Total Recognition Errors). This created a range of scores from -1 to 1 where -1 represented all anti-behaviour errors and a score of 1 represented all pro-behaviour errors. Unfortunately, similar to the favourability of incorrect recall index, these errors occurred rarely and as such could not be meaningfully analyzed.
Post-Attitude measure. At the conclusion of the session, participants were asked to complete a post-attitude measure in order to determine if any change in attitude has taken place as a result of the information presented. The post-attitude measure differed slightly from the initial attitude measure as it presented participants with phrases that addressed to what degree the participant endorsed or opposed the target behaviour, whereas the initial attitude measure simply presented participants with one word at a time and asked how much each word described their evaluation of the behaviour. This scale was comprised of six items. Cronbach’s alpha demonstrated high internal consistency within the red meat issue (α = .93), marijuana issue (α = .88), and the contact sports issue (α = .90).

Behavioural measures. Participants were reminded of confidentiality and then were asked a series of behavioural questions. The first question asked whether or not the participant had engaged in the target health behaviour in the past (i.e., a yes/no format). Next, participants were asked to fill in how many times in the past week they had engaged in the target health behaviour. Finally, participants were asked on a 1-7 scale to indicate how likely they were to engage in the target health behaviour in the future. For all behavioural items, participants had the option to choose “prefer not to say.”

Demographics. Participants were finally asked in an open-ended format to indicate their age and then were asked forced choice to report their gender at the end of the study.

Results

The primary goal of this thesis was to determine how attitudes can influence memory, and to understand the role that processing goals and capacity restrictions play within this relationship. In this thesis, bias was indexed by the extent to which attitudes...
predicted what participants later remembered. As such, a positive coefficient suggested congeniality. That is, if a participant held a favourable attitude towards the given health behaviour, they remembered more favourable information regarding that health behaviour relative to unfavourable information. Of course, congeniality could also emerge if a participant held a negative attitude and recalled more unfavourable information relative to favourable. Alternatively, a negative coefficient suggested an anti-congeniality bias. That is, a participant who held positive attitudes toward the health behaviour would have tended to remember more unfavourable information relative to favourable. Again, an anti-congeniality bias would also emerge if a participant held a negative attitude toward the behaviour yet remembered more pro-behaviour information relative to anti-behaviour.

In all analyses, of critical importance was the effect of attitude on the favourability of memory. That is, did attitudes influence memory? Of course, the hypotheses of this theoretical perspective varied across the levels of the experimental conditions. As such, the interactions of attitudes with the other predictor variables captured the nature of these effects.

In order to test the hypothesis that attitudes influence memory, the extent to which indices representing the favourability of remembered information were attitude-consistent was examined in a series of regression analyses. Because attitudes were a continuous variable, they were thus centered to prevent multicollinearity among interaction terms and their constituent components (see Aiken & West, 1991). These regressions included the centered attitude toward the presented health behaviour, a dummy variable representing time restriction conditions, two dummy variables representing processing goal conditions.

\[^4\text{Centered attitudes were calculated within each issue. These values were then aggregated into one centered attitude variable that was used in all analyses. This was done so as not to confound attitude scores with issue.}\]
and two dummy variables representing the health behaviour conditions. The regression models included all main effects, all two-way, all three-way and the four way interaction of these variables as predictors. Although all predictors were tested within each model, within the context of this experiment, only those related to attitude were conceptually relevant. As such, only those effects involving attitude will be addressed (for a complete description of all effects, see Appendix C).

Favourability of Correct Recall.

The first dependent variable explored was the favourability of correct recall as it is the most commonly used measure of congeniality. It might be expected that a main effect of attitude influencing correct recall would emerge from this analysis; however this was not necessarily predicted as some conditions were expected to elicit congeniality while others were expected to elicit an anti-congruency bias. In fact, there was no significant main effect of attitude, $F(1, 180) = .37, p = .55$.

The first two-way interaction that was most theoretically relevant was the interaction between information processing goal and attitude. This interaction tested whether the impact of attitudes on the favourability of correct recall changed as a function of processing goals. It was predicted that in the attitude expressive goal conditions, participants would recall information that was consistent with their attitudes toward the behaviour. It was also expected that in the alternative perspective taking condition, participants would have better recall for information that was inconsistent with their attitude. No bias was necessarily expected in the no-goal conditions. Interestingly, there was some support for this hypothesis, although it was marginal, $F(2, 180) = 2.90, p = .06$.

Although this interaction must be interpreted with caution as it was only marginally significant, it was decomposed with a series of regression analyses to observe
general trends. This was done by conducting three regression analyses, examining the effects of attitude separately within each goal condition. For those who did not receive an information processing goal, there was no evidence of attitudes influencing the degree to which participants correctly recalled congenial versus anti-congenial information ($b = -0.002, SE = 0.03, p = .93$). Despite many findings which dispute the existence of congeniality effects, consistent with the hypotheses derived from this theoretical perspective, evidence of congeniality emerged. In the attitude expressive goal condition, participants recalled attitude consistent information to a greater degree than attitude-inconsistent ($b = 0.08, SE = 0.03, p = .01$). This pattern of results thus shows a congeniality effect for those in an attitude expressive goal condition. Further garnering support for the current theoretical perspective, in the alternative perspective taking condition, participants better recalled anti-congenial information ($b = -0.16, SE = 0.05, p = .001$). This finding suggests that attitudes can influence memory when information processing goals are served by such biases.

The next interaction involving attitude was a two-way interaction between time restriction and attitude, exploring whether attitude impacted this recall index differently depending on time restriction. It was not necessarily expected that this interaction would be significant as presumably the differing goal conditions within the two time conditions would offset each other. Consistent with this, the interaction was non-significant, $F(1, 180) = .10, p = .75$.

The third two-way interaction was between issue and attitude. This interaction explored whether the effect of attitude on the favourability of correctly called information differed across issue. There were no a priori hypotheses which expected effects to differ between issue conditions, and in fact the interaction was non-significant $F(2, 180) = 2.17$,
As there were no theoretical expectations with respect to this interaction, and given it was not significant, it was not investigated further.

Of the various three-way interactions within the model, the interaction among processing goal, time restriction and attitude was the most theoretically relevant. It was hypothesized that attitudes interact with goals and that time pressure might accentuate this relationship. Initial support for this hypothesis arose from the marginal interaction between goals and attitudes in the predicted directions. However, the three-way interaction was not significant $F(2, 180) = 1.25, p = .29$. Because clear predictions were made regarding this interaction, it was decomposed in order to observe general trends (see Table 1), although any findings must be interpreted with caution. This was done by conducting six regression analyses; one regression for each combination of goal and time restriction conditions. These regressions looked at the impact of attitudes on the favourability of correct recall.

Within this interaction, it was expected that in the attitude expressive goal condition, participants should demonstrate congeniality. It was also expected that in the alternative perspective taking condition, participants would demonstrate an anti-congeniality bias. These effects were expected to be more accentuated when participants faced time restriction. As can be seen in the first column of Table 1, when there was no time restriction, participants showed a congruency bias in the attitude expressive goal condition, showed weak anti-congruency bias when faced with no goal, and showed a strong anti-congruency bias when under an alternative perspective taking processing goal. Unfortunately, when looking at the second column of this table which represents those in the time restricted conditions, while the direction of the biases remained consistent, the magnitude did not strengthen, and if anything was weaker, although trivially so.
Table 1

*Unstandardized Regression Coefficients and Standard Errors of Favourability of Correctly Recalled Information When Split by Goal and Time Restriction*

<table>
<thead>
<tr>
<th>Goal</th>
<th>Time Unrestricted</th>
<th>Time Restricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attitude Expressive Goal</td>
<td>$b = .08, SE = .05$</td>
<td>$b = .08, SE = .04$</td>
</tr>
<tr>
<td>No Goal</td>
<td>$b = -.03, SE = .04$</td>
<td>$b = .03, SE = .03$</td>
</tr>
<tr>
<td>Alternative Perspective Taking Goal</td>
<td>$b = -.17, SE = .08$</td>
<td>$b = -.14, SE = .06$</td>
</tr>
</tbody>
</table>
The second three-way interaction involving attitude was among issue, information processing goal and attitude. This interaction tested whether goals were a more powerful moderator of congeniality within some issues than others. There was no theoretical reason to expect this interaction, and none was found, $F(4, 180) = 1.34, p = .26$.

Finally, there was a marginal three-way interaction among issue, time restriction and attitude, $F(2, 180) = 2.85, p = .06$. Although this was an unpredicted interaction, as it was marginally significant, it was decomposed in order to examine the general pattern of results (see Table 2). Looking at the table, within the Red Meat issue, the impact of attitudes on correct recall is identical regardless of time restriction. Within the issue of marijuana use, congeniality is found when time is restricted, whereas anti-congeniality is found when time is unrestricted. Interestingly, this effect reverses within the issue of contact sports. Here, congeniality is found when there is no time restriction, and anti-congeniality is found when time is restricted. There is no obvious reason to explain this pattern of results.

The final interaction examined was among attitudes, time restriction, information processing goal and issue. This interaction tested whether our predicted three-way interaction between attitude, processing goal and time restriction might be stronger within some of the issues. There were no theoretical reasons to expect a significant interaction, and no significant interaction was found, $F(4, 180) = .97, p = .43^5$.

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5 While Aiken and West (1991) suggested centering variables prior to running analyses so as to reduce multicollinearity among interaction terms and their constituent components, the traditional approach has been to conduct a hierarchical linear regression using raw attitude scores. This hierarchical analysis was therefore carried out for each dependent variable, producing similar patterns to those reported for those interactions of interest. Of particular interest was the interaction between goals and attitudes for the favourability of correct recall. When looking at this interaction based on a hierarchical analysis, it is significant, $F(2, 180) = 9.65, p < .01$. 
Table 2

Unstandardized Regression Coefficients and Standard Errors for Favourability of Correctly Recalled Information when Split by Issue and Time Restriction

<table>
<thead>
<tr>
<th>Issue</th>
<th>Time Unrestricted</th>
<th>Time Restricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating Red Meat</td>
<td>$b = -.08, SE = .05$</td>
<td>$b = -.08, SE = .05$</td>
</tr>
<tr>
<td>Marijuana Use</td>
<td>$b = -.10, SE = .05$</td>
<td>$b = .01, SE = .04$</td>
</tr>
<tr>
<td>Playing Contact Sports</td>
<td>$b = .07, SE = .07$</td>
<td>$b = -.08, SE = .08$</td>
</tr>
</tbody>
</table>
Favourability of Correct Recognition.

Some prudence should be exercised when interpreting the current recognition data. In this study, there was a relatively short delay between the exposure of participants to the information and the recognition task. Recognition is a relatively easy memory task as compared to recall. As such, with such a short delay, the recognition task may have been sufficiently easy, resulting in high accuracy, thus making it difficult for bias to manifest. Accordingly, although bias was expected in the same directions as with the recall data, the biases were expected to be weaker.

The recognition index reflected the proportion of the correct identification/rejection of pro-behaviour information versus anti-behaviour information. Consistent with the favourability of correct recall, there was no main effect of attitude, $F(1, 185) = .15, p = .70$. Again, it was thought that as opposing conditions were present, this main effect may fail to appear.

There were three, two-way interactions involving attitude. Just as in the previous index, the most theoretically relevant two-way interaction is that among information processing goal and attitude. This interaction was non-significant, $F(2, 185) = .16, p = .85$. The second two-way interaction involving attitude was that of time restriction and attitude. Parallel to the findings in the previous index, there was no significant interaction, $F(1, 185) = .50, p = .48$. The final two-way interaction was between issue and attitude. Again, there was no theoretical reason to expect that the effects of attitude on memory would differ by issue. Consistent with the favourability of correctly recalled information index, no significant interaction was found, $F(2, 185) = 1.15, p = .32$.

Additionally, there were three, three-way interactions involving attitude. Following the logic from the previous index, the three-way interaction between
information processing goal, time restriction, and attitude was the most theoretically relevant. Within this index, the interaction was not significant, nor was it marginal so as to warrant further inspection, $F(2, 185) = .46, p = .63$. The second three-way was between attitude, issue and processing goal. This interaction was non-significant $F(4, 185) = 1.42, p = .23$. As there was no theoretical reason to expect this interaction, it was not further explored.

The final three-way interaction regarding attitudes involved issue, time restriction and attitude. Although not expected, this interaction was significant, $F(2, 185) = 3.55, p = .03$. This interaction was deconstructed with a series of regression analyses. As can be seen in Table 3, those within the red meat issue condition showed an anti-congruency bias when faced with time restriction. Those not faced with time restriction demonstrated congeniality. In the marijuana condition, however, those who faced restriction and those who were unrestricted both equally showed anti-congruency biases. Trending in the opposite direction of the red meat condition, those who were exposed to contact sports information showed a congeniality bias when time restricted and an anti-bias when unrestricted. This pattern of results was not consistent with the pattern found in the same interaction when looking at the favourability of correct recall. There is no obvious interpretation for this pattern of results.

As expected, no evidence of a four-way interaction among attitude, information processing goal, time restriction and issue was found, $F(4, 185) = .29, p = .88$. 
Table 3

*Unstandardized Regression Coefficients and Standard Errors of Favourability of Correctly Recognized Information when Split by Issue and Time Restriction*

<table>
<thead>
<tr>
<th>Issue</th>
<th>Time Unrestricted</th>
<th>Time Restricted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating Red Meat</td>
<td>$b = .03, SE = .02$</td>
<td>$b = -.01, SE = .01$</td>
</tr>
<tr>
<td>Marijuana Use</td>
<td>$b = -.01, SE = .01$</td>
<td>$b = -.01, SE = .01$</td>
</tr>
<tr>
<td>Playing Contact Sports</td>
<td>$b = -.04, SE = .02$</td>
<td>$b = .002, SE = .02$</td>
</tr>
</tbody>
</table>
Discussion

Experiment 1 failed to provide evidence of attitude influencing memory within the recognition indices. As mentioned, this could be expected given the fact that the recognition task may have been sufficiently easy, resulting in high levels of accuracy on this task, making it difficult for bias to manifest. Of more interest within this study was the effect of attitude on the favourability of correct recall. Within this index, some patterns fit closely with the current predictions. Specifically, attitude expressive goals were likely to elicit a congruency bias whereas alternative perspective taking goals were likely to elicit anti-congruency biases. This is a notable finding as it has not before been demonstrated. Even more interesting, when looking within the attitude-expressive goal condition, the effect size for congeniality was much larger than that found by Eagly et al. (1999). Here, $d = .66$, suggesting a moderate effect of attitudes influencing memory bias.

Somewhat surprisingly, Experiment 1 failed to find an effect of time restriction accentuating memory bias for recall. There were two theoretically plausible explanations for this null finding. First, it may have been that time restriction was not effectively manipulated. This was tested to some extent by examining the overall amounts of correctly recalled pieces of information between those under restriction and those not under restriction. Surprisingly, those in the time restricted condition correctly recalled more pieces of information ($M = 11.06, SD = 4.95$) than those in the time unrestricted condition ($M = 9.55, SD = 4.75$), $t(186) = 2.12, p = .04$. Such an unanticipated finding suggested that the time manipulation did in fact cause group differences in recall; however, the differences are counter-intuitive.

Of course, it is possible that the time restrictions were strong enough per se to elicit group differences, but perhaps the effect was limited as it was only restricted at one
phase of information processing. When goals were manipulated in this study, they were reinforced just prior to exposure as well as just prior to retrieval. Time, however, was only restricted at exposure. It may have been that because time was only restricted at this one phase, it did not have the opportunity to exert its expected influence.

It should be noted that the failure to find effects of time restriction could be due to the fact that time restrictions do not restrict capacity as expected. Perhaps another cognitive capacity restriction would have provided the expected results.

One final caveat in this study is that all of the participants faced a 20 minute time delay between exposure and recall, which is a relatively short delay. In light of this, it makes sense that overall accuracy rates were high as the task was sufficiently easy so as to restrict the chance for bias to manifest. As recognition is an easier task, it was reasonable to see less evidence of bias than in the recall tasks. Supporting this, in some recall analyses, there was initial evidence for the current theoretical perspective; however, in indices representing incorrect recall and recognition, there were not enough incidents of error to meaningfully analyze those data. Perhaps with a longer time delay between exposure and retrieval (i.e., greater than 20 minutes), participants would make more errors, thus making such error indices more informative. Additionally, it seems reasonable to consider that if processing is initially biased at exposure, this bias might become stronger over time. These effects could be even more important within recognition indices of biased memory. As recognition is an easier task, greater time delay may reduce accuracy, thus providing an opportunity for bias to manifest itself.

Not only would the testing of these ideas with a greater time delay between exposure and retrieval provide potential theoretical backing for the current perspective, but it could also provide potential applied benefits. Although there would be few applied
benefits if bias was transitory, if these biasing effects carried over beyond the twenty
minute time delay, understanding the nature of these effects would become very useful.

Chapter 3: Experiment 2

Overview and Goals

Although Experiment 1 provided some initial support for the current theoretical
perspective, it also raised a number of issues that needed to be addressed. First, the
findings needed to be replicated. As such, Experiment 2 served as a first replication.
Next, there was no evidence of time restriction accentuating the impact of goals as
expected. This may have been due to a poor manipulation of this variable. As such,
Experiment 2 enhanced the time restriction conditions by not only restricting time during
exposure to the information, but by also limiting the time that participants had to recall
information. It was expected that by enhancing the time restriction, goal effects would be
accentuated as previously expected.

Experiment 2 expanded upon Experiment 1 by addressing long term effects of
attitude-memory. This study added an additional 30 minute session, held approximately
48 hours after the first session. During this session, participants completed a second
recall and recognition task. Here, they were not reminded of their goal. This session was
used to assess whether congruency biases increased over time. Specifically, although it
was expected that recall biases would increase as a result of this delay, it was also
expected that the recognition biases would become stronger as the task became more
difficult.

Finally, because Experiment 2 examined the long term implications associated
with attitude-memory, it made sense to address some behavioural implications of this
bias. This was done for exploratory purposes only. As such, participants reported
behavioural tendencies during the first session of this study, as well as the second. Additionally, during the second session, participants were given an opportunity to engage in behaviour-relevant actions that could be classified as attitude-consistent or inconsistent.

Method

Design

This experiment was a 3 (Goal at Exposure/Retrieval: Pro-attitudinal goal vs. Counter-attitudinal goal vs. No goal) x 2 (Exposure Duration: Time restricted vs. Time unrestricted) design.

Participants

Participants were 36 male and 79 female Queen’s University introductory Psychology undergraduate students (N = 115) participating for extra course credit or cash compensation in the first session of this study. The average age of these participants was 19.02 years. However, only 93 of these participants returned for the second session, and thus analyses for Session 2 were only conducted on these 93.

Procedure

Phase 1: Introduction to the experiment and attitude measurement. Just as in Experiment 1, participants were brought into a computer lab in groups of one to six. Participants were first asked to read the letter of information and sign the consent form (for all documents related to Experiment 2 ethics, see Appendix D). Participants had the opportunity to ask any questions prior to the session beginning. Once consent was

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6 There were no significant differences in terms of age, gender or attitudes towards the eating of red meat between those who attended Session 2 and those who failed to return. To be sure that those participants who failed to return were not driving Session 1 effects, the regression analyses for Session 1 were conducted with just those who also participated in Session 2. In terms of conclusions, there were no differences between the results reported and the results obtained with just those who attended Session 2.
obtained, participants were told that the researchers were interested in opinions regarding the eating of red meat. As such, participants were told that they would be presented with information on red meat and then asked about their opinions towards this topic.

Mimicking Experiment 1, participants were asked to initially report their attitudes regarding the eating of red meat (For all materials and measures used in Experiment 2, see Appendix E). Again, throughout this study, all materials were presented using “MediaLab” software (Jarvis, 2004).

Phase 2: Exposure to Information. In the second phase of the experiment, participants were randomly assigned to a goal condition. The same goal manipulations were used as in Experiment 1. The factor of exposure time was also manipulated during information presentation, just as in Experiment 1. All participants were presented with the same pieces of pro and con information regarding the eating of red meat. The duration and presentation of the information passages were the same as Experiment 1.

As no concerns over the issue presented arose from Experiment 1, this study only looked at the issue of red meat so as to limit excess variability resulting from multiple issues.

Phase Three: Delay. Once participants had been presented with the information, they completed an unrelated study which lasted for approximately twenty minutes.

Phase Four: Retrieval. Just as in Experiment 1, participants were asked to recall the information that they had been presented with. Participants in the unrestricted time condition spent 20 minutes in this task, while those in the restricted time condition were

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7 In the second study, all participants completed an unrelated judgmental extremity task where participants were asked to judge the colour of novel stimuli (in this case, Chinese characters). Additionally, participants were asked to remember the colour of the stimuli that they were presented with, and then rate their confidence in their memory.
only allowed 4 minutes to complete this task. Pretesting showed that most participants took approximately 6 minutes to complete the recall task. It was thought that if participants had ample time to recall information, the task might have been sufficiently easy so that bias did not manifest. As such, by restricting the time available at recall, it was thought that an attitude-memory bias might become apparent as participants would have been limited in their time to consider anti-congenial information. At the end of the allotted time, the computer progressed participants into the next phase of the study.

Following recall, participants completed a recognition task regarding the red meat information to which they were exposed. The same items were used as in Experiment 1. Response latencies were also recorded.

**Phase Five: Session 1 Post-Attitude Measure and Behavioural Measures.** In the final testing phase of this session, participants were asked to respond to the same post-attitude measure and behavioural measures as used in Experiment 1. No debriefing took place during Session 1.

**Phase Six: Session 2 Memory.** Two days after the first session, participants came back into the lab for a 30 minute follow-up. Participants were brought to the same computer that they had previously been tested at. They were asked to spend 10 minutes recalling what information they could from the previous session. Participants were not reminded of goal. At the end of 10 minutes, the computer progressed participants on to the next phase of the session.

Immediately following the recall task, participants completed the same recognition task as they had in Session 1.

**Phase Seven: Behavioural Intentions and Attitude Measurement.** Participants were told that as a service to the university, this study informed students about campus
activities related to red meat so as to help keep students informed. One at a time, they were presented with a variety of activities and events related to the eating of red meat. Participants were to indicate “yes” or “no” as to whether they would like to receive more information regarding each event. Half of these activities were pro-red meat (e.g., an evening seminar entitled “You don’t need red meat to be healthy”) while the other activities did not outwardly support the eating of red meat (e.g., volunteer to sign a petition against the removal of many red meat items from the cafeteria menu). Thus, participants had an opportunity to engage in attitude-relevant activity. Participants were also asked a series of behaviour-related questions including those asked in Session 1. Additionally, participants were asked to respond to a “yes or no” question asking whether the participant had eaten red meat in the last week, an open ended item asking participants how many times in the last 7 days they had eaten red meat, as well as a 1-7 scaled item asking participants how likely they are to include red meat in their future diet.

Participants were finally asked to indicate whether they were male or female, their age and to respond to the same post-attitude measure as was used at the end of Experiment 1 and Session 1.

**Phase Eight: Debriefing.** Participants were fully debriefed on both sessions of Experiment 2. They were additionally given a copy of Canada’s Food Guide to Healthy Eating (Health Canada, 2005) and had an opportunity to ask any questions related to the study.

**Materials**

The same information regarding the eating of red meat that was used in Experiment 1 was used in Experiment 2.

**Measures**
Attitudes toward Topic. Participants were asked to report their attitudes regarding the eating of red meat on the same index that was used at the beginning of Experiment 1. Cronbach’s alpha demonstrated high internal consistency at .94. Attitudes were also measured at the end of Session 2. There continued to be high internal consistency of this attitude measure as Cronbach’s alpha was .95.

Favourability of correctly recalled information. The coding for this index was conducted by two independent raters who were blind to condition for both Session 1 and Session 2 recall data. This index determined the amount of pro-red meat versus anti-red meat information correctly recalled and was calculated the same as in Experiment 1 ([(positive correct recall – negative correct recall) / total correct recall]). A score of -1 reflected all anti-red meat recall whereas a score of 1 represented all pro-red meat recall. Session 1 inter-rater reliability for this index was high ($r = .93, p < .01$). Because these two independent indices were highly correlated, they were averaged together to create one favourability index. Second session inter-rater reliability was moderate ($r = .70, p < .01$). The drop in reliability from Session 1 to Session 2 was presumably due to the lower frequency of correctly recalled pieces of information, thus restricting range. As a result of the two coders correlating moderately well, the indices were averaged to create an overall index.

Misremembered recall. This index was calculated as in Experiment 1 ([total number of misremembered/added pro- red meat pieces of information - total number of misremembered/added anti-red meat pieces of information] / total number of misremembered/added recalled statements). Again, the incidents of these two types of errors were low and were aggregated into one index. Unfortunately, as in Experiment 1,
the incidents of these errors in both Session 1 and 2 were low and thus were not able to be meaningfully analyzed.

**Favourability of correct recognition.** Participants were next asked to complete the same recognition task used in Experiment 1. Response latencies were recorded. The first index analyzed was the favourability of correct recognition ((total pro-behaviour correct recognition judgments – total negative-behaviour correct recognition judgments) / total correct recognition judgments). Scores ranged from -1 to 1 where a value of -1 indicated all anti-red meat correct recognition, while a value of 1 represented all pro-red meat recognition.

**Favourability of incorrect recognition.** False Alarms and Misses within the recognition task were again recorded. An index reflecting the favourability of incorrect recognition was created ([{Pro-behaviour False Alarm + Anti-behaviour Miss} - {Anti-behaviour False Alarm + Pro-behaviour Miss}] / Total Recognition Errors). This created a range of scores from -1 to 1 where -1 represented all anti-behaviour errors and a score of 1 represented all pro-behaviour errors. Unfortunately, just as in Experiment 1, there were not enough incidents of recognition error in either the first or the second sessions to make this a meaningful index to analyze.

**Post-Attitude measure.** As in Experiment 1, at the conclusion of the first session, participants were asked to complete a post-attitude measure in order to determine if any change in attitude has taken place as a result of the information presented. Cronbach’s alpha showed high internal consistency for this measure at .92.

**Behavioural Intentions.** After the recall and recognition tasks in Session 2, participants were presented with a variety of optional events and activities that were being held on campus that were related to the eating of red meat. Five of these events focused...
on the positive aspects of including red meat in one’s diet, while three tended to support red meat-free diets. Participants were presented with a one sentence description of each event one at a time on the screen. They were asked to indicate “yes” or “no” as to whether they wanted more information on the event. This was done for exploratory purposes and will not be further addressed.

In addition to behavioural intentions measured through the requesting of information, participants were also asked to respond to the same behavioural measures as presented in Experiment 1 for exploratory purposes.

Demographics. Participants were asked in an open-ended format to indicate their age and then were asked forced choice to report their gender at the end of the study.

Results

Just as in Experiment 1, a series of regressions were performed in order to understand these effects. These regressions included the centered attitude toward the eating of red meat, a dummy variable representing time restriction conditions, and two dummy variables representing processing goal conditions. The regression models included all main effects, all two-way and all three-way interactions of these variables as predictors. For the analyses addressing Session 1 bias, the centered attitude measured during Session 1 was used. For the second session analyses, the centered attitude as measured in the second session was used as a predictor. Although all predictors were tested within each model, within the context of this experiment, only those related to attitude are conceptually relevant. As such, only those effects involving attitude will be addressed (for a complete description of all effects, see Appendix F).

Session 1 Memory Effects
Favourability of Correct Recall. The first dependent variable explored was the favourability of correct recall. As expected and consistent with Experiment 1, there was no significant main effect of attitude, $F(1, 109) = 1.53, p = .22$.

Of critical importance was the significant two-way interaction between information processing goal and attitude. While this interaction was marginally significant in the first experiment, in Experiment 2, this interaction was significant, $F(2, 109) = 6.12, p < .01$. This interaction was decomposed with a series of regression analyses. Just as in Experiment 1, those who did not receive an information processing goal showed a slight tendency for an anti-congruency bias, however, this was non-significant ($b = -.05, SE = .03$). In the attitude expressive goal condition, participants recalled attitude consistent information to a greater degree than attitude-inconsistent ($b = .19, SE = .05$). Finally, in the alternative perspective taking condition, participants better recalled anti-congenial information ($b = -.05, SE = .06$), although this was non-significant. Thus, these results partially replicate the findings of Experiment 1 which suggested that attitudes can influence memory when information processing goals are served by such biases.

The second two-way interaction involving attitude was between time restriction and attitude. As there were opposing goal conditions within these restriction conditions, it was not necessarily expected that there would be a significant interaction. Consistent with Experiment 1, there was no significant interaction, $F(1, 109) = .02, p = .88$. There was a theoretically relevant three-way interaction between time restriction, information processing goal and attitude. This interaction tested whether time pressure would
accentuate the interactive effects of goal and attitude. As with Experiment 1, this interaction was not significant, $F(1, 109) = .63, p = .53^8$.

**Favourability of Correct Recognition.** As noted, recognition tasks are easier than recall tasks. As such, recognition biases were expected in the same directions as with the recall data, but the biases were expected to be weaker.

This recognition index reflected the proportion of the correct identification/rejection of pro-behaviour information versus anti-behaviour information. Consistent with past findings, there was no main effect of attitude, $F(1, 114) = .05, p = .82$. Again, it was thought that as opposing conditions were present, this main effect may fail to appear.

There were two, two-way interactions involving attitude. Just as in the previous index, the most theoretically relevant two-way interaction was that between information processing goal and attitude. Again, this interaction was non-significant, $F(2, 114) = 1.43, p = .24$. The second two-way interaction involving attitude was that of time restriction and attitude. Parallel to the findings in the previous study, there was no significant interaction, $F(1, 114) = .97, p = .33$. Additionally, there was one, three-way interaction involving attitude among information processing goal, time restriction, and attitude. Within this index, as in Experiment 1, the interaction was not significant, $F(2, 114) = .92, p = .40$.

**Session 2 Memory Effects**

**Favourability of Correct Recall.** Unlike past analyses, within the second session, there was a marginal effect of attitude, $F(1, 92) = 2.95, p = .09$. Although the direct

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$^8$ When a hierarchical linear regression was conducted, the two-way interaction of goals and attitudes with respect to the favourability of correct recall remained significant, $F(2, 109) = 7.40, p < .01$. 
effect of attitude on the favourability should be interpreted with caution as overall there was only a marginal effect, a regression looking at the direct impact of attitudes on the favourability of correct recalled suggested a slight tendency for congeniality ($b = .04, SE = .02$). The first two-way interaction involving attitude was between processing goal and attitude. Although this interaction previously had been found to be marginal or significant, in the second session, this effect was non-significant, $F(2, 92) = .10, p = .90$. The second two-way interaction involving attitude was between time restriction and attitude which, consistent with past findings, was non-significant, $F(1, 92) = .04, p = .84$. Finally, the three way interaction between processing goal, time restriction and attitude was also non-significant, $F(2, 92) = .75, p = .48$, as in past analyses.

Favourability of Correct Recognition. As there was a time delay of approximately 48 hours between the exposure to information and this recognition task, it was thought that bias may have had a chance to manifest itself, and thus, the patterns hypothesized by this theoretical perspective would be more likely to emerge. Unfortunately, this was not the case. Consistent with past analyses, there was no main effect of attitude, which was not surprising, $F(1, 92) = .12, p = .74$.

The first two-way interaction involving attitude was between information processing goal and attitude. As with past findings, there was no evidence that the impact of attitudes on the favourability of correct recognition changes as a function of information processing goals, $F(2, 92) = .05, p = .96$. The second two way involving attitude was between time restriction and attitude. Again, this interaction was non-

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9 Again, as the favourability of correct recall is the index most often cited within the literature, the interaction between goals and attitudes was tested hierarchically. Consistent with the reported results, there was no significant interaction, $F(2, 92) = .13, p = .88$
significant, $F(1, 92) = .49, p = .49$. Finally, consistent with Experiments 1 and Session 1, there was no significant three-way interaction among information processing goal, time restriction and attitude, $F(2, 92) = .37, p = .69$.

Discussion

Experiment 2 provided a partial replication of Experiment 1. Specifically, in Session 1 it was again found that information processing goals interacted with attitudes to produce a correct recall bias; those in the attitude expressive goal condition demonstrated congeniality, those with no information processing goal showed a non-significant anti-congeniality bias, and those in the alternative perspective taking condition tended to also demonstrate anti-congeniality. Unfortunately, the effect was not significant in the alternative perspective taking condition, as expected. These effects were only found for the favourability of correct recall index (the most commonly used index of memory bias), but not for the favourability of correct recognition. Interestingly, when looking at the effect size within the attitude-expressive goal conditions, we found a large effect for attitudes influencing the favorability of correct recall ($d = 1.29$). This is much larger than the effects reported by both Roberts (1985) and Eagly et al. (1999). The discussion will thus focus mainly on the recall index unless otherwise stated.

Although Experiment 2 had altered the manipulation of time restriction so that participants were restricted both during exposure and recall, it still failed to find an effect of this type of capacity restriction interacting with attitude and information processing goals. Perhaps again this manipulation failed to be effectively manipulated, or perhaps time restriction does not function as expected. This will be further explored in the General Discussion.
Again, contrary to expectations, there was no evidence of information processing goals acting as moderators in the second session of this study. There are several possible explanations for this. The first obvious explanation would be that a significant amount of memory decay took place within the 48 hour delay, and as such, participants forgot the material. For example, if participants tended to forget nearly all of the information, there should be no evidence of bias. This is possible, but unlikely for two reasons. First, in Session 2, participants surprisingly recalled approximately the same amounts of correct information ($M = 7.72, SD = 3.61$) as in Session 1 ($M = 8.23, SD = 4.44$). Correct recognition was also almost as good in Session 2 ($M = 17.33, SD = 3.10$) as in Session 1 ($M = 18.73, SD = 2.84$). In both cases, the difference in ability to remember correct information between sessions is small and thus memory decay was unlikely the cause of bias not appearing. Second, in the second session, participants do show bias in the favourability of correct recall, albeit not necessarily a goal consistent bias. The fact that participants overall showed congeniality biases refuted the possibility that participants did not remember the information, as they clearly did in a biased manner.

Another possibility for the lack of goals moderating memory bias may be due to lack of goal saliency. That is, perhaps since the goal was not made salient at retrieval during the second session, the effect was weakened. This will be discussed in depth in the General Discussion.

Interestingly, although there was no evidence of goals moderating bias in the second session, there was a moderate congeniality bias for participants regardless of goal condition in Session 2. Even those participants who were faced with an alternative perspective taking goal tended to recall more congenial information. It may be that there is a tendency to show congeniality at exposure but that this effect is hidden by goal
effects at retrieval. An important follow-up to address this issue would be to remind participants of their goal at Session 2 in order to see if the bias effects re-emerge.
Chapter 4: General Discussion

Summary of Findings

Despite the recent conclusions that congeniality effects do not exist (e.g., Eagly et al., 1999), the current research found evidence that they do emerge in the favourability of correct recall when the conditions allow. Specifically, there was evidence that information processing goals moderated congeniality effects. When these information processing goals were best served by congeniality, such as in an attitude expressive goal condition, congeniality effects emerged. When there was no information processing goal made explicit, there was no bias. When information processing goals were best served by anti-congeniality biases, such as in an alternative perspective taking goal condition, anti-congruency biases tended to emerge, although evidence for this anti-congruency effect was inconclusive as it failed to significantly replicate.

Contrary to theoretical expectations, there was no evidence that time restriction enhanced the impact of goals on attitudes with respect to the favourability of correct recall. There was no evidence that restricting time during processing and retrieval moderated the effect, nor was there evidence that a 48 hour time delay between exposure and recall enhanced biasing effects.

Only measures looking at the favourability of correctly recalled information provided evidence of congeniality. The recognition memory indices failed to show such evidence. As mentioned before, it may be that because recognition tasks are easier than recall tasks, participants have high rates of accuracy and thus bias does not manifest.

Experiment 2 took a step towards testing this hypothesis. As there was a 48 hour delay between exposure and the recognition task, it was expected that bias may be more likely to emerge. This was not the case. Out of 24 items, recognition errors were relatively low
in both Session 1 ($M = 5.30$, $SD = 2.84$) and Session 2 ($M = 6.67$, $SD = 3.12$). As recognition errors were still relatively infrequent after a two day delay, it may be that this time delay was not long enough to elicit biasing effects.

*Implications*

Up until this point, social psychologists have seemed to accept that attitude-memory effects do not exist. Based on the meta-analysis conducted (e.g., Eagly et al. 1999), this was a reasonable assumption. However, the past studies which comprised these meta-analyses did not include conditions under which congeniality seemed most likely to occur. For example, many of these studies warned participants of an impending memory task, told participants that the purpose of the experiment was to study learning, allowed unlimited time for processing the information, provided multiple opportunities for processing information, and finally, many openly provided participants with accuracy goals during the memory task. Such conditions would make it difficult for bias to manifest as participants would have been focused on accuracy.

In contrast, the current research took steps to create conditions under which congeniality would be likely to emerge. Participants were not warned of a memory task, they were not told that the purpose of the study was to study learning, they were not allowed multiple opportunities to process the information, nor were they provided with accuracy goals. Specifically to address the issue of goals, participants were either provided with an information processing goal that was likely to elicit congeniality, a goal that was likely to elicit anti-congeniality, or presented them with no goal. Consistently, it was found that attitudes could influence memory, disputing previous conclusions. It was found that goals moderated these attitude effects. Attitude expressive goals consistently resulted in a congruency bias. When there was no goal present, no bias emerged. There
was some weak evidence that when an alternative perspective taking goal was present, an
anti-congruency bias emerged. The issue of processing time was also controlled,
however revealed no findings.

Although these results suggest that goals moderate attitude-memory effects, there
is a possible objection to this interpretation. It could be that the bias effects were
artefacts. That is, participants may have misunderstood the recall instructions and only
listed information that supported their particular goal (i.e., that which they would include
in their speech). This explanation for goals moderating the bias effects was not likely.
First, the instructions participants received at recall explicitly told participants to recall
what they could remember from the presented information, not just the information that
they would use for their speech. Second, if the recall instructions were misinterpreted, it
would be expected that participants would only list information for one side of the issue
(i.e. the information that would best serve their goal). This was not the case as almost all
participants recalled information that was both goal-congruent and incongruent. As such,
it seems likely that the effects were a memory effect rather than an artefact.

Another potential objection could be raised based on the fact that those who
received no information processing goal were not presented with a video camera and did
not face the threat of a speech. Presumably, the video camera may have increased
participant self-awareness, thus directing focus inwards resulting in the activation of
attitudes which would increase the chance of attitudes influencing memory bias in the
goal conditions, but not the no-goal conditions. This is unlikely for two reasons. First, all
participants regardless of goal condition were asked to repeatedly express their attitude
prior to receiving their goal manipulations or being presented with information. As such,
all participants would have been aware of their attitudes and so this is not a major
concern. Secondly, even if self-awareness did make participants further aware of their attitudes, this self-awareness cannot explain the reversal of biasing effects between the attitude-expressive and the alternative perspective taking goal conditions that was present in Study One.

Although there was encouraging evidence for information processing goals moderating the effects of attitude, the evidence for time restriction was much less compelling. It was perplexing that time restrictions twice failed to accentuate the interaction between goals and attitude. Within the second experiment where time restriction was present at both exposure and retrieval, when looking at correct recall proportions, both those who were restricted and unrestricted tend to recall similar proportions of correct information. During the first session, those who faced time restriction correctly recalled approximately the same proportion of correct information \( (M = .82, SD = .23) \) as those in the time restricted condition \( (M = .81, SD = .20) \). Although differences were more noticeable in Session 2, for the most part, the proportion of correctly recalled information in the restricted condition \( (M = .77, SD = .16) \) was similar those in the unrestricted condition \( (M = .83, SD = .17) \). In hindsight, it seems possible that the “unrestricted” time condition may have actually restricted the motivation of participants to process information. Recall that in the time unrestricted conditions, participants were given 45 seconds to process each information passage. This time was chosen as it was far more time than any individual needed to read the passage so that no participant would be restricted. What did participants do with the extra time? Perhaps participants let their minds wander to some degree and thought about other things. By the second or third screen, participants were likely bored. Boredom, or lack of motivation, could have prevented participants from actively processing the information, thus working
as a restriction. In light of this, it was perhaps not entirely surprising that the time restriction conditions did not differ, and in fact, this could be considered further support for the current theoretical perspective.

Another aspect of the current theoretical perspective that was not supported was the lack of goals moderating memory bias during Session 2 of the second experiment, even though this was found in both Experiment 1 and Session 1. A simple explanation for this would be if participants forgot the information which they were presented and thus there was no variability in recall resulting in the failure of bias to appear. Surprisingly, as previously noted, recall was almost just as good during the second session as it was in the first. As was mentioned in the discussion of Experiment 2, it could be that attitudes produced memory effects at a specific stage of information processing and thus the saliency of goals at these stages is important. For example, goals may have moderated the effect of attitudes on the favourability of correct recall at exposure so that participants processed to a greater degree the information that was consistent with that goal. Strictly speaking, it may be that the moderating effect of goal results from an exposure effect. That is, an individual receives a goal at exposure and processes in a manner consistent with that goal, which could result in larger memory traces for that information. An equally plausible, but not mutually exclusive, explanation is that the bias emerges at retrieval. In this situation, it may be easier to retrieve specific information when one is focused on a goal. Experiment 2 speaks to this issue. In Session 1, participants were told of their goal just prior to exposure, and were reminded of it just prior to retrieval so that goals presumably had an impact at both stages of processing. During the second session, this was no longer the case. Participants prior to retrieval were not reminded of their goal, nor were they led to believe that a video session
was impending so thus goals would not have much, if any, impact. In this situation, goals did not moderate memory bias. It may be that since there was no salient goal present at retrieval, goals did not act as moderators. This finding implies that bias must be, at least in part, driven by processes at retrieval; if bias was purely an exposure effect, one would expect the bias to carry over.

Although the favourability of correct recall failed to confirm all of the hypotheses put forward by the current theoretical perspective, recognition data failed to confirm any hypotheses. Within the favourability of correct recognition index, there was no evidence for attitude-memory effects. This may have been due to the fact that recognition was such an easy task that bias failed to emerge. This is supported by the fact that even after a 48 hour delay, when tested with 24 recognition items, participants made relatively few errors ($M = 6.67, SD = 3.12$). It might be difficult for bias to emerge with such high accuracy rates. It may, however, be that in the time restricted conditions bias failed to appear as participants were not restricted while completing the task, as they were in the recall task of Experiment 2. Perhaps by limiting the time in which participants have to respond to the individual recognition items, bias would be more likely to emerge.

**Future Directions**

Although the current research sheds light on the nature of attitude-memory effects, it also brought attention to many factors which need further exploration. The first of these factors is time restriction during exposure. As noted, it was possible that boredom may have interfered with processing in the unrestricted time conditions. If participants were able to read and progress through the information at their own pace, this confound would be eliminated. As such, in the future, programming of the time unrestricted
conditions should allow participants to move onto the next piece of information at their leisure so as to accommodate individual differences in reading ability.

Not only does time restriction at exposure need to be explored, but time restriction at retrieval also needs exploration. As with exposure time, it may also be that the 20 minutes allotted to the recall task was too long. Participants who did not face restriction at recall were aware that they had 20 minutes to complete the task. Perhaps again, this over-allotment of time created boredom and reduced motivation to engage in the task. In order to reduce this problem, participants could be allowed to move onto the next section of the study once they have completed the recall task to their satisfaction.

Whereas Experiment 2 limited some participants during recall, the current project failed to carry the time restriction into the recognition tasks which may have limited the chance for bias to fully emerge. Future studies should not only restrict time during exposure and recall, but should also restrict the amount of time participants have during recognition tasks.

Finally, with respect to time restrictions, it would be interesting to extend time restrictions to the memory tasks of the second session. Although in Experiment 2 participants were limited at recall, this limit was only in place for Session 1. Perhaps if time had been properly restricted during Session 2, it may have accentuated attitude-memory effects.

If through more careful manipulation of time restriction there is evidence of this restriction accentuating the moderating effects of information processing goals, research should address other potential cognitive capacity restrictions. Perhaps the effects of capacity restrictions vary depending on the restriction encountered. Examples of restrictions to be explored include both those restrictions that limit ability and motivation.
For example, capacity restrictions that target ability could involve the implementation of a distracter task or a very difficult task. Alternatively, restrictions that limit motivation could include manipulations of personal involvement or need for cognition.

Although capacity restrictions in general need to be further explored, this research could greatly benefit from research addressing the effects of attitudes at different stages of processing. As was shown in Experiment 2, it seems possible that goals exert differing impacts at exposure and retrieval. It is possible to manipulate precisely the stage of processing at which participants receive their information processing goals. For example, in one condition participants could receive their goal only at exposure whereas in a second condition, participants would only receive their goal at retrieval. A third condition would have participants receive their goal at both phases of information processing and a control condition would not present participants with any goal. This would give an initial indication of where goals moderate the impact of attitude on memory.

In summary, this thesis provided some initial support for the current theoretical perspective with respect to the impact of information processing goals. This thesis furthered the field of attitude-memory by exploring the nature of the conditions under which congeniality is most likely to occur. Through careful exploration of past research, this thesis was able to shed light onto commonalities of past studies which likely hindered the emergence of attitude-memory biases, and created conditions which consistently elicited attitude-memory effects within the favourability of correct recall index.

However, this thesis also highlighted areas that need further exploration. Specifically, the nature of different capacity restrictions and the effects of attitudes at different stages of information processing need to be carefully manipulated so as to better understand this complex relationship.
References


Appendix A

EAT
Information Sheet

This study is being conducted by a Graduate Student (Meghan MacDonald) under the supervision of Dr. Leandre R. Fabrigar, a Psychology Professor at Queen’s University in Kingston, Ontario. Meghan MacDonald will be running your session today.

In this study, you will be asked presented with information about either the eating of red meat, contact sports or marijuana use. You will then be asked to provide your opinion towards the topic and will be asked questions related to this topic. This study will not take longer than 60 minutes to complete.

You will receive 1% course credit or $5 for your participation in this study.

Your participation in this study is voluntary and you are free to withdraw at any time without penalty. If you choose to withdraw, you may also ask that your data in not used in analysis. You may also choose not to answer any question that you find objectionable or that makes you feel uncomfortable. This study has no known physical or psychological risks.

Please be assured that the data will be kept in a secure location, that all of your responses will be coded to conceal your identity, and that your responses will be pooled with those of a larger number of individuals. Thus, individual results will not be available to you and your responses will remain confidential and anonymous; only authorized researchers will have access to the data. The data will be published in aggregate form only.

In the event that you have any questions, concerns, or complaints about this research, please feel free to contact Meghan MacDonald (meghan_e_macdonald@yahoo.ca), Dr. Leandre R. Fabrigar (fabrigar@post.queensu.ca), Dr. Vernon Quinsey (Head of the Queen’s Psychology Department, 533-2492), or the Queen’s University General Research Ethics Board, c/o Queen’s University Research Services (533-6081).

Please feel free to ask any questions now.

Thank you for your time. Your interest in participating in this research study is greatly appreciated.
EAT
Consent Form

Name (please print clearly): _________________________________________________

1. I have read the information sheet and have had any questions answered to my satisfaction.

2. I understand that I will be participating in a study entitled EAT and that I will be presented with information regarding vegetarianism and then will be asked questions regarding this topic which will take approximately 60 minutes.

3. I understand that my participation in this study is voluntary and that I may choose not to answer any questions and to terminate my participation at any time. I understand that such withdrawal will have no adverse consequences.

4. I understand that I may choose not to answer any question that I find objectionable or that makes me feel uncomfortable.

5. I understand that the anonymity and confidentiality of my responses will be maintained now and in the future.

6. I understand that individual results will not be made available but I am entitled to a debriefing at the completion of the study in which the purpose and expected outcome will be made available to me.

7. If I have any questions concerns or complaints, I understand that I may contact Meghan MacDonald (meghan_e_macdonald@yahoo.ca), Dr. Leandre R. Fabrigar (fabrigar@post.queensu.ca), Dr. Vernon Quinsey (Head of the Queen’s Psychology Department, 533-2492), or the Queen’s University General Research Ethics Board, c/o Queen’s University Research Services (533-6081).

I have read the above statements and freely consent to participating in this research:

Signature: ________________________________ Date: __________________________
EAT
Debriefing Form

There has been a great deal of research conducted with respect to information processing and memory, however, research has been inconsistent with some studies suggesting that people remember attitude consistent information while others refute this finding. This study seeks to extend attitude-memory research by placing restrictions on participants that can be expected in daily situations. For example, some of you were placed in a situation where you completed a task that was consistent with your attitude. Others were in a situation where you completed a task that was inconsistent with your attitude. In addition, some of you were restricted in the amount of time you had to read the information. These restrictions will help to fill in the gaps within attitude-memory research by creating a need for bias in both information processing and memory.

In the event that you would like to see a counsellor about this deception regarding the presentation of inaccurate information, please contact Health, Counselling and Disabilities Services at 533-2506. They are located at 146 Stuart in the St. LaSalle Bldg, (across the street from Adelaide Hall). Also, please feel free to talk to the experimenter for more information on the information presented to you.

You should be aware that the information you read about was constructed by the experimenter for use in this study. Thus you should be aware that the information communicated to you is not necessarily accurate.

Regarding the topics of research addressed here, below is a list of some related references that might be of interest to you should you like to obtain further information on attitudes:


In the event that you have any questions, concerns, or complaints about this research, please feel free to contact Meghan MacDonald (meghan_e_macdonald@yahoo.ca), Dr. Leandre Fabrigar (533-6492), Dr. Vernon Quinsey (533-2492), Head of the Psychology Department, Queen’s University, or the Queen’s University General Research Ethics Board, c/o Queen’s University Research Services (533-6081). If you are interested in obtaining information about the results of the study once it is completed feel free to contact Dr. Leandre Fabrigar (533-6492).

This is an ongoing research project: PLEASE DO NOT DISCUSS THIS PROJECT WITH ANYONE, as knowledge about the procedure or our goals may alter the results we obtain from future participants. Thank you for your cooperation.

Finally, thank you for your participation in this project.

Meghan MacDonald
Appendix B

Opening Instructions

Welcome to the study "Eat." This program will bring you through some information and questions regarding a specific topic. Please read all instructions carefully. Thank you!
Red Meat Attitude Measure

The following are is a list of words that could be used to describe your overall evaluation of an object. Please use the following scales to describe your evaluation of the eating of red meat. If the word "definitely" describes your evaluation of the eating of red meat, then circle the number "7". If you decide that the word does not at all describe your evaluation of the eating of red meat, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

Dislike:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely

Good:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely

Undesirable:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely

Bad:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely

Like:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely

Positive:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely

Negative:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely

Desirable:

1 – 2 – 3 – 4 – 5 – 6 – 7
Not at All Definitely
Marijuana Attitude Measure

The following are is a list of words that could be used to describe your overall evaluation of an object. Please use the following scales to describe your evaluation of marijuana use. If the word "definitely" describes your evaluation of marijuana use, then circle the number "7". If you decide that the word does not at all describe your evaluation of marijuana use, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

**Dislike:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All

**Good:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All

**Undesirable:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All

**Bad:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All

**Like:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All

**Positive:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All

**Negative:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All

**Desirable:**

1 – 2 – 3 – 4 – 5 – 6 - 7
Not at All
Contact Sports Attitude Measure

The following are a list of words that could be used to describe your overall evaluation of an object. Please use the following scales to describe your evaluation of contact sports (i.e. hockey, football, and boxing) as a regular pastime. If the word "definitely" describes your evaluation of contact sports as a pastime, then circle the number "7". If you decide that the word does not at all describe your evaluation of contact sports as a pastime, then circle the number "1". Use the intermediate numbers between 1 and 7 to indicate responses between these two extremes.

Work rapidly. Your first reaction is best. Please mark all words. This should only take a minute or two. Please begin.

| Dislike: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |

| Good: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |

| Undesirable: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |

| Bad: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |

| Like: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |

| Positive: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |

| Negative: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |

| Desirable: | 1 – 2 – 3 – 4 – 5 – 6 – 7 |
| Not at All | Definitely |
Goal Manipulations

**Attitude-Expressive Red Meat Goal Instruction:**

On the following screens you will have the opportunity to read through some information about red meat.

As you read this information, keep in mind your current opinion toward the eating of red meat which you have just provided to us. One of the things we are trying to do in this study is to understand how people articulate opinions. Later in this study, you will be asked to give a short speech detailing as many arguments as you can which support your opinion regarding the eating of red meat. Keep in mind you are being asked to provide arguments supporting your opinion regarding the eating of red meat, and not necessarily arguments supporting the eating of red meat itself. In addition, the people you will be speaking to will generally agree with your opinion of eating red meat. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Please press continue when you are ready.

**Alternative Perspective Taking Red Meat Goal Condition Instructions:**

On the following screens you will have the opportunity to read through some information about the eating of red meat.

As you read this information, keep in mind your current opinion toward eating of red meat which you have just provided to us. One of the things we are trying to do in this study is to understand how people articulate opinions. Later in this study, you will be asked to give a short speech detailing as many arguments as you can which are counter to your opinion regarding the topic of eating of red meat. Keep in mind you are being asked to provide arguments that do not support your opinion but that would support those who are in opposition to you in their opinions regarding eating of red meat. In addition, the people you will be speaking to will generally disagree with your opinion of eating of red meat, and we want you to generate arguments that would support these people. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Please press continue when you are ready.

**No Goal Red Meat Condition Instructions:**

On the following screens you will have the opportunity to read through some information about the eating of red meat.

Please press continue when you are ready.
Attitude-Expressive Marijuana Goal Instruction:

On the following screens you will have the opportunity to read through some information about marijuana use.

As you read this information, keep in mind your current opinion toward marijuana use which you have just provided to us. One of the things we are trying to do in this study is to understand how people articulate opinions. Later in this study, you will be asked to give a short speech detailing as many arguments as you can which support your opinion regarding marijuana use. Keep in mind you are being asked to provide arguments supporting your opinion regarding marijuana use, and not necessarily arguments supporting marijuana use itself. In addition, the people you will be speaking to will generally agree with your opinion of marijuana use. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Please press continue when you are ready.

Alternative Perspective Taking Marijuana Goal Condition Instructions:

On the following screens you will have the opportunity to read through some information about marijuana use.

As you read this information, keep in mind your current opinion toward marijuana use which you have just provided to us. One of the things we are trying to do in this study is to understand how people articulate opinions. Later in this study, you will be asked to give a short speech detailing as many arguments as you can which are counter to your opinion regarding the topic of marijuana use. Keep in mind you are being asked to provide arguments that do not support your opinion but that would support those who are in opposition to you in their opinions regarding marijuana use. In addition, the people you will be speaking to will generally disagree with your opinion of marijuana use, and we want you to generate arguments that would support these people. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Please press continue when you are ready.

No Goal Marijuana Instructions:

On the following screens you will have the opportunity to read through some information about marijuana use.

Please press continue when you are ready.
Attitude-Expressive Contact Sports Goal Instruction:

On the following screens you will have the opportunity to read through some information about contact sports (i.e. hockey, football, and boxing) as a pastime.

As you read this information, keep in mind your current opinion toward contact sports as a pastime which you have just provided to us. One of the things we are trying to do in this study is to understand how people articulate opinions. Later in this study, you will be asked to give a short speech detailing as many arguments as you can which support your opinion regarding contact sports as a pastime. Keep in mind you are being asked to provide arguments supporting your opinion regarding contact sports as a pastime, and not necessarily arguments supporting contact sports as a pastime itself. In addition, the people you will be speaking to will generally agree with your opinion of contact sports as a pastime. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Please press continue when you are ready.

Alternative Perspective Taking Contact Sports Goal Condition Instructions:

On the following screens you will have the opportunity to read through some information about contact sports (i.e. hockey, football, and boxing) as a pastime.

As you read this information, keep in mind your current opinion toward contact sports as a pastime which you have just provided to us. One of the things we are trying to do in this study is to understand how people articulate opinions. Later in this study, you will be asked to give a short speech detailing as many arguments as you can which are counter to your opinion regarding the topic of contact sports as a pastime. Keep in mind you are being asked to provide arguments that do not support your opinion but that would support those who are in opposition to you in their opinions regarding contact sports as a pastime. In addition, the people you will be speaking to will generally disagree with your opinion of contact sports as a pastime, and we want you to generate arguments that would support these people. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Please press continue when you are ready.

No Goal Contact Sports Instructions:

On the following screens you will have the opportunity to read through some information about contact sports as a pastime (i.e. hockey, football, and boxing).

Please press continue when you are ready.
Red Meat Information Presentation and Instructions for Participants

The next section of this study will present you with a variety of information on the topic of eating red meat. The computer will present you with this information. Please read the information as it is presented to you.

Red Meat Triggers Biological Response Indicating Quality Food Source:

The fat that is present in red meat not only represents a high-quality source of energy, but is also an important quality factor. The juiciness and aroma of meat and meat products are largely determined by the fat content. In addition, the fat from meat that comes off of muscle contains fatty acids that are indispensable for humans, and therefore has a very high nutritional value, resulting in increases in physiological health.

Free Range Does Not Mean OK!

Companies want consumers to believe that products labeled "free-range" come from animals who spent their short lives outdoors, enjoying sunshine, fresh air, and in the company of other animals. Labels, other than "certified organic," are not subject to any government regulations which means that no matter how animals are treated, they can still be sold as "free-range." Consuming these products encourages the mistreatment of animals as it allows producers to mistreat animals by tricking shoppers.

Red Meat Provides Satiation and Helps Weight Loss:

Those who only eat chicken and fish as sources of meat are missing out! The protein compounds in chicken and fish are not as dense as those in red meat. Since protein is associated with "keeping us fuller longer" these less dense sources of protein do not achieve this goal. Those who do not include red meat as a source of red meat in a healthy diet have been reported as having higher obesity rates as a result of needing to eat more in order to feel "full."

Red Meat is one of the Most Biologically Valuable Food Sources:

Red meat is not only one of the very oldest foods for humans, but is also one the most biologically valuable. This fact is mainly due to its high protein content. In addition, the human requirement for vitamins and iron is also covered by eating meat which is key in maintaining peak human performance. It is therefore not surprising that meat has an especially high importance in the menu planning of those people who have to deliver extreme performances such as athletes and public figures.

Red Meat Contains Dangerous Additives:

There's a chemical additive that food manufacturers add to virtually all processed red meat products: breakfast sausage, picnic ham, hot dogs, bacon, bologna and many more. This chemical additive is used to give these meats a reddish color so they don't look putrid gray (which is the normal color of weeks-old packaged meat). By itself, this
ingredient sounds completely harmless, but when you eat it, it forms highly carcinogenic chemical compounds known as nitrosamines. It is listed in the ingredients as sodium nitrate. (Just think—should all pieces of meat in a meat case REALLY be the same colour?)

Red Meat is Laden with Contaminates:

Products coming from mammals are a health hazard, including meat and dairy products. They contain no fiber or complex carbohydrates and are laden with saturated fat and cholesterol. They are contaminated with cow's blood and pus and are frequently contaminated with pesticides, hormones, and antibiotics. Meat and dairy products from mammals are linked to allergies, constipation, obesity, heart disease, cancer, and other diseases.

Lack of Red Meat in Diet Spells Disaster:

Red meat is a huge source of iron, folic acid, vitamin K and zinc. Those who abstain from eating these meats are unable to take in these needed vitamins as they come directly from stores within the meat. Unfortunately, multivitamins and other synthetic forms of these nutrients are not as efficient within the body and therefore those who do not eat red meat find themselves feeling tired, lacking motivation, and deficiencies have been shown to impact on unborn babies.

Red Meat Linked to Obesity:

According to the National Health Research Institute of Canada, those who eat red meat on a regular basis have been found to have higher obesity rates as a result of the high levels of "bad" cholesterol which is found among different red meat sources. While those who consumed "lean cut" red meat had lower cholesterol counts, they still had significantly higher obesity and cholesterol scores than those who did not eat red meat.

Red Meat NOT linked to Breast Cancer Rates:

Consumption of meat has been studied in connection with breast cancer as many claim that the two are linked. The Nurses' Health Study done by Harvard University followed almost 89,000 healthy, middle-aged women for 18 years, and their diets and health outcomes were monitored. The study was published in the March 20, 2003, International Journal of Cancer. It shows no association between eating meat and breast cancer.

Red Meat has been shown to contain dangerous compounds:

The US National Health Center found the following: 38% of meat and dairy samples in 10 cities were contaminated with sulfa drugs or other antibiotics. (This from the Centre for Science in the Public Interest and The Wall Street Journal, Dec. 29, 1989). A similar study in Washington, DC found a 20 percent contamination rate (Nutrition Action Healthletter, April 1990). These contamimates go directly into the human blood stream. These findings are unacceptable for human health.
Red Meat does NOT pose health risk:

Unfortunately, many people mistakenly believe that meat and poultry products contain high levels of antibiotic residues. Meat and poultry products are routinely tested by the Food Safety and Inspection Service of the U.S. Department of Agriculture for antibiotic residues, which if present at all, are typically at very low levels. Red meat is perfectly healthy to eat.

Eating Red Meat is Morally and Ethically Acceptable:

Since the beginning of time there has been a food chain. Lions eat zebras, spiders eat flies. Humans too eat other animals. This has been documented in the Bible, in cave pictures drawn by cavemen and other early texts. While the mistreatment of animals is ethically unacceptable, eating meat is not. Most food producers ensure proper treatment of animals, they are no longer being injected with hormones and actually live a decent life. It is not wrong to eat proper nutrition for healthy living-it is nature in which we are an animal like all the rest.
Marijuana Information Presentation and Instructions for Participants

The next section of this study will present you with a variety of information on the topic of marijuana use. The computer will present you with this information. Please read the information as it is presented to you.

Marijuana contains toxic chemicals:

Smoking marijuana is known to be toxic. While it is correct to say that marijuana contains chemicals that have useful medical benefits, marijuana usage is not without its drawbacks. Unfortunately, for those that may be helped medically by marijuana, marijuana contains toxic, psychoactive chemicals. In fact, marijuana contains over 400 chemicals which are known to dangerously interact with neurotransmitters in the brain.

Marijuana is useful in Relieving Pain:

By far the most well known use of marijuana is as a reliever of pain, or analgesic, especially in cases of chronic pain. There are many sufferers of chronic pain who smoke marijuana as a way of achieving relief. Smoking marijuana as a method of delivery is useful for those with constant pain. It is one of the quickest ways of feeling the effects and it also allows them to self-regulate their dosage. A pill or an injection would not be as easy for these people to control.

Marijuana is just as harmful as smoking cigarettes:

Smoking marijuana is known to be at least as toxic as smoking cigarettes. Users who only smoke pure marijuana leaves are at an increased risk for lung and mouth cancer and heart disease at levels at or above cigarette smokers. These results have been demonstrated in many studies in the past 8 years.

Marijuana in an inhaled form acts as an anti-asthmatic, anti-rheumatic and anti-inflammatory:

Well known uses for marijuana include using it as an anti-asthmatic, anti-rheumatic and anti-inflammatory. It seems especially strange that smoking marijuana could assist in preventing asthma when you are inhaling smoke into the lungs but many studies have been completed that document the benefits of marijuana in these areas. Additionally, smoking marijuana has been shown not only to reduce swelling in the lungs, but has been shown to reduce swelling in many areas of the body, making it beneficial for those experiencing joint and/or muscle pain.

Smoking a joint is a gateway to other drugs:

Marijuana is a gateway drug. By entering into a world of illegal substances, users are often introduced to much more than just marijuana. It has been shown that users of "hard" drugs such as cocaine, acid, heroine and ecstasy have 87.9% of the time started out by just "smoking a joint."
Medical Officials Say Marijuana Smoking is NOT harmful:

In 1972, after reviewing the scientific evidence, the National Commission on Marijuana and Drug Abuse concluded that while marijuana is not entirely safe, its dangers had been grossly overstated. This has been followed by the fact that in 1995, based on thirty years of scientific research, editors of the British journal Lancet (the British equivalent of New England Journal of Medicine) concluded that "the smoking of cannabis, even long term, is not harmful to health."

Smoking Marijuana results in major, permanent brain impairment:

Any time a foreign substance is induced into the body, especially into the brain, there are permanent changes to the body. In the case of marijuana, when it is brought into the brain via the lungs and the blood stream, it interacts with the chemicals in the brain, blocking certain receptors. These receptors primarily are those associated with memory and learning functions. The damage caused is irreversible.

Smoking Marijuana has major health benefits:

Marijuana (when smoked) has been shown to be effective in reducing nausea induced by cancer chemotherapy, stimulating appetite in AIDS patients, and reducing intraocular pressure in people with glaucoma. A cost/benefit analysis of using marijuana to achieve these results has shown that marijuana is less dangerous and more effective than other drugs currently on the market.

There is no such thing as "pure marijuana":

Often people are misled into believing that marijuana they have to smoke is "clean" with no additives. This is incorrect. The majority of marijuana plants are grown with dangerous pesticides to protect the plant from local insects. In addition, marijuana plants are grown in fertilizer which often contains lethal toxins to increase growth resulting in higher production rates. These chemicals are not washed off, and you cannot wash marijuana like you wash your vegetables. Those who choose to smoke marijuana are inhaling these chemicals, slowly poisoning themselves.

Smoking Marijuana does not cause addiction:

Most people who smoke marijuana smoke it only occasionally. A small minority of Americans --less than one percent - smoke marijuana on a daily or near-daily basis. An even smaller minority develops dependence on marijuana. Marijuana is not physically addictive. In fact, of those who drink alcohol and smoke marijuana, marijuana is used far less than alcohol and results in less social problems.

Smoking Marijuana does not harm the brain:
Marijuana produces immediate, temporary changes in thoughts, perceptions, and information processing. The cognitive process most clearly affected by marijuana is short-term memory. In laboratory studies, subjects under the influence of marijuana have no trouble remembering things they learned previously. However, they display diminished capacity to learn and recall new information. This diminishment only lasts for the duration of intoxication.

Marijuana has no medicinal benefit:

Marijuana has no medicinal benefit. Users experience a dulling sensation, similar to that of a cough syrup when one is sick. While this experience may result in moderate pain relief, there are other safer methods of pain relief that are monitored by health professionals.
Contact Sports Information Presentation and Instructions for Participants

The next section of this study will present you with a variety of information on the topic of contact sports as a pastime. The computer will present you with this information. Please read the information as it is presented to you.

Contact Sports Result in Increased Violence

Many athletes, small and large, end up in the hospital because of careless brutes intentionally attacking another player. This is not limited to local sports, but even in the NHL this happens, creating a poor model for upcoming young athletes. When hitting is allowed in any sport, increased aggression is sure to result.

Contact Sports allow for Better Fitness Achievement

It is not enough to train at the gym in order to achieve peak fitness. The body needs to learn to move quickly and to absorb impact in order for all muscles to be worked. Contact sports such as boxing, hockey and football allow for these unique body movements to be worked. This increases balance, allows for a better sense of center of gravity, strengthens joints, and gives a better overall awareness of the body.

Contact Sports May Increase Blood-Transmitted Diseases

In contact sports, it is common for an athlete to obtain an open wound. These wounds are often concealed from officials to prevent a stop in the play as in many sports no open wounds are permitted. The fact that there are hidden open wounds on the field of play creates a dangerous situation as athletes are continually coming into contact with one another. If a player unwittingly has a blood-transmitted illness, the disease can be easily spread.

Contact Sports Provide an Acceptable Outlet for Stress

Everyone needs to get out stress somehow. At some point in time everyone has felt the need to hit something, throw something or scream and yell. Contact sports allow for an acceptable way to release these feelings. Participants are governed by officials who make sure that rules are followed, there are often first-aid medics on hand, and protective gear is worn. This is a much more appropriate way to deal with natural feelings of aggression rather than alternatives.

Contact Sports Are Risky

Even when officials are diligently watching the game and enforcing rules, injury is a constant threat in contact sports. A hit gone wrong can result in permanent muscle damage or worse. Most athletes involved in contact sports have such injuries (i.e. torn ligaments, pulled muscles, ACL damage) and will never fully recover.

Contact Sports are Part of Human Nature
Since humans have lived in tribes, humans have had sporting events that are man against man. For example, there have always been types of wrestling matches. Jousting is another example of a past contact sport. It is not that humans are trying to hurt one another as much as humans are competitive by nature and need to show their worth. It is evolutionary for individuals to try and show their superiority, as in the past it was what determined if you got a mate.

Health Care Was Not Intended for Sports Injuries

Every year, thousands of people are admitted into emergency rooms for sports related injuries such as broken bones, torn muscles and eye damage. These are unnecessary visits and can be prevented. Sports are clearly a component in a healthy lifestyle, however, they do not need to involve heavy contact which results in a waste of medicare.

Contact Sports are Safe

In all official regulated sports, participants must wear protective gear. This protective gear has been tested and deemed safe by credible sources. If contact sports were not safe, there would be a public outcry from parents and spectators as well as athletes. There are rules in place to prevent injury and most of these sports are government supported.

Televised Contact Sports Result in Obesity and Other Problems

Not only are contact sports dangerous to those who play them, but they are also dangerous to those who watch them on television. Often associated with televised football, hockey, boxing and other contact sports are beer, nachos, and chicken wings. As a result, avid watchers of contact sports are often obese and have serious health problems. In addition, statistics show that the most amount of Drunk Driving accidents occur on Super Bowl Sunday. These sporting events not only hurt those who watch them, but also innocents on the road.

Athletes Are Aware and Accepting of Risks

Athletes and parents of athletes are well aware of any physical risks associated with their sport. Waivers need to be signed in any sport to inform athletes of these risks. Based on sound judgment, participants choose to participate. If individuals felt that an unnecessary amount of risk was involved in a given sport, they would not participate. For this reason, contact sports are perfectly safe and reasonable pastimes.

Playing Field has Turned Into Battlefield

No longer is a football field or hockey rink simply a place to go and have some fun. Lately, reports have shown that bullying reigns supreme not only on the playground, but even more dangerously in sports. In school sanctioned sporting events, the number one cause of injury is not accidental, but intentional injury of someone for a personal reason. Reasons may include 'looking at my friend the wrong way' or 's/he had it coming.'
Referees are not able to punish these attacks as they are covered by the rule book, leaving athletes to pick themselves up from an assault with no defence.

Contact Sports Provide Fun For Participants and Observers.

Contact sports are not only fun for those playing, but also for those cheering on the sidelines. Sporting events allow an opportunity for people to come together and cheer for others and to gather socially and have some fun. This not only provides enjoyment for the spectators but is also an ego booster for those participating. Support can be shown for others and sports are often a common scene for bonding, something that seems to lack in day to day living.
Recall Instructions

**Attitude Expressive Goal Red Meat Recall Instructions**

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments supporting your opinion regarding the eating of red meat, and not necessarily arguments supporting the eating of red meat itself. In addition, the people you will be speaking to will generally agree with your opinion of eating red meat. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.

**Alternative Perspective Taking Goal Red Meat Recall Instructions**

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments that do not support your opinion but that would support those who are in opposition to you in their opinions regarding the eating of red meat. In addition, the people you will be speaking to will generally disagree with your opinion of the eating of red meat, and we want you to generate arguments that will support these people. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.

**No Goal Red Meat Recall Instructions**

We are interested in what you remember from the previously presented information. Thus at this point we would like you to recall what you can remember from the previously presented information. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.
Attitude Expressive Goal Marijuana Recall Instructions

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments supporting your opinion regarding marijuana use, and not necessarily arguments supporting marijuana use itself. In addition, the people you will be speaking to will generally agree with your opinion of marijuana use. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.

Alternative Perspective Taking Goal Marijuana Recall Instructions

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments that do not support your opinion but that would support those who are in opposition to you in their opinions regarding marijuana. In addition, the people you will be speaking to will generally disagree with your opinion of marijuana use, and we want you to generate arguments that will support these people. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.

No Goal Marijuana Recall Instructions

We are interested in what you remember from the previously presented information. Thus at this point we would like you to recall what you can remember from the previously presented information. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.
Attitude Expressive Goal Contact Sports Recall Instructions

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments supporting your opinion regarding contact sports as a regular pastime, and not necessarily arguments supporting contact sports as a regular pastime itself. In addition, the people you will be speaking to will generally agree with your opinion of contact sports as a regular pastime. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.

Alternative Perspective Taking Goal Contact Sports Recall Instructions

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments that do not support your opinion but that would support those who are in opposition to you in their opinions regarding contact sports as a regular pastime. In addition, the people you will be speaking to will generally disagree with your opinion of contact sports as a regular pastime, and we want you to generate arguments that will support these people. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.

No Goal Contact Sports Recall Instructions

We are interested in what you remember from the previously presented information. Thus at this point we would like you to recall what you can remember from the previously presented information. Only place one piece of information in each box. You will have 20 minutes to complete this task. Please sit quietly when you have finished.
Red Meat Recognition Task Items and Instructions

Please read the following statements and indicate if the information is true or false based on the information previously presented to you.

(T = was presented, F = not presented)

T- The fatty acids from red meat are indispensable for humans.

TRUE   FALSE

F- Red meat has been shown to have more nutritional benefit than any other type of food.

TRUE   FALSE

T- "Free range" written on food items does not mean it necessarily is a free-range product.

TRUE   FALSE

F- Meat products that truly are "Free Range" are no better nutritionally than those that are not, yet cost over 50% more.

TRUE   FALSE

T- The protein in red meat can help with weight loss as it keeps you fuller longer.

TRUE   FALSE

F- Red significantly reduces the risks of depression.

TRUE   FALSE

T- Red meat aids in the achievement of peak performance.

TRUE   FALSE

F- Red meat has been shown to have far higher protein content than nuts and lentils.

TRUE   FALSE

T- Sodium nitrate is added to meat to give it the "red" colour.

TRUE   FALSE

F- Nitrosamines are protein blockers found in red meat.

TRUE   FALSE

T- Red meat contains no fiber or complex carbohydrates.

TRUE   FALSE

F- Red meat has been shown to cause digestive tract degeneration as it contains no nutrients besides protein.

TRUE   FALSE

T- Red meat is a huge source of iron, folic acid, vitamin K, and zinc.
F- One serving of red meat provides as many nutrients as a week's worth of multivitamins.
TRUE FALSE

T- Red meat on a regular basis is linked to obesity.
TRUE FALSE

F- "Lean cuts" of red meat are linked to osteoporosis as healthy fat, needed for bone maintenance, is removed.
TRUE FALSE

T- Red meat has not been found to have an association to breast cancer.
TRUE FALSE

F- The impact of red meat consumption on breast cancer has shown that red meat helps fight breast cancer when the cancer is already present.
TRUE FALSE

T- Between 20-38% of red meat samples contain some sort of antibiotic.
TRUE FALSE

F- Red meat products have been shown to contain birth control hormone to prevent cattle from becoming pregnant just prior to slaughtering.
TRUE FALSE

T- Meat and poultry are routinely tested for antibiotic residue. If any residue is found, it is typically at low levels.
TRUE FALSE

F- Most people do not believe claims of antibiotics in meat are true, which is correct.
TRUE FALSE

T- Humans are part of the food chain—it is ethically acceptable to eat red meat.
TRUE FALSE

F- It is okay to mistreat animals if they are being used as a food source—it is a part of our history.
TRUE FALSE
Marijuana Recognition Task Items and Instructions

Please read the following statements and indicate if the information is true or false based on the information previously presented to you.

(T = was presented, F = not presented)

T- Marijuana contains toxic chemicals
   TRUE   FALSE

F- Marijuana contains over 400 chemicals that have been linked to such diseases as Parkinson’s and Alzheimer’s.
   TRUE   FALSE

T- Smoking marijuana is one of the quickest ways to feel its pain relieving effects.
   TRUE   FALSE

F- An injection or pill containing marijuana is the most effective way to benefit from pain relief.
   TRUE   FALSE

T- Those who smoke marijuana are at an increased risk for lung and mouth cancer.
   TRUE   FALSE

F- Those who smoke 'pure marijuana' leaf for at least 8 years are significantly more prone to addiction.
   TRUE   FALSE

T- Marijuana has been shown to reduce swelling in the lungs, making it an ideal treatment for asthma.
   TRUE   FALSE

F- Marijuana allows for arthritic patients to be virtually pain-free for long periods of time.
   TRUE   FALSE

T- Users of "hard" drugs often start with marijuana.
   TRUE   FALSE

F- Marijuana use causes individuals to become involved with the "wrong crowd," often creating devastating family problems.
   TRUE   FALSE

T- Smoking marijuana can block certain receptors in the brain, especially those related to memory and learning.
   TRUE   FALSE
F- Marijuana prohibits neuron firing in the brain. Sometimes, this can lead to areas of the brain permanently dying, especially those areas related to locomotion.

TRUE    FALSE

T- In cancer pain management, marijuana is less dangerous and more effective than other drugs on the market.

TRUE    FALSE

F- Marijuana has been shown to aid in kidney dialysis.

TRUE    FALSE

T- The majority of marijuana plants are grown with dangerous pesticides in toxic fertilizer.

TRUE    FALSE

F- Blood tests of marijuana users have shown dangerous toxins that are not found in non-users.

TRUE    FALSE

T- Marijuana is not physically addictive.

TRUE    FALSE

F- Smoking marijuana does not impact social relationships.

TRUE    FALSE

T- Lab studies show that people under the influence of marijuana have no trouble remembering things learned previously.

TRUE    FALSE

F- Marijuana does not produce any change in terms of thoughts, perceptions and information processing.

TRUE    FALSE

T- Marijuana may produce a pain dulling sensation but it has no medicinal benefit.

TRUE    FALSE

F- Marijuana does not result in pain relief.

TRUE    FALSE

T- According to the British Journal Lancet, smoking marijuana is not harmful to health.

TRUE    FALSE

F- In 1972 a study was published that stated the dangers of marijuana have been greatly overestimated.

TRUE    FALSE
Contact Sports Recognition Task Items and Instructions

Please read the following statements and indicate if the information is true or false based on the information previously presented to you.

(T = was presented, F = not presented)

T- Marijuana contains toxic chemicals
   TRUE   FALSE

F- Marijuana contains over 400 chemicals that have been linked to such diseases as Parkinson’s and Alzheimer’s.
   TRUE   FALSE

T- Smoking marijuana is one of the quickest ways to feel its pain relieving effects.
   TRUE   FALSE

F- An injection or pill containing marijuana is the most effective way to benefit from pain relief.
   TRUE   FALSE

T- Those who smoke marijuana are at an increased risk for lung and mouth cancer.
   TRUE   FALSE

F- Those who smoke 'pure marijuana' leaf for at least 8 years are significantly more prone to addiction.
   TRUE   FALSE

T- Marijuana has been shown to reduce swelling in the lungs, making it an ideal treatment for asthma.
   TRUE   FALSE

F- Marijuana allows for arthritic patients to be virtually pain-free for long periods of time.
   TRUE   FALSE

T- Users of "hard" drugs often start with marijuana.
   TRUE   FALSE

F- Marijuana use causes individuals to become involved with the "wrong crowd," often creating devastating family problems.
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T- Smoking marijuana can block certain receptors in the brain, especially those related to memory and learning.
   TRUE   FALSE
F- Marijuana prohibits neuron firing in the brain. Sometimes, this can lead to areas of the brain permanently dying, especially those areas related to locomotion.

TRUE  FALSE

T- In cancer pain management, marijuana is less dangerous and more effective than other drugs on the market.

TRUE  FALSE

F- Marijuana has been shown to aid in kidney dialysis.

TRUE  FALSE

T- The majority of marijuana plants are grown with dangerous pesticides in toxic fertilizer.

TRUE  FALSE

F- Blood tests of marijuana users have shown dangerous toxins that are not found in non-users.

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TRUE  FALSE

F- Marijuana does not result in pain relief.

TRUE  FALSE

T- According to the British Journal Lancet, smoking marijuana is not harmful to health.

TRUE  FALSE

F- In 1972 a study was published that stated the dangers of marijuana have been greatly overestimated.

TRUE  FALSE
Red Meat Post-Attitude Measure

The following section measures attitudes towards the eating of red meat. Please read each statement and respond honestly. All answers are completely anonymous.

To what extent would you say you are in favour of the eating of red meat?

1   –   2   –   3   –   4   –   5   –   6   -   7                               X
Not at All                     Definitely       Prefer Not to Say

To what extent would you say the eating of red meat is worthwhile?

1   –   2   –   3   –   4   –   5   –   6   -   7                               X
Not at All                     Definitely       Prefer Not to Say

To what extent would you say the eating of red meat is bad thing?

1   –   2   –   3   –   4   –   5   –   6   -   7                               X
Not at All                     Definitely       Prefer Not to Say

To what extent would you say the eating of red meat is good thing?

1   –   2   –   3   –   4   –   5   –   6   -   7                               X
Not at All                     Definitely       Prefer Not to Say

To what extent would you say the eating of red meat is useful?

1   –   2   –   3   –   4   –   5   –   6   -   7                               X
Not at All                     Definitely       Prefer Not to Say

To what extent would you say you are against the eating of red meat?

1   –   2   –   3   –   4   –   5   –   6   -   7                               X
Not at All                     Definitely       Prefer Not to Say
Marijuana Use Post-Attitude Measure

The following section measures attitudes towards marijuana use. Please read each statement and respond honestly. All answers are completely anonymous.

To what extent would you say you are in favour of marijuana use?

1   –   2   –   3   –   4   –   5   –   6   -   7
Not at All                      Definitely   Prefer Not to Say

To what extent would you say marijuana use is worthwhile?

1   –   2   –   3   –   4   –   5   –   6   -   7
Not at All                      Definitely   Prefer Not to Say

To what extent would you say marijuana use is bad thing?

1   –   2   –   3   –   4   –   5   –   6   -   7
Not at All                      Definitely   Prefer Not to Say

To what extent would you say marijuana use is good thing?

1   –   2   –   3   –   4   –   5   –   6   -   7
Not at All                      Definitely   Prefer Not to Say

To what extent would you say marijuana use is useful?

1   –   2   –   3   –   4   –   5   –   6   -   7
Not at All                      Definitely   Prefer Not to Say

To what extent would you say you are against marijuana use?

1   –   2   –   3   –   4   –   5   –   6   -   7
Not at All                      Definitely   Prefer Not to Say
Contact Sports Post-Attitude Measure

The following section measures attitudes towards contact sports as a regular pastime. Please read each statement and respond honestly. All answers are completely anonymous.

To what extent would you say you are in favour of contact sports (i.e. hockey, football, and boxing) as a regular pastime?

1 – 2 – 3 – 4 – 5 – 6 – 7 X
Not at All Definitely Prefer Not to Say

To what extent would you say contact sports (i.e. hockey, football, and boxing) as a regular pastime are worthwhile?

1 – 2 – 3 – 4 – 5 – 6 – 7 X
Not at All Definitely Prefer Not to Say

To what extent would you say contact sports (i.e. hockey, football, and boxing) as a regular pastime are a bad thing?

1 – 2 – 3 – 4 – 5 – 6 – 7 X
Not at All Definitely Prefer Not to Say

To what extent would you say contact sports (i.e. hockey, football, and boxing) as a regular pastime are a good thing?

1 – 2 – 3 – 4 – 5 – 6 – 7 X
Not at All Definitely Prefer Not to Say

To what extent would you say contact sports (i.e. hockey, football, and boxing) as a regular pastime are useful?

1 – 2 – 3 – 4 – 5 – 6 – 7 X
Not at All Definitely Prefer Not to Say

To what extent would you say you are against contact sports (i.e. hockey, football, and boxing) as a regular pastime?

1 – 2 – 3 – 4 – 5 – 6 – 7 X
Not at All Definitely Prefer Not to Say
Red Meat Behavioural Measures

The next section of this study involves you answering questions about your behaviour related to the eating of red meat. Your answers are completely confidential. Please proceed.

1. Have you eaten red meat in the last week?
   Yes       No       Prefer not to say

2. If you have eaten red meat in the past week, out of the past 7 days, on how many days have you eaten meat? (if you have not eaten red meat, please write 0) ______

3. In the future, to what extent are you likely to follow a diet including red meat?

   1   –   2   –   3   –   4   –   5   –   6   –   7                                 X
   Not At All                  Definitely            Prefer Not To Say

4. Please indicate your gender:  Male   Female

5. Please write your age:_______

Marijuana Use Behavioural Measures

The next section of this study involves you answering questions about your behaviour related to marijuana use. Your answers are completely confidential. Please proceed.

1. Have you used marijuana in the last week?
   Yes       No       Prefer not to say

2. If you have used marijuana in the past week, out of the past 7 days, on how many days have you used it? (if you have not used marijuana, please write 0) ______

3. In the future, to what extent are you likely to use marijuana?

   1   –   2   –   3   –   4   –   5   –   6   –   7                                 X
   Not At All                  Definitely            Prefer Not To Say

4. Please indicate your gender:  Male   Female

5. Please write your age:_______
Contact Sports Behavioural Measures

The next section of this study involves you answering questions about your behaviour related to contact sports as a pastime. Your answers are completely confidential. Please proceed.

1. Have you played or watched contact sports in the last week?
   Yes    No    Prefer not to say

2. If you have played or watched contact sports in the past week, out of the past 7 days, on how many days have you? (if you have not played or watched contact sports, please write 0) ______

3. In the future, to what extent are you likely to play or watch contact sports?

   1   –   2   –   3   –   4   –   5   –   6   –   7               X
   Not At All                  Definitely                  Prefer Not To Say

4. Please indicate your gender: Male    Female

5. Please write your age:________
Appendix C

Table 4

*Experiment 1 Summary of Regression Analysis for Variables Predicting The Favourability of Correct Recall (N = 181).*

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$R^2 = .34$
Table 5

Experiment 1 Summary of Regression Analysis for Variables Predicting The Favorability of Correct Recognition (N = 186)

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R² = .54
Appendix D

EAT2

Information Sheet

This study is being conducted by a Graduate Student (Meghan Norris) under the supervision of Dr. Leandre R. Fabrigar, a Psychology Professor at Queen’s University in Kingston, Ontario.

In this study, you will be presented with information about the eating of red meat. You will then be asked to provide your opinion towards the topic and will be asked questions related to this topic. The first session of this study will take one hour. The second session will take 30 minutes.

You will receive 1.5% course credit for your participation in this study or $10 cash compensation.

Your participation in this study is voluntary and you are free to withdraw at any time without penalty. If you choose to withdraw, you may also ask that your data in not used in analysis. You may also choose not to answer any question that you find objectionable or that makes you feel uncomfortable. This study has no known physical or psychological risks.

Please be assured that the data will be kept in a secure location, that all of your responses will be coded to conceal your identity, and that your responses will be pooled with those of a larger number of individuals. Thus, individual results will not be available to you and your responses will remain confidential and anonymous; only authorized researchers will have access to the data. The data will be published in aggregate form only.

In the event that you have any questions, concerns, or complaints about this research, please feel free to contact Meghan Norris (meghan_e_norris@yahoo.ca), Dr. Leandre R. Fabrigar (fabrigar@post.queensu.ca), Dr. Vernon Quinsey (Head of the Queen’s Psychology Department, 533-2492), or the Queen’s University General Research Ethics Board, c/o Queen’s University Research Services (533-6081).

Please feel free to ask any questions now.

Thank you for your time. Your interest in participating in this research study is greatly appreciated.
EAT2
Consent Form

Name (please print clearly): _________________________________________________

1. I have read the information sheet and have had any questions answered to my satisfaction.

2. I understand that I will be participating in a study entitled EAT2 and that I will be presented with information regarding the eating of red meat and then will be asked questions regarding this topic which will take one hour during the first session and thirty minutes during the second session.

3. I understand that my participation in this study is voluntary and that I may choose not to answer any questions and to terminate my participation at any time. I understand that such withdrawal will have no adverse consequences.

4. I understand that I may choose not to answer any question that I find objectionable or that makes me feel uncomfortable.

5. I understand that the anonymity and confidentiality of my responses will be maintained now and in the future.

6. I understand that individual results will not be made available but I am entitled to a debriefing at the completion of the study in which the purpose and expected outcome will be made available to me.

7. If I have any questions concerns or complaints, I understand that I may contact Meghan Norris (meghan_e_norris@yahoo.ca), Dr. Leandre R. Fabrigar (fabrigar@post.queensu.ca), Dr. Vernon Quinsey (Head of the Queen’s Psychology Department, 533-2492), or the Queen’s University General Research Ethics Board, c/o Queen’s University Research Services (533-6081).

I have read the above statements and freely consent to participating in this research:

Signature: ________________________________ Date: __________________________
There has been a great deal of research conducted with respect to information processing and memory, however, research has been inconsistent with some studies suggesting that people remember attitude consistent information while others refute this finding. This study seeks to extend attitude-memory research by placing restrictions on participants that can be expected in daily situations. For example, some of you were placed in a situation where you completed a task that was consistent with your attitude. Others were in a situation where you completed a task that was inconsistent with your attitude. In addition, some of you were restricted in the amount of time you had to read the information. These restrictions will help to fill in the gaps within attitude-memory research by creating a need for bias in both information processing and memory.

In the event that you would like to see a counsellor about this deception regarding the presentation of inaccurate information, please contact Health, Counselling and Disabilities Services at 533-2506. They are located at 146 Stuart in the St. LaSalle Bldg, (across the street from Adelaide Hall). Also, please feel free to talk to the experimenter for more information on the information presented to you.

You should be aware that the information you read about was constructed by the experimenter for use in this study. Thus you should be aware that the information communicated to you is not necessarily accurate.

Regarding the topics of research addressed here, below is a list of some related references that might be of interest to you should you like to obtain further information on attitudes:


In the event that you have any questions, concerns, or complaints about this research, please feel free to contact Meghan MacDonald (meghan_e_macdonald@yahoo.ca), Dr. Leandre Fabrigar (533-6492), Dr. Vernon Quinsey (533-2492), Head of the Psychology Department, Queen’s University, or the Queen’s University General Research Ethics Board, c/o Queen’s University Research Services (533-6081). If you are interested in obtaining information about the results of the study once it is completed feel free to contact Dr. Leandre Fabrigar (533-6492).

This is an ongoing research project: PLEASE DO NOT DISCUSS THIS PROJECT WITH ANYONE, as knowledge about the procedure or our goals may alter the results we obtain from future participants. Thank you for your cooperation.

Finally, thank you for your participation in this project.

Meghan Norris
Appendix E

Experiment 2 Recall Instructions

Session 1 Time Restricted Attitude Expressive Recall Instructions

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Please be aware you will only have four minutes in which to complete the following task.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments supporting your opinion regarding the eating of red meat, and not necessarily arguments supporting the eating of red meat itself. In addition, the people you will be speaking to will generally agree with your opinion of eating red meat. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box.

You will only have FOUR MINUTES to complete this task. Please sit quietly when you have finished.

Session 1 Time Restricted Alternative Perspective Taking Recall Instructions

We have found it helpful for participants to collect their thoughts regarding the previously presented information in preparation for the upcoming speech.

Please be aware you will only have four minutes in which to complete the following task.

Keep in mind that in the next phase of this experiment you will be asked to provide arguments that do not support your opinion but that would support those who are in opposition to you in their opinions regarding the eating of red meat. In addition, the people you will be speaking to will generally disagree with your opinion of the eating of red meat, and we want you to generate arguments that will support these people. You will not be asked to justify any of these reasons, but simply to speak about them. In addition, your speech will be recorded on video, and shown to other participants for future studies.

Thus, at this point we would like you to recall what you can remember from the previously presented information in preparation. Only place one piece of information in each box.

You will only have FOUR MINUTES to complete this task. Please sit quietly when you have finished.
Session 1 Time Restricted No Goal Recall Instructions

We are interested in what you remember from the previously presented information. Thus at this point we would like you to recall what you can remember from the previously presented information. Only place one piece of information in each box.

You will only have FOUR MINUTES to complete this task. Please sit quietly when you have finished.

Session 2 Recall Instructions for All Participants

We are interested in what you remember regarding the topic of red meat based on what was presented to you during your last session. Thus at this point we would like you to recall what you can remember from the previously presented information. Only place one piece of information in each box. You will have 10 minutes to complete this task. Please sit quietly when you have finished.
Session 2 Opportunities to Engage in an Attitude-Relevant Activity

Queen's University makes many attempts to provide students with information on a variety of issues. This research project specifically looks at the eating of red meat. We are interested in providing you with information about upcoming Queen's events regarding this topic.

All classes and seminars being offered through this research project are delivered by nutritionists, qualified chefs or faculty who specialize in the given area.

Please indicate "yes" or "no" as to whether you are interested in receiving information about the events that you are about to be presented with (i.e. dates, times, and sign-up information). For those events you choose, we will provide you with the relevant information.

An evening seminar entitled "You Don't Need Red Meat to be Healthy." 
Y/N

A cooking class, "Keeping All-Veggie Options Interesting." 
Y/N

A seminar entitled "How to Eat Red Meat and Improve Health."
Y/N

A cooking class, "Low-Fat Cooking With Beef." 
Y/N

Volunteer with a student group which is working to reform the cafeteria's red-meat options so that they are more health conscious and appealing. This group is currently seeking volunteers.
Y/N

Volunteer to sign a petition to replace cafeteria red-meat options with healthier meal options such as fish, chicken, pork and meat-substitutes.
Y/N

A seminar entitled "How To Re-Introduce Red Meat into Your Diet." 
Y/N

Volunteer to sign a petition against the removal of many red meat items from the cafeteria menu.
Y/N
Session 2 Behavioural Measures

The next section of this study involves you answering questions about your behaviour related to the eating of red meat. Your answers are completely confidential. Please proceed.

1. Have you eaten red meat in the last week?  Y/N

2. If you have eaten red meat in the past week, out of the past 7 days, on how many days have you eaten meat? (if you have not eaten red meat, please write 0)

3. In the future, to what extent are you likely to follow a diet including red meat?

   1 – 2 – 3 – 4 – 5 – 6 – 7
   Not At All
   Definitely
   Prefer Not To Say

4. In the next 3 weeks, how likely are you to cook with red meat?

   1 – 2 – 3 – 4 – 5 – 6 – 7
   Not At All
   Definitely
   Prefer Not To Say

5. In the next 3 weeks, how likely are you to eat red meat in a restaurant?

   1 – 2 – 3 – 4 – 5 – 6 – 7
   Not At All
   Definitely
   Prefer Not To Say

6. Please indicate your gender:  Male   Female

7. Please write your age: ______
Appendix F

Table 6

Experiment 2, Session 1 Summary of Regression Analysis for Variables Predicting The Favourability of Correct Recall (N = 110)

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$R^2 = .20$
Table 7

*Experiment 2, Session 1 Summary of Regression Analysis for Variables Predicting The Favourability of Correct Recognition (N =115)*

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$R^2 = .10$
Table 9

*Experiment 2, Session 2 Summary of Regression Analysis for Variables Predicting The Favorability of Correct Recognition (N = 93)*

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$R^2 = .06$