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The effects of misleading information and group discussion on eyewitness testimony

Matthew A. Cook
Wilfrid Laurier University

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The Effects of Misleading Information and Group

Discussion on Eyewitness Testimony

by

Matthew A. Cook

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Abstract

The purpose of the present studies was to assess the separate and interactive effects of misinformation and group discussion on eyewitness testimony. In Experiments 1 and 2, participants viewed a short video of a simulated robbery and shooting, and were then presented with either neutral or misleading information that was embedded in forced-choice questionnaires in a recognition test. Participants were subsequently randomly assigned to a group-recognition or individual-recognition condition. Groups were instructed to answer questions about details of the video (in Experiment 1 they were instructed to try to reach consensus), while individuals completed the recognition task on their own. Finally, all participants again completed a recognition test, and an open-ended recall test concerning the details of the video. A misinformation effect was found for both studies. However, the prediction that misled groups would report more of the misleading items than misled individuals was not supported. Groups, however, correctly recognized more of the neutral items than did individuals. Experiment 2, which investigated the effects of misinformation on misleading items with differing base rates (i.e., the number of participants who endorse the misleading information prior to group discussion), found that there was a reduction in the number of misleading items that were reported from the first to the third recognition test, even for those items that a majority of participants initially endorsed. Implications of the group recall superiority and repeated testing effects for mock witness recall are discussed.

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The Effects of Misleading Information and Group

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Imagine a situation in which you witnessed a crime along with a number of other

people. Now imagine that you and the other witnesses discussed the details and events of

the crime before the police arrived to obtain your account of the crime. In a situation

such as this what would happen to your memory for the crime? Would your memory be

composed solely of your own recollections, or would your memory also include aspects

of the memory reports of the other eyewitnesses? In other words, how much are

eyewitnesses' memories influenced by discussion with other eyewitnesses? To what

extent are witnesses' memory gaps or uncertainties filled in by the reports of others (be

they accurate or inaccurate), or by post-event misinformation (which suggests, for

example, the existence of an object not present in the original event)? This research

investigates the influence of exposure to misinformation and of group discussion on

subsequent eyewitness memory and testimony.

The Misinformation Effect

The misinformation effect, which occurs when people incorporate misleading

information read (or heard) after witnessing an event into their subsequent recall or

recognition of an event, is a well-established finding in the eyewitness and cognitive

psychology literature (e.g., Christiaansen & Ochalek, 1983; Greene, Flynn, & Loftus,

1982; Lindsay & Johnson, 1989; Loftus, 1975; Zaragoza & Mitchell; 1996).

The general paradigm that has been used to demonstrate the misinformation effect

involves participants watching a video or a sequence of slides and subsequently receiving

misleading information about the details and events. Typically, the misinformation is

embedded in a narrative description of the event or in questions concerning details of the event. The extent to which the misinformation is subsequently reported by the witness is assessed via the use of either a recognition or recall test.

In an early demonstration of the misinformation effect, Loftus, Miller, and Burns (1978) found that participants were more likely to report seeing a "yield" sign after being provided with this misleading information than if they had been provided with the correct information (i.e., a stop sign). The findings of this influential study point to the influence of presentation of incorrect information on witnesses' subsequent recall of an event.

Among other researchers, Loftus et al. (1978) have shown that the misinformation effect can be obtained when participants view a video or slide sequence that depicts an automobile accident. However, research has also revealed the misinformation effect with slides that do not depict an accident or crime (e.g., Braun & Loftus, 1998; Loftus, 1977). Loftus (1977) presented participants with a slide sequence that depicted a green car driving past an accident. Half of the participants were presented with information that described the car as being blue, while the other half did not receive any information about the colour of the car. The results indicated that participants who received misleading information chose a 'bluer' colour on a colour wheel than participants who received neutral information. Loftus thus concluded that memory for a detail or event consists of a blend between prior knowledge and post-event information. That is, memory consists of more than simply what a person actually witnessed.

In a study that revealed that the misinformation effect could be produced even when strategic memory aids are utilized, Echlin and Cockerton (1996) instructed participants to use mnemonics to aid in recall. Participants in this study were instructed

to use the individual mnemonics of the Cognitive Interview (e.g., reporting everything, even partial information, regardless of its perceived importance, and reporting the events from a variety of perspectives; Geiselman et al., 1984) to aid in recall of a short film clip. Results indicated that the mnemonics aided in recall of correct information provided after the event, however a significant misinformation effect was also present such that participants who were presented with misleading post-event information recalled more of these items than they did the originally viewed correct items. It is apparent that the misleading information has such a profound impact upon one's memory that even the use of specific memory aids is not enough to prevent this misinformation from being incorporated into one's subsequent recall.

The misinformation effect is a reliable finding in the cognitive psychology and eyewitness literature, and the present studies were designed to replicate and extend these findings. For instance, unlike much previous research our recognition tests did not utilize only peripheral details, but also misleading details that are more central to the event, in order to determine the impact of misinformation on items which most participants will have accurate initial memories. The manner in which participants are exposed to misleading information will now be discussed.

Narrative versus a Questionnaire

Many of the studies that have been conducted involving the misinformation effect have utilized a narrative (a written description of the event) to introduce the misleading information. However, some studies have utilized a questionnaire (e.g., Cook & Gwynn, 2000; Higham, 1998; Loftus, 1975; Shaughnessy & Mand, 1982; Zaragoza & Lane, 1994; Zaragoza & Mitchell; 1996) and produced an equivalent, if not stronger, effect. In

these studies the misinformation is incorporated into forced-choice questions about the

video or slide sequence to which participants respond before completing the final

memory test (e.g., The question "In which ear(s) was the offender wearing the gold

earring?" is asked, when in actuality the offender was not wearing an earring).

Zaragoza and her colleagues (Zaragoza & Lane, 1994; Zaragoza & Mitchell,

1996) conducted studies in which they used a questionnaire to introduce the misleading

information to the participants. In one set of studies (Zaragoza & Lane, 1994) the

researchers hypothesized that more source misattributions (misidentifications of the

source of a particular detail) would occur when participants receive misleading

information via a questionnaire rather than via a narrative. That is, participants would

incorrectly report remembering a detail as being from a video when they had actually

read about it in a narrative or questionnaire, or vice versa. The results demonstrated the

misinformation effect, but more importantly they supported the researchers' hypothesis

that the misinformation effect was more pronounced when participants received the

misinformation in a questionnaire rather than in a narrative paragraph. Thus, participants

sometimes come to believe that they remember seeing items that were merely suggested

to them during questioning about the event.

In a second set of studies, Zaragoza and Mitchell (1996) investigated the effects

of repetition of the misinformation. Specifically, the researchers postulated that

repetition of correct and misinformation items would increase the likelihood that

participants would report that the misleading event had been viewed in the original event

(i.e., an increase in the recall of the misleading items). The results from these two studies

indicated that the repetition led to increased recall performance for the original (correct,

non-misled) items, but also led to an increase in false memory for the suggested items,

thus demonstrating a strengthened misinformation effect.

A recent study by Cook and Gwynn (2000) revealed that the mere mention of

incorrect peer reports (i.e., participants were given bogus information about the responses

that their peers had given in a similar study) is enough to produce the misinformation

effect. Cook and Gwynn showed participants a video depicting a simulated robbery and

shooting. As in the aforementioned studies, participants subsequently completed a

questionnaire in which some questions contained embedded misleading information. The

results from this study, which included both recognition and recall tests, indicated that

participants who received misleading information (in both the questionnaire and the peer

reports) were significantly more likely to report this misinformation than the originally

viewed information. That is, the misinformation effect was again displayed. Participants

who did not receive any misinformation or any information about peer reports were not

likely to incorrectly report the misinformation items.

Therefore, Cook and Gwynn (2000) concluded that participants' responses were

strongly influenced by peer reports, as evidenced by the fact that participants often

responded in the same direction as their "peers". Accordingly, it appears that in order to

influence someone you may just have to tell him/her that his/her peers are responding in a

prescribed manner.

The present studies involved a questionnaire that introduced the misleading

information, rather than a narrative, since there is a higher rate of misinformation

reporting for questionnaires. It is thought that a questionnaire forces participants to

actively retrieve stored information, and that in the process of retrieval participants are

likely to make more errors than simply by having to read a narrative, which is more

passive. As Zaragoza and Mitchell (1996) found an increased belief in false information

with repetition, multiple questionnaires were completed so as to further strengthen the

misinformation effect

Central versus Peripheral Details

Each of the studies cited above have involved inducing the misinformation effect

for peripheral details. It has been shown that participants can easily be misled about

details that are not central, or very important, to a video or slide sequence.

Participants may be easily misled about peripheral details because these details

are less likely to be attended to originally and thus never encoded during initial viewing

of the slide sequence (Kebbell & Wagstaff, 1999). Central details, on the other hand,

would be more salient (and more likely to be encoded), and hence more memorable

because of their importance to the event. The misinformation effect has not been found

to be as strong when researchers attempted to mislead participants about central details

(e.g., Belli, Windschitl, McCarthy, & Winfrey, 1992; Cook & Gwynn, 2000; Wright &

Stroud, 1998). In two experiments, Belli et al. (1992; Experiments 1 and 4) had

participants receive misleading information shortly after viewing a slide sequence. That

is, there was a short retention interval between the original viewing of the slides and

presentation of the misinformation. The results from both studies indicated that accuracy

was equal for both original and misleading items; that is, there was no misinformation

effect as participants did not report the misleading items, but rather correctly reported the

event items that occurred in the slides. Based on these findings Belli et al. posited that

central, or very important, items are encoded to a higher degree than peripheral details.

Accordingly, participants display an excellent memory for central details, rendering these items less susceptible to the misinformation effect.

There are circumstances, however, when the misinformation effect can be produced even with central items, such as with the use of a long retention interval (e.g., Belli et al., 1992; Experiments 2 and 3). It is postulated that a misinformation effect could then be evident because a long delay between presentation and reception of the misleading information causes participants to forget details of the event; the subsequent reliance on post-event information is simply a consequence of the limitations of human perception and memory (Hall, Tousignant, & Loftus, 1984).

Based on this large body of research it is clear that the misinformation effect occurs reliably, especially for peripheral items. Since past studies have used either clearly peripheral (i.e., details that most participants incorrectly endorse) or clearly central (i.e., details that few participants incorrectly endorse) items, we decided to use, in the present studies, items that were neither peripheral nor central to the event. In the first study misleading items were selected for which the misinformation was chosen by approximately 50% of participants on a pilot test in order to sensitize the differences between groups and individuals, and to eliminate possible floor or ceiling effects.

Contradictory Findings using Recall Tests

While studies employing standard recognition tests (i.e., a forced-choice test involving the original and misleading information) have consistently provided evidence for the misinformation effect (e.g., Cook & Gwynn, 2000; Loftus, Miller, & Burns, 1978; McCloskey & Zaragoza, 1985; Zaragoza & Koshmidir, 1989), the same cannot be said for studies which utilized recall tests. Such studies have provided inconsistent findings

(e.g., Belli, Lindsay, Gales, & McCarthy, 1994; Zaragoza, McCloskey, & Jamis, 1987)

such that the misinformation effect is evident when participants are instructed to recall

any details that they can remember, but is not evident when participants answer fill-in-

the-blank type questions.

In a study utilizing a recall test, Zaragoza et al. (1987) argued against Loftus'

(1975) hypothesis that misleading post-event information affects the original information,

and postulated instead that the misinformation neither erases the original information, nor

renders it inaccessible. The recall test in Zaragoza et al.'s study consisted of questions

which were constructed such that the misleading information was not an appropriate

response (e.g., if participants viewed a coffee maker on a counter and were misled to

believe that they saw a Coke can, then the recall question was: "What type of appliance

was on the counter?"). In contrast to the use of standard recognition tests, there was

found to be no difference in accuracy for misleading versus non-misleading items. That

is, these results appear to demonstrate that misleading information does not affect

participants' ability to recall the original information, and thus argues against Loftus'

(1975) original memory impairment hypothesis. Zaragoza et al. postulated that the

misinformation effect is due to response biases, such as reporting only the misleading

information because, for reasons unrelated to the presentation of this misinformation,

they have forgotten the correct information. And, when response biases are eliminated,

Zaragoza et al. contend that the misinformation effect is also eliminated.

Based on the findings from Lindsay (1990) and Belli et al. (1994) it appears that

certain types of recall tests (i.e., write down everything you can remember about the

critical events) produce the misinformation effect while others (i.e., fill-in-the-blank type

questions that preclude the misleading item as a possible response) do not. It is with this

in mind that we designed a directed open-ended recall test. Our recall test asked

participants to write down everything they could remember about certain descriptions or

events (i.e., involving the misleading details). This recall test was used to extend the

findings of Lindsay and Zaragoza et al. That is, does a recall test produce the

misinformation effect?

Confidence-Accuracy Relationship

Most people, including triers-of-fact such as judges, lawyers, and juries, believe

that there is a relationship between confidence and accuracy with regards to eyewitness

testimony (e.g., Cutler, Penrod, & Stuve, 1988; Lindsay, Wells, & Rumpel, 1981; Wells,

Lindsay, & Ferguson, 1979). That is, people tend to believe that a witness who appears

to be confident is more likely to be accurate than a less confident witness. However, the

results of many empirical studies indicate that a participant's reported confidence in

his/her recall is not indicative of the correctness of the recall (e.g., Cook & Gwynn, 2000;

Loftus, Donders, Hoffman, & Schooler, 1989; Tousignant, Hall, & Loftus, 1986).

Tversky and Tuchin (1989) designed an experiment to assess participants'

memory and confidence for original, misleading, or novel items. A "yes/no" test was

utilized instead of the standard recognition tests, and participants' confidence levels were

measured. When participants received misleading information they were more confident

when they incorrectly rejected the original item and when they incorrectly accepted the

misleading item than when they answered correctly in these cases.

These studies have even shown that participants may sometimes be more

confident in an incorrect answer than a correct answer. The current studies also assessed

the relationship between witnesses' recall accuracy and confidence in an attempt to

replicate and extend the above findings.

Social Psychological Influences in Eyewitness Recall

As is evident from the literature reviewed, the misinformation effect is a factor

that has consistently been shown to influence eyewitness memory when a recognition test

is utilized. Much of the research has focussed on topics such as forms of the presented

misinformation and recall tasks, memory for source, and retention intervals, that is, a

focus on cognitive factors potentially influencing the misinformation effect. Less

commonly studied are social psychological factors, such as group discussion and co-

witness influence, which may impact eyewitness memory. The results from the studies

that have involved these social factors have been inconsistent. Some suggest that group

discussion improves memory accuracy whereas others suggest it hinders accuracy.

Evidence for Group-Recall Superiority

Studies concerning the effects of group discussion on eyewitness testimony

conducted by Stephenson and his colleagues (e.g., Clark, Stephenson, & Kniveton, 1990;

Stephenson, Brandstaetter, & Wagner, 1983; Stephenson, Clark, & Kniveton, 1989;

Stephenson, Clark, & Wade, 1986; Stephenson & Wagner, 1989) have found that group

recall is superior to individual recall.

Stephenson et al. (1986) noted that there was little research concerning the effects

of collaborative recall on testimony. Consequently, participants in their study were

divided into individual, two-person, or four-person conditions after listening to an

audiotape recording of a woman who was allegedly raped. Participants completed two

memory tasks, with the groups instructed to discuss the recording and to reach consensus

about their answers. Results indicated that groups gave more complete, more accurate,

and more consistent answers than participants in the individual condition. Accordingly, it

appears that collaborative evidence (i.e., answers that are agreed upon by group

members) is more accurate and complete than individual evidence.

Clark et al. (1990) were also interested in determining if groups or individuals

would provide more accurate recall. The researchers had police constables and students

view an interrogation of a woman who claimed that she was raped. Participants were

then divided into an individual, dyadic, or four-person condition, and completed free-

recall and cued-recall tests. Again, the groups were instructed to reach consensus. The

results demonstrated that groups were more accurate than individuals on both types of

recall tests. That is, discussion and collaboration amongst group members ("social

remembering") appears to increase the accuracy of reports.

In line with previous research, Yarmey and Morris (1998) attempted to determine

if group recall and recognition of eyewitness reports was more accurate than individual

recall and recognition. The researchers utilized four different experimental groups for

their study. The collaborative dyad group discussed the crime and reached a consensus

about the culprit's characteristics; the crime-discussion dyad discussed the incident and

shared descriptions about the culprit; the neutral-discussion dyad discussed neutral topics

that were unrelated to the videotaped robbery; and the no-discussion group privately

thought about the incident and culprit. The results indicated that the two crime-

discussion groups recalled significantly more accurate information from the video than

did the other two groups. Further, the collaborative dyad was significantly better than the

other three groups in their rejection of the target-absent lineup. Therefore, it appears that

collaborative efforts and joint responses can improve eyewitness recall and minimize false identifications.

Taken together, there is evidence that group discussion and recall is superior to individual recall for crime-related events. However, it should be noted that in each of the studies, groups tended to be overly confident of their incorrect responses. That is, groups were more prone than individuals to have a misplaced overconfidence in mistaken recall.

Evidence against Group-Recall Superiority

Some research, however, has not found a superiority of collaborative versus individual recall for eyewitness testimony (e.g., Alper, Buckhout, Chern, Harwood, & Slomovits, 1976; Hollin & Clifford, 1983; Underwood & Milton, 1993). That is, these studies have found no significant difference between individual recall and group recall.

Prior to 1980, most studies interested in the effects of group discussion on eyewitness testimony were concerned with recall tasks. However, Warnick and Sanders (1980) included a recognition task in their study. They utilized two group-recall conditions and one individual-recall condition for their study. In one group condition (group-individual), participants discussed the video and then privately responded to the questionnaire. In the other group condition (group-consensus), participants were asked to reach a group consensus about their responses to the questions. Participants in the individual condition completed the questionnaire without discussion. The results indicated that there were no reliable differences between the conditions with respect to accuracy of the identification of the culprit (i.e., a recognition test). Warnick and Sanders concluded that confident individuals in groups may have tried unsuccessfully to greatly

persuade less confident individuals as this would have led to a reliable difference

between groups and individuals.

Underwood and Milton (1993) also attempted to determine if independent reports

given by eyewitnesses were as accurate as group reports. They had participants view a

video of a car accident either as a member of a group, with whom they could discuss the

incident, or as an individual. Participants subsequently completed the recall tests

individually. The results displayed no overall significant differences on recall accuracy

between groups and individuals. The opportunity for discussion had no effect as

individual witnesses were as accurate as group witnesses.

For each of the studies which investigated group discussion effects on eyewitness

testimony, groups were either equally accurate (e.g., Underwood & Milton, 1993;

Warnick & Sanders, 1980; Yarmey, 1992) or more accurate (e.g., Clark et al., 1990;

Stephenson et al., 1983; Stephenson & Wagner, 1989) than individuals. In other words,

in no instance did groups provide less accurate recall than individuals. What might

account for the (sometimes) superiority of groups over individuals? Perhaps social

influence is impacting witnesses' recall.

Hollin and Clifford (1983) argued that a person cannot be involved in a group

discussion without being socially influenced by his/her peers. Hollin and Clifford found

that following group discussion participants changed their original responses and

subsequently agreed with the confederates' erroneous answers. These researchers

postulated that only "difficult" items are susceptible to these discussion effects. Research

involving the effects of social influence on individual attitudes, perceptions, and reports

will now be considered as group discussion, and perhaps even social influence are an

integral part of the present studies.

Social Influence and Conformity

The results of most conformity research indicate that conformity is high when a

participant believes that there is unanimity within a group (e.g., Asch, 1951, Baron,

Vandello, & Brunsman; 1996). That is, the likelihood of a participant conforming to a

group increases if the participant believes that the group is unanimous prior to his/her

decision. .

Most research on memory has failed to investigate group influences on recall.

Asch (1951, 1956) provided landmark research involving conformity to group norms. In

these studies, participants were asked to respond to some simple judgement tasks: which

of three comparison lines was equal in length to a standard line. Asch had confederates

respond with incorrect answers on pre-determined trials prior to participants providing

their answer. The results indicated that 75% of participants conformed to the group at

least once when there was group unanimity (i.e., all confederates provided the same

incorrect answer), but that conformity was reduced when there was at least one

disagreeing accomplice. These results demonstrate how participants are influenced by

exposure to the responses of their peers, especially when there is perceived group

unanimity. Perhaps participants feel pressured to conform, or they may come to doubt

their own judgements, and thus they conform to the group due to their own uncertainty.

Minority Influence and Private Acceptance versus Public Conformity

The research cited above describes situations in which individuals may yield or

conform to the real or perceived majority of their peers. However, in many group

situations there may be a majority opinion or attitude that is confronted by a minority opinion or attitude. Conformity is thought to be a function of dependence and power (e.g., Jones & Gerard, 1967; Latane & Wolf, 1981). Due to its size, the majority is the more powerful agent of social influence, particularly where the minority is dependent upon the majority for information, social acceptance, or approval.

In some circumstances, however, minority views or opinions may prevail. Minority influence is believed to be a function of the minority's behavioural style (Moscovici, 1976). If an initially powerless minority consistently supports an alternative position they may induce conflict with the majority. This consistency may induce the majority to believe that the minority is certain and confident. It thus appears that social change by the majority or the minority produces two qualitatively different effects, as argued by Moscovici (1980). A majority opinion tends to result in public compliance, in the absence of private acceptance or internalization. In contrast, private acceptance may be induced by a consistent minority even when no public compliance occurs.

Maass and Clark (1983) realized that very few studies have exposed participants simultaneously to a majority and a minority influence. Accordingly, these researchers conducted a study which involved exposure to both majority and minority opinions favouring gay rights. In one condition participants subsequently provided public declaration of their responses, while those in the other condition declared their responses only privately. As the researchers predicted, participants moved towards the majority in public declarations, but towards the minority in private declarations. Maass and Clark therefore argued that private acceptance does not hinge upon a prior public compliance to the minority influence. As well, majority and minority influence appear to operate under

two distinct qualitative processes. It appears as though participants will publicly agree

with a majority, however when given the opportunity to respond privately they tend to

agree with the minority. Perhaps when in public people are afraid of being socially

rejected by the dominating size and power of the majority. However, people feel free to

privately express their true feelings, attitudes, and opinions without the fear of being

rejected by the majority.

Such may be the case when, as in the present studies, participants must provide

public responses, and rather than go against the expressed or believed majority view,

these participants may comply or yield to (perhaps incorrect) majority opinion. They are

able, however, to subsequently provide the correct private responses. Thus, participants

may publicly agree with an incorrect majority when in group discussion, but then may

revert to their original (correct, minority) answers when giving subsequent private

responses.

Group Polarization

Many studies have shown that group discussion tends to shift participants'

answers further in the socially preferred direction, that is, a group polarization effect

occurs in a number of different contexts (e.g., Myers, 1978; Myers & Arenson, 1972;

Myers & Bishop, 1971; Myers & Kaplan, 1976; Myers & Lamm, 1975; Myers, Wojcicki,

& Aardema, 1977). Typically in these studies participants are given a risky-choice and

cautious-choice dilemma and then individually give a rating concerning which choice

they believe the person in the dilemma should select. Subsequently, participants discuss

their answers and provide a group rating. The results consistently demonstrate that an

initially risky-choice becomes even riskier, and an initially cautious-choice becomes even more cautious.

Two explanations have been offered for this group polarization effect. Levinger and Schneider (1969) postulated that individuals' responses are a compromise between their ideal preference, which is often toward an extreme, and the group norm, which they assume to be more moderate. When given the opportunity to compare their answers to the group, individuals realize that the group norm is closer to their own attitudes than they had imagined, which allows them to subsequently respond closer to their ideal preferences.

Another explanation (Pruitt, 1971a, 1971b) posits that the polarization effect is attributable to the observation of a group member who has the same attitude in a relatively extreme form, and not discovery of the group average. This ally then permits individuals the opportunity to be released from group norms, which enables them to act out their private inclinations. This finding is similar to Asch's (1956) finding that conformity to a group decreased when participants realized that there was at least one other person who did not conform to the group. This ally allowed participants to respond with what they thought was the correct answer, rather than feeling pressured to give the same answer as the group.

The Present Studies

Taken together, the results of the studies reviewed above indicate that memory for details of an event may be strongly influenced by the information that is presented to participants between the viewing of an event and subsequent reports concerning the event (i.e., post-event misinformation) and may also be influenced by social psychological

factors, such as social influence and compliance to majority opinions in group

discussions. The present studies investigated the separate and interactive effects of post-

event misleading information and group discussion on eyewitness memory. It was

expected that the misinformation effect (i.e., participants including misinformation details

in subsequent recall) would be replicated in both studies. Further, based on the findings

of the positive effects of collaborative efforts on eyewitness testimony (e.g., Stephenson

et al., 1986) it was predicted that non-misled groups would provide more accurate recall

for neutral (non-misleading) information than would non-misled individuals. As well,

based on the findings from Stephenson et al. it was predicted that misled groups would

provide more of the misleading items on the recognition test than would individuals.

Stephenson et al.'s groups had access to more information about the details of the

audiotape than any one individual could have, and thus identified more correct

information than individuals. This same process was expected to occur for our

misleading items. Groups would have access to more incorrect information than any one

individual would have, thus leading to groups reporting more misinformation items. It

was thought that individual group members would incorrectly recall, and bring up in

group discussion, some of the misleading details, several of which the group as a whole

would adopt in their 'consensus' responses. These incorrect responses may subsequently

be provided by individual group members in their own post-group discussion recognition.

Experiment 1

Method

Participants. The present study involved 240 students (each of the eight treatment

conditions had an equal number of participants, i.e., 60 in the individual condition, 30

groups of two, 20 groups of three, and 12 groups of five) who were enrolled in the

Introductory Psychology participant pool at Wilfrid Laurier University. All participants

were tested in groups of 20-24, and received one course credit for their involvement.

Design. This study involved a 2 (misinformation: misled/not misled) X 4 (group

size: individual , or groups of 2, 3, or 5) X 2 (number of recognition tests completed

individually by each participant) mixed Analysis of Variance (ANOVA) design. The

participants received either misleading or non-misleading information in a post-event

questionnaire concerning a mock crime video. Within each of these conditions

(misled/non-misled), participants completed three recognition tests: one prior to group

discussion, the group discussion test (or in the case of individuals another individual test),

and one post-group test.

The major dependent variables included the number of misinformation items

reported during three recognition tests and one recall test, and accuracy (i.e., the number

of neutral items, those not involving misinformation, correctly identified) on neutral

forced-choice items.

Procedure. Participants signed up on the Research Participation Board for a single

session study entitled "An investigation into eyewitness testimony". Participants were

asked to read and sign the Informed Consent (see Appendix A) upon arrival for the

experimental session. All participants first viewed a two-minute video of a simulated

robbery and shooting, and then received their experimental booklet containing the tasks

to be completed for the study. Each booklet contained a unique "participant number" in

order to connect individuals' pre-group and post-group recognition tests.

After viewing the video, participants completed the Marlowe-Crowne Social

Desirability Scale (Crowne & Marlowe, 1960; see Appendix B). Participants were given

approximately three and a half minutes to complete this scale, which acted primarily as a

filler task between stimulus viewing and recall.

Participants then received a 20-item forced-choice recognition questionnaire (with

confidence level measurement) concerning details of the video. Half of the participants

received a questionnaire containing misleading information embedded in five of the

questions (see Appendix C, indicated by ***), while the other half received non-

misleading information embedded in these five questions (see Appendix D, indicated by

***). The misleading questions involved details that were neither very central nor overly

peripheral to the events of the video. These questions and misinformation items were

selected based on the criteria that approximately 50% of the participants in a pilot study

answered them correctly. These items were chosen because the majority of studies that

involve the misinformation effect utilize peripheral details, which are difficult to initially

attend to during viewing and hence may not be stored in one's memory, thus making the

misinformation effect easier to obtain. However, central items, unless used with a long

retention interval, do not produce the misinformation effect. Therefore, these "50%"

types of items add to the misinformation effect literature as approximately one-half of

participants were expected to be correct on the questions concerning the misleading

details. Participants were given approximately four minutes to complete this first

recognition questionnaire.

Participants subsequently completed a 10-item forced-choice recognition

questionnaire (with confidence levels[1]) which again involved details of the video (see

Appendix E). This questionnaire contained questions involving the five misleading items

(with the misinformation and the correct answer as possible responses), and five new

neutral questions. This questionnaire was utilized in order to gather initial endorsement

rates (i.e., the number of misleading items reported by each participant) before entering

into group discussion.

Participants then completed the second filler task, Snyder's (1974) Self-

Monitoring Scale (see Appendix F), which took approximately three minutes.

Upon completion of the self-monitoring scale, participants assigned to three

conditions were told that they would be placed into groups of two, three, or five, and that

their task was to collaborate on a forced-choice recognition test (see Appendix G; a slight

modification from the first recognition test in that participants in the misled condition

now had the opportunity to select the correct answer). Each group (which consisted of

either all misled or all non-misled participants) was told that it was very important that

they try to reach a group consensus for each item of the test. If groups were unable to

reach a consensus then they were asked to indicate the answers of each participant,

including each participant's identification number, in order to keep track of individuals'

responses (however, this never occurred as all groups reached a consensus on every

item). Each group completed their test in a separate room. All participants in the

individual condition completed the same recognition test (Appendix G) as participants in

the group condition, followed by the completion of a famous names filler task (see

Appendix H). This extra filler task was needed in order to equate the times taken for

individuals compared to the groups. Participants in the group condition were given

approximately 15 minutes to complete the recognition test, whereas participants in the

individual condition were given the same amount of time to complete the recognition test

and filler task. Participants in groups returned to the original testing room upon

completion of the recognition test.

A final forced-choice recognition test, which was the same as the group

discussion test (see Appendix I), and which all participants completed individually, was

then administered[2]. Participants received approximately four minutes to complete this

task.

Participants then completed a directed open-ended recall test (see Appendix J) in

which they were instructed to write down as much information as they could remember

about specific events (e.g., the offender's jewelry). Participants were given five minutes

to complete this task.

Participants were then given two minutes to describe their beliefs about the

purposes of the study (see Appendix K), in order to determine if any participants were

aware that they had been presented with misinformation concerning the video[3]. Finally,

participants were asked about the extent to which they felt they had been influenced to

provide answers which they believed to be incorrect while in the group (see Appendix L).

Participants were then provided with a verbal summary of the study, given an

"Information about the study" sheet (see Appendix M), and any questions or concerns

that they had about the research were addressed.

Results

Misinformation Reports on Pre-Group Recognition Test. Separate chi-square tests

of independence were conducted to determine if misled participants (i.e., those who

initially received misleading information) selected each misleading item proportionately

more often than did non-misled participants (i.e., those who initially received neutral

information) on the pre-group recognition test. The results indicated that the

misinformation effect was evident for three of the five misleading items: (gold watch: X^2

(1, $\underline{N}$ = 239) = 33.20, $\underline{p}$ < .001; gold earring: X^2 (1, $\underline{N}$ = 239) = 16.88, $\underline{p}$ < .001; use of the

word 'empty': X^2 (1, $\underline{N}$ = 240) = 2.56, $\underline{p}$ = .11; that money was stolen: X^2 (1, $\underline{N}$ = 239) =

17.78, $\underline{p}$ < .001; and the use of the word 'move': X^2 (1, $\underline{N}$ = 239) = 2.12, $\underline{p}$ = .15).

Interestingly, those items that involve wording were not reported more often by

misinformed participants.

In order to determine the extent of the misinformation effect on the pre-group

recognition test, an independent samples t-test was conducted. The results indicated that

misled participants reported more of the misleading items ($\underline{M}$ = 2.43, $\underline{SD}$ = 1.27) than did

non-misled participants ($\underline{M}$ = 1.39, $\underline{SD}$ = 0.88), $\underline{t}$ (234) = 7.33, $\underline{p}$ < .001.

Group Size Manipulation. To assess the impact of group discussion on individual

recognition for the misinformation items, a 2 (misinformation: misled/not misled) X 4

(group size: 1, 2, 3, 5) X 2 (test: pre-group/post-group) mixed ANOVA was conducted on

the pre-group and post-group individual tests. Significant main effects were found for the

between-subjects factor of misinformation and group size, however these were qualified

by a misinformation X group size interaction, $\underline{F}$ (3, 228) = 2.75, $\underline{p}$ < .05 (see Figure 1).

Collapsed across test, individual misled participants reported more misinformation items

than did participants who took part in groups, while there were no differences amongst

non-misled participants. There was also found to be a significant main effect of the

within-subjects factor of test. Participants reported more misleading items on the pre-

group recognition test ($\underline{M}$ = 1.91, $\underline{SD}$ = 1.21) than on the post-group recognition test ($\underline{M}$ =

1.77, $\underline{SD}$ = 1.20), $\underline{F}$ (1, 228) = 4.65, $\underline{p}$ < .05 (see Figure 2). These results indicate that

while the misinformation effect was evident, fewer misinformation items were reported

after group discussion than before. The interactions involving the test variable failed to

reach significance.

While our misinformation X group size X test interaction failed to reach

significance, in order to test our a priori hypothesis that group discussion would result in

more misleading items being reported following this discussion we examined the group

size X test means for misled participants (see Figure 3). Participants in the individual

condition reported more misleading items on both the pre-group and post-group tests.

However, participants in groups of three and five displayed a larger reduction than

participants in the individual condition or in groups of two.

To determine the impact of group discussion on individual recognition for the

misleading items, a 2 (misinformation) X 2 (groups: individuals versus groups of two,

three, and five combined) X 2 (test) mixed ANOVA was conducted on the pre-group and

post-group tests. While the within-subject factor of test approached significance, there

was a significant misinformation X groups interaction, $\underline{F}$ (1, 232) = 8.31, $\underline{p}$ < .01 (see

Figure 4). Collapsed across test, individual misled participants reported more misleading

items than participants who took part in groups, while there were no differences amongst

non-misled participants.

Again the three-way interaction did not reach significance, however we examined

the means to test our a priori hypothesis that misled participants in groups would report

more misleading items following group discussion than would misled individuals (see

Figure 5). Misled individuals reported more misleading items on both the pre and post

group tests, however participants in misled groups demonstrated a slightly greater

reduction in the reporting of these items across tests.

To assess whether groups reported more misleading items than individuals, a 2

(misinformation) X 4 (group size) between-groups factorial ANOVA was conducted on

the group recognition test, with group as the unit of analysis. Again, there was a

significant main effect of the misinformation factor, F (1, 114) = 7.66, $p < .01$. Misled

participants (M = 2.31, SD = 1.36) reported more of the misleading items than did the

non-misled participants (M = 1.34, SD = 0.94). Therefore, the misinformation effect was

evident on the group test. Neither the main effect of group size nor the interaction

reached significance.

Recognition of Neutral Items. To assess the impact of group discussion on

subsequent individual recognition for the neutral items, a 2 (misinformation) X 4 (group

size) X 2 (test) mixed ANOVA was conducted on the pre-group and post-group tests.

The results indicated that there was a significant main effect of test, however this was

qualified by a significant group size X test interaction, F (3, 232) = 16.93, $p < .001$ (see

Figure 6). Simple main effects analyses revealed that there were no pre-group

differences in the recognition of neutral items, and no increase across tests for

participants in the individual condition. However, participants who had discussed the

event in groups of two, three, or five showed increases in correct neutral item recognition

from pre-group to post-group testing. As well, there was a significant misinformation X

group size interaction, F (3, 232) = 3.04, $p < .05$ (see Figure 7). In this interaction,

individuals and groups of two and three were slightly more accurate when they were not

misled, whereas the reverse was true for groups of five. However, since these items did

not contain any misinformation the relevance of this interaction (involving neutral items)

is questionable.

To determine the impact of group discussion on subsequent individual recognition

for the neutral items, a 2 (misinformation) X 2 (groups) X 2 (test) mixed ANOVA was

conducted on the pre-group and post-group tests. There were significant main effects of

groups and test, however these were qualified by a groups X test interaction, $\underline{F}$ (1, 236) =

31.28, $\underline{p}$ < .001 (see Figure 8). Simple main effects revealed that there were no initial

differences in the number of neutral items reported. Participants in groups showed a

significant increase from pre-group to post-group tests, while those who were not in

groups did not show this increase. At the post-group test, participants who took part in

groups reported more correct neutral items than did participants who completed all tests

individually.

To assess whether groups reported more correct neutral items than individuals, a 2

(misinformation) X 4 (group size) between-groups factorial ANOVA was conducted for

the group recognition test. A significant main effect of group size was found, $\underline{F}$ (3, 114)

= 6.49, $\underline{p}$ < .001 (see Figure 9). Post-hoc analyses indicated that groups of two ($\underline{M}$ =

11.53, $\underline{SD}$ = 1.04), groups of three ($\underline{M}$ = 11.80, $\underline{SD}$ = 1.74), and groups of five ($\underline{M}$ =

12.25, $\underline{SD}$ = 0.87) reported more correct neutral items than did individuals ($\underline{M}$ = 10.63,

$\underline{SD}$ = 1.67). This finding indicates that groups of two, three, and five were more accurate

than individuals. The between-groups factor of misinformation was not significant, nor

was the interaction.

Open-Ended Recall. In order to determine if the effect of group discussion would

impact memory recall as well as recognition, a 2 (misinformation) X 4 (group size)

between-groups factorial ANOVA was conducted on the reporting of misinformation

items for the open-ended test. Participants' answers were coded as endorsing the

misleading details if any aspect of the detail was included in the description (e.g., if a

participant wrote that the participant was wearing an earring then it was deemed that the

participant endorsed the idea that the offender was wearing a gold earring). If

participants specifically stated that the misleading detail was not evident then they were

not endorsing that item. However, if there was no mention of the misleading detail then

they were placed into an 'other' condition. Significant main effects were found for both

the misinformation factor, $F (1, 222) = 32.00$, $p < .001$, and the group size factor, $F (3,$

$232) = 3.00$, $p < .05$. Misled participants reported more misleading items $(M = 2.05$, SD

$= 1.25)$ than non-misled participants $(M = 1.28$, $SD = 0.89)$. Regarding group size, post-

hoc analyses revealed that participants who completed all tasks individually reported

more misleading items $(M = 1.97$, $SD = 1.12)$ than participants who were in a group of

two or three $(M = 1.50$, $SD = 1.09$; $M = 1.45$, $SD = 0.83$, respectively). Participants in

groups of two or three did not differ from each other, and participants who were in a

group of five $(M = 1.73$, $SD = 1.12)$ did not differ from any of the other three conditions.

Thus, although the misinformation effect was evident, it appears that group members

corrected each other where the misleading items were concerned.

Endorsement Rates. It may be the case that group discussion results in a "majority

rules" decision rule. We believed that if a majority (e.g., approximately 60%) of

participants correctly identified a neutral item prior to group discussion then this majority

would become even greater (e.g., approximately 70%) following group discussion. We

also believed that an original minority would become even fewer following group

discussion, however an original minority never occurred. To investigate the possibility

that differing initial item endorsement rates might influence subsequent group discussion

effects on recognition accuracy, item endorsement rates were broken down for

individuals versus those who participated in groups, in terms of the percentage of

participants who correctly identified each of the neutral items both prior to and following

group discussion (see Table 1). Similarly, we expected that if a majority of participants

endorsed a misleading item prior to group discussion then this majority would become

even greater following group discussion. As well, an original minority who initially

endorsed a misleading item would decrease following group discussion. See Table 2 for

the percentage of participants, categorized as either misled or non-misled, who endorsed

the misleading items prior to and following group discussion. As expected, the

misleading item with the highest initial endorsement rate (i.e., 'empty') became even

higher following group discussion, while the misleading items with the lowest initial

endorsement rates either stayed the same or decreased following group discussion.

Majority Rules. In order to further investigate the hypothesis that a majority rules

decision scheme (excluding items that were unanimously selected by each group member

on the pre-group test) was being utilized during group discussion, we examined if the

number of participants in each group who initially endorsed each misleading item

predicted the eventual group decision. Among misled participants in the group

conditions, majorities ruled for 73% of the final decisions where the misleading items

were concerned. Further, when the majority was split three to two, majority ruled 63% of

the time. When the majority was four to one, majority ruled 86% of the time. Among non-misled participants majority ruled on 75% of the groups' decisions. When the majority was split three to two, then majority ruled 55% of the time. When the majority was split four to one, then the majority ruled 86% of the time. Other possibilities that were explored were that highest confidence ruled (i.e., the group's decision was based on the participant with the highest confidence) or higher average confidence ruled (i.e., the group's decision was based on the answer with the higher average confidence). Highest confidence, disregarding majority, ruled 58% of the time for both misled and non-misled participants. Higher average confidence ruled 59% of the time for misled participants, and 48% of the time for non-misled participants. It appears, then, that group answers were primarily dominated by the initial majority.

Discussion

The original hypothesis, involving a replication of the misinformation effect, was supported in this study such that misleading items were reported more frequently by participants in the misled compared to the non-misled conditions. The hypothesis that groups would report more correct neutral (i.e., factual) items than individuals was also supported. In this respect, these results replicate those of Clark et al. (1990), Stephenson et al. (1986), and Yarmey and Morris (1998). However, the prediction that misled groups would report more misleading items than misled individuals was not supported. In fact, the opposite was found to be true; on the directed open-ended task participants who were in a group of two, three, or five reported fewer misleading items than did participants who completed all tasks individually.

Effect of Misinformation Manipulation. The finding that participants who were introduced to misleading information during initial questioning subsequently reported more of these items than participants who were not exposed to the misinformation replicates findings from the cognitive psychology literature involving eyewitness memory (e.g., Loftus et al., 1978; Zaragoza & Mitchell, 1996). The current findings are not surprising as a similar paradigm and memory tests (recognition and open-ended recall) were utilized as those that have consistently demonstrated the misinformation effect. Some questions on the recognition tests which concerned the misleading information were of the "yes/no" type that have been shown to produce the misinformation effect (e.g., Tversky & Tuchin, 1989), while others were similar to the standard recognition test in which participants have a choice between the original and misleading items (e.g., Loftus et al., 1978). Further, the type of open-ended recall test that was utilized was similar to that employed by Belli et al. (1994) in that participants were requested to write down as much information as they could remember about specific items (e.g., the offender's jewelry).

Group Discussion Effects. Group discussion appeared to have two major effects upon participants' memory for the video. First, recognition for factual (neutral) items increased following group discussion. That is, participants had higher accuracy on neutral items following group discussion than they had prior to group discussion. Thus, it appears that group members were pooling their resources, which then enabled them to subsequently correct each others' incomplete memory for details of the event, compared to participants who completed all tasks individually and were not exposed to this informational influence (e.g., Deutsch & Gerard, 1955). These results replicate Clark et

al.'s (1990) "social remembering" findings in which groups were found to be more accurate than individuals.

Secondly, there was a reduction (rather than a hypothesized increase) in the misinformation effect on the post-group test. Participants reported fewer misleading responses after group discussion, or individual thought, than they had before group discussion. The means from our group size X test interaction indicated that while misled individuals showed a decrease in the reporting of misinformation items from pre-group to post-group tests, participants in misled groups demonstrated a somewhat greater decrease (although the rates of decrease for individuals versus those in groups were not significantly different). However, it is problematic to our study when misled individuals, who have had no chance for discussion, show this decrease. Something other than group discussion, such as a testing effect, may have led to this decrease. Repeated exposure to incorrect information may have alerted misled individuals that some details included in the questionnaire may have been incorrect, which could then lead them to be skeptical of the accuracy of the information that was presented to them. Among those participants in groups, group members may also be correcting each other on the misleading items, rather than simply pooling their misinformed memory resources together. Thus, one possibility is that members of a group correct the misinformation errors made by other group members, which then enables the group members to subsequently report fewer of these items as being present. Participants who completed all recognition tasks individually reported more misleading items on the open-ended test than participants who were in groups of two, three, or five, indicating a superiority of group recall over individual recall for this measure of the misinformation effect.

While examining initial endorsement rates following the completion of Experiment 1, we began to wonder if the misleading items were rejected within the groups simply because the majority always ruled. Our endorsement rates indicated that at least half of the participants correctly rejected the misleading items on the pre-group test on four of the five misleading items. However, what would happen if a majority of the participants initially incorrectly endorsed the misleading details and then entered group discussion? Would we then see an increase in the reporting of these misleading items on subsequent individual recognition tasks, as suggested by a "majority rules" decision rule? With these ideas in mind, we developed Experiment 2.

Experiment 2

Contrary to the original hypotheses, the results from Experiment 1 indicated that participants who were in the misled-group conditions reported fewer (rather than more) misleading items than participants who were in the misled-individual conditions. What might account for this? One possible explanation for this finding will be explored in Experiment 2. The possible explanation involves differential base-rates leading to majority influence scenarios involving the misleading information. This possibility (majority influence) leads to an extension of Experiment 1's basic methodology. Experiment 2 will further investigate the effects of misinformation and group collaboration involving reports of particular misinformation items of varying initial base rates (i.e., misleading items that are endorsed by approximately 55 - 66% of misled participants prior to group discussion versus those that are initially endorsed by approximately 21 -38% of misled participants). Research involving the influence of

groups on individual reports in social psychological and eyewitness memory contexts

will now be reviewed.

Majority Influence

It is hypothesized that while the overall misinformation effect will be replicated, a

majority influence scenario will occur during group discussion, thus affecting both the

group and post-group tests. That is, in Experiment 1 most group members originally

responded correctly to the questions concerning the misleading items (i.e., reported the

correct rather than misleading information). This correct majority could have then

"convinced" the incorrect minority that the misleading items were not present or did not

occur. However, what would happen if most group members had originally responded

incorrectly to the questions concerning the misleading items (i.e., reported that the

misinformation details were present)? Would we then see misled participants in groups

report more misleading items than misled participants who completed all tasks

individually? Experiment 2 will attempt to answer this question.

It is predicted that on the misleading items which a majority of participants

initially endorse, that this majority will become an even larger majority following group

discussion. It is thought that a majority of participants will initially endorse these items

and then "convince" their group members that these items occurred. While not all group

members will privately accept the group's decisions on the subsequent individual

recognition test, some members of each group are expected to now believe that the

misleading items occurred in the video. Hence, there will be an increase in the number of

participants who endorse these items after group discussion. The same process is

expected to occur with those misleading items that a minority of participants initially

endorse, however this minority will become a smaller minority following group discussion as participants have (correctly) convinced other group members that the misleading items did not occur in the video. However, how will group members develop a strategy that will allow them to access the greatest amount of knowledge that is possible? One possibility is that each group will develop their own transactive memory.

Transactive Memory

In every group situation each person is considered to be somewhat knowledgeable at some part of the task to be completed. However, how does each group go about determining who is the expert for each part of the task? Wegner (1987) describes the group process of storage, encoding, and retrieval of information as transactive memory. It is through these processes that a group decides who the 'expert' is. According to Wegner this transactive memory allows the group access to much more information than that which any one individual can provide. Transactive memory permits groups to perform better (i.e., more accurate recall and fewer errors) than individuals on tasks ranging from assembling a radio to knowledge questions (e.g., Hollingshead, 1998a, 1998b, 1998c; Liang, Moreland, & Argote, 1995; Moreland & Myaskovsky, 2000). However, it should be noted that while every group will eventually develop a transactive memory, this process takes time. Intimate couples (i.e., couples who have dated for more than six months and have a well-developed transactive memory) have been found to have more accurate recall on knowledge questions such as science, math, and food, than strangers (e.g., Hollingshead, 1998b; Wegner, Erber, & Raymond, 1991). As well, it should be noted that groups whose members were trained as a group rather than as

individuals outperform groups whose members were trained as individuals in terms of

correct recall and fewer errors (e.g., Moreiand, Argote, & Krishnan, 1996).

It appears that a group will outperform an individual because it has access to more

information than an individual. However, in the present study our groups have not been

trained together nor do they have an intimate relationship, that is they are strangers.

Some research has shown that a nominal group (i.e., participants who are tested

individually and simply given the name "group") will outperform a collaborative group

on recall of words (e.g., Weldon, 2000; Weldon & Bellinger, 1997). Research by

Basden, Basden, Bryner, and Thomas (1997), and Basden, Basden, Thomas, and

Souphasith (1997) has replicated these findings. These researchers have postulated that

collaborative group members experience a retrieval inhibition. That is, each individual of

a group has his/her own preferred strategy to remember a set of items, but when placed

into a group this strategy is interrupted due to each individual paying attention to the

other members in the group rather than focussing on his/her answer. This may occur in

an eyewitness memory study as participants may be listening to, and considering, the

responses of other group members rather than trying to remember the video and their own

previous answers.

<u>Results from Source Memory Tests</u>

As mentioned earlier a recall test that asks participants fill-in-the-blank type

questions has been shown to reduce the misinformation effect (Zaragoza et al., 1987).

There is a further type of memory task that appears to reliably reduce the misinformation

effect. This type of test is referred to as a source memory test. A source memory test

asks participants to identify the source of their memory for certain details; that is do

participants report obtaining information about these details from the original event (e.g.,

a video), from a post-event source such as a narrative or questionnaire, from both

sources, or from neither source. It is thought that a source memory test eliminates the

misinformation effect because it requires participants to actively, rather than passively,

examine their recall of the information (Lindsay & Johnson, 1989). The standard

recognition test does not require participants to actively examine their memories, but

rather appears to allow participants to use a "loose decision criteria" (Multhaup, De

Leonardis, & Johnson, 1999) in which they may be relying on only one type of

information, such as familiarity, to make their decision.

Multhaup (1995) demonstrated that a reduced suggestibility effect was found

when a source-monitoring test was used with the false-fame paradigm. Multhaup et al.

(1999) predicted that similar results would be found in an eyewitness paradigm. The

results did indeed indicate that there was a reduced misinformation, or suggestibility,

effect for those participants who completed a source monitoring test versus a standard

recognition test. Multhaup et al. concluded that the misinformation effect can be reduced

under conditions in which a strict decision criteria is applied (i.e., a source monitoring

test).

Source monitoring tests (which have been found to reduce the misinformation

effect) have generally not been accompanied in the same study by a recognition test

(which reliably produces the misinformation effect). We incorporated both types of

memory tests into Experiment 2 in order to determine if the source-monitoring test will

also reduce the misinformation effect when it is preceded by a recognition test. That is, is

it possible to both demonstrate (on the recognition tests) and reduce the misinformation effect (on the source monitoring test) within the same study?

So, how do these findings relate to the present study? Six misleading items were included in the study; three of which a majority of misled participants were expected to initially answer incorrectly (i.e., be misled and choose the misinformation option); and three of which a minority of participants were expected to be misled on. It is expected that following group discussion the majority and minority misled responses should be even more polarized (i.e., more than 66% or less than 21%, respectively, will subsequently report the misinformation). These results are expected because we believe that a majority of participants, whether they endorse or do not endorse the misleading items, will be able to "convince" the minority that their answer is correct. However, it is not expected that all group members will privately accept these answers on the post-group test. Accordingly, on the post-group test it is expected that, when compared to the pre-group test, a majority will become a larger majority and a minority will become a smaller minority.

Method

Participants. The present study involved 180 students (each of the six treatment conditions had an equal number of participants, i.e., 60 in the individual condition, 30 groups of two, and 10 groups of six) from the Introductory Psychology participant pool at Wilfrid Laurier University. Participants were tested in groups of 8-18, and received one course credit for their involvement.

Design. This study involved a 2 (misinformation: misled/not misled) X 3 (group size: individual, or groups of 2, or 6) X 2 (number of recognition tests completed

individually by each participant) mixed Analysis of Variance (ANOVA) design. The participants received either misleading or non-misleading information in a post-event questionnaire concerning a mock crime video. Within each of these conditions (misled/non-misled), participants completed three recognition tests: one prior to group discussion, the group discussion test (or in the case of individuals another individual test), and one post-group test.

The major dependent variables included the number of misinformation items reported during three recognition tests and one recall test, the number of majority and minority misleading items reported, and accuracy (i.e., the number of neutral items, those not involving misinformation, correctly identified) on neutral forced-choice items.

Procedure. Participants signed up on the Research Participation Board for a single session study entitled "An investigation into eyewitness testimony". Participants were asked to read and sign the Informed Consent (see Appendix N) upon arrival for the experimental session. All participants first viewed a two-minute video of a simulated robbery and shooting, and then received an experimental booklet containing the tasks to be completed for the study. This booklet contained a unique "participant number" for each participant in order to connect individuals' pre-group and post-group recognition tests.

After viewing the video, participants completed the first individual measure, the Desire for Control Scale (Burger, 1987; see Appendix O). Participants were given approximately four minutes to complete this task.

Participants then received a 22-item fixed-choice recognition questionnaire (with confidence level measurement) concerning details of the video. For half of the

participants the questionnaire contained misleading information embedded in six of the

questions (see Appendix P, indicated by ***), while the other half received non-

misleading information embedded in these six questions (see Appendix Q, indicated by

***). Three misleading questions were selected on the basis that a majority (i.e., 55% -

66%) of participants endorsed them in a pilot study (i.e., that the offender was smoking a

cigarette, had a tattoo, and was wearing a gold earring). The other three misleading

questions were selected on the basis that a minority (i.e., 21% - 38%) of participants

endorsed them in a pilot study (i.e., that the offender said 'move back', was wearing

glasses, and jumped on the counter). Two quantitative questions were a part of this

questionnaire; one concerned the length of time the offender was in the store, and the

other concerned the calmness/nervousness of the offender. Participants were asked to

indicate whether they were 'sure' or 'unsure' about their answers. Participants were

given approximately four minutes to complete this task.

Participants subsequently completed a 10-item fixed-choice recognition

questionnaire (with 'sure/unsure') concerning details of the video (see Appendix R).

This questionnaire lasted approximately two minutes.

Participants then completed the second filler task, Snyder's (1974) Self-

Monitoring Scale (see Appendix F), and took approximately three minutes.

Upon completion of the self-monitoring scale, participants in two conditions were

told that they will be placed into groups of two or six and that their task was to complete

a fixed-choice recognition test with a 'sure/unsure' scale (see Appendix S), which is a

slight modification from their first recognition test. Each group completed their test in a

separate room. All participants in the individual condition completed the same

recognition test (Appendix S) as participants in the group condition, and they also completed a famous names filler task (see Appendix H). This extra filler task was needed in order to equate the times taken for individuals versus groups. Participants in the group condition were given approximately 15 minutes to complete the recognition test, whereas participants in the individual condition were given the same amount of time to complete the recognition test and filler task. Participants in groups returned to the original testing room upon completion of the recognition test.

A fixed-choice recognition test with a 'same/different' scale (see Appendix T) was then administered, and included the six misleading items, 14 neutral items, and two quantitative questions. Participants received approximately four minutes to complete this task.

Participants then completed a directed open-ended recall test (see Appendix U) in which they were instructed to write down as much information as they could remember about specific events (e.g., the offender's jewelry). Participants were given five minutes to complete this task.

Participants then individually completed a source memory test (see Appendix V) in which they were asked to identify the source of their memories for various items. This task took four minutes to complete.

In order to investigate the dynamics of the group discussions, participants from the group conditions were asked to describe how their group resolved any differences that may have occurred during discussion (see Appendix W). As well, participants were asked about the extent to which the group discussion made them reconsider their original memories.

Participants were then given two minutes to describe their beliefs about the purposes of the study (see Appendix X), in order to determine if any participants were aware that they had been presented with misinformation concerning the video[3]. Participants were then provided with a verbal summary of the study, given an "Information about the study" sheet (see Appendix Y), and any questions or concerns that they had about the research were addressed.

Results

Misinformation Reports on Pre-Group Recognition Test.

Separate chi-square tests of independence were conducted to determine if misled participants selected each misleading item proportionately more than did non-misled participants on the pre-group recognition test. The results indicated that the misinformation effect was evident for five of the six misleading items: (the offender had a tattoo: X^2 (1, $\underline{N}$ = 180) = 49.47, $\underline{p}$ < .001; was wearing a gold earring: X^2 (1, $\underline{N}$ = 179) = 48.86, $\underline{p}$ < .001; jumped on the counter: X^2 (1, $\underline{N}$ = 180) = 33.16, $\underline{p}$ < .001; was wearing glasses: X^2 (1, $\underline{N}$ = 180) = 27.22, $\underline{p}$ < .001; was smoking a cigarette: X^2 (1, $\underline{N}$ = 180) = 58.24, $\underline{p}$ < .001; and the use of the word 'move': X^2 (1, $\underline{N}$ = 179) = 2.69, $\underline{p}$ = .10). Interestingly, as in the first study, the item that involved wording was not reported more often by misinformed participants.

In order to determine the extent of the misinformation effect on the pre-group recognition test, an independent samples t-test was conducted. The results indicated that misled participants reported more of the misleading items ($\underline{M}$ = 3.04, $\underline{SD}$ = 1.74) than did non-misled participants ($\underline{M}$ = 0.79, $\underline{SD}$ = 0.79), $\underline{t}$ (176) = 11.16, $\underline{p}$ < .001.

Group Size Manipulation. To assess the impact of group discussion on individual

recognition for the misinformation items, a 2 (misinformation: misled/not misled) X 3

(group size: 1, 2, 6) X 2 (test: pre-group/post-group) mixed ANOVA was conducted on

the pre-group and post-group individual tests. Significant main effects were found for the

between-subjects factor of misinformation and group size, and for the within-subjects

factor of test. However, there was a significant interaction of misinformation X test, F (1,

172) = 17.13, p < .001 (see Figure 10). Misled participants reported more misleading

items both prior to and following group discussion than did non-misled participants.

Misled participants reported fewer misinformation items following group discussion than

prior to the discussion, whereas the non-misled participants did not show this decrease

(however, this could be the result of a floor effect).

Regarding the main effect of group size on misleading recognition, collapsed over

test, participants in the individual condition reported more misleading items (M = 1.89,

SD = 1.93) than did participants who were in groups of six (M = 1.18, SD = 1.37), while

participants who were in groups of two (M = 1.67, SD = 1.47) did not differ from either

condition, F (2, 172) = 6.10, p < .01. The misinformation X group size interaction

approached significance, F (2, 172) = 2.88, p = .06. These results indicated that misled

participants in the individual condition and groups of two reported more misleading items

than groups of six, while non-misled participants did not display this difference between

the different conditions.

While the misinformation X group size X test interaction failed to reach

significance, a further examination of the means for the misled participants was

conducted in order to assess the a priori hypothesis that group discussion would reduce

the number of misleading items that were reported following this discussion (see Figure

11). Participants in groups of six reported the fewest number of misleading items on both

the pre-group and post-group tests. While participants in the individual condition showed

a slight decrease across tests in the reporting of misleading items, participants in groups

of two and six showed a somewhat larger and equivalent decrease from pre to post-group

testing.

Majority Misinformation Items. From the results of our pilot study we predicted

that a majority of misled participants would report the following items: that the offender

had a tattoo, was wearing a gold earring, and was smoking a cigarette. To assess the

effect of group discussion on subsequent individual recognition for these majority

misleading items, a 2 (misinformation) X 3 (group size) X 2 (test) mixed ANOVA was

conducted on the pre-group and post-group tests. It should be noted that approximately

50% of misled participants reported that the offender was smoking a cigarette on the pre-

group test, and hence this item was omitted from this analysis as it did not meet the

requirement of being endorsed by a majority of misled participants. Significant main

effects were found for the between-subjects factors of misinformation and group size, and

for the within-subject factor of test. However, there was an interaction of misinformation

X test, $F(1, 173) = 15.61$, $p < .001$ (see Figure 12). Misled participants reported more

majority misleading items than did non-misled participants on both the pre-group and

post-group tests. As well, misled participants showed a significant decrease in the

reporting of these items from pre to post-group testing, while the non-misled participants

did not exhibit as large of a decrease.

Examining the main effect of group size, participants in groups of two ($\underline{M}$ = 0.8220, $\underline{SD}$ = 0.8360) reported more of the majority misinformation items than participants in the groups of six ($\underline{M}$ = 0.5750, $\underline{SD}$ = 0.6831), while participants in the individual condition ($\underline{M}$ = 0.8167, $\underline{SD}$ = 0.8672) did not differ from these two conditions, $\underline{F}$ (2, 173) = 3.77, $\underline{p}$ < .05. Thus, the largest group reported fewer majority misinformation items than the smaller group or individual conditions.

Again the misinformation X group size X test interaction was non-significant, but we examined the means to assess our a priori hypothesis that group discussion would lead to an increase in the number of these items that were reported following group discussion for misled participants (see Figure 13). There were no pre-group differences, however participants in groups of two and six displayed a greater reduction in the reporting of the 'majority' misinformation items from pre to post-group testing than did participants in the individual condition.

Minority Misinformation Items. Based on the results of our pilot study we predicted that a minority of misled participants would report the following items: that the offender jumped on the counter, was wearing glasses, and said 'move' back. To assess the effect of group discussion on subsequent individual recognition for these minority misleading items, a 2 (misinformation) X 3 (group size) X 2 (test) mixed ANOVA was conducted on the pre-group and post-group tests. As with the majority misinformation items, there were significant effects of misinformation, group size, and test. Misled participants (M = 0.98, SD = 0.91) reported more of the minority misleading items than non-misled participants (M = 0.30, SD = 0.47), F (1, 173) = 52.25, p < .001. Participants in the individual condition (M = 0.79, SD = 0.89) reported more of these items than

participants in groups of six (M = 0.48, SD = 0.76), while participants in groups of two

(M = 0.67, SD = 0.72) did not differ from these two conditions, F (2, 173) = 3.63, p <

.05. More minority misleading items were reported on the pre-group test (M = 0.73, SD

= 0.85) than on the post-group test (M = 0.55, SD = 0.74), F (1, 173) = 11.85, p < .01.

No interactions reached significance for this analysis.

Again, in order to test our a priori hypothesis that group discussion would lead to

a reduction in the reporting of minority misinformation items, we examined the means for

our group size X test interaction for misled participants (see Figure 14). Although the

three-way interaction again failed to reach significance, an examination of the means

indicates that participants in all conditions demonstrated approximately the same rate of

decrease from the pre to post-group tests.

Misinformation Items. To determine the impact of group discussion on individual

recognition for the misleading items a 2 (misinformation) X 2 (groups: individuals versus

groups of two and six combined) X 2 (test) mixed ANOVA was conducted on the pre-

group and post-group tests. There were significant main effects for both of the between-

subjects factors of misinformation and groups, however these were qualified by a

significant misinformation X groups interaction, F (1, 174) = 4.95, p < .05 (see Figure

15). Misled participants, both individuals and those in groups, reported more misleading

items than did non-misled participants. However, participants in misled groups reported

fewer of these items than did participants in the misled-individual condition, while non-

misled participants did not exhibit this difference. There was also a significant main

effect of the within-subject factor of test, however this was qualified by a significant

misinformation X test interaction, F (1,174) = 14.96, p < .001 (see Figure 16). Misled

participants reported more misinformation items on both the pre-group and post-group

tests than did the non-misled participants. Misled participants showed a significant

decrease in the number of misinformation items reported from pre-group to post-group

test, while the non-misled participants did not display this decrease.

We again examined the means for this misinformation X groups X test interaction

to assess our a priori hypothesis that group discussion would lead to an increase in the

number of misinformation items that were reported (see Figure 17). Participants in

groups reported fewer misinformation items on both the pre-group and post-group tests,

and also showed a slightly greater reduction in the number of these items that were

reported from pre to post-group testing than did individuals.

To assess whether groups reported more misleading items than individuals, a 2

(misinformation) X 3 (group size) between-groups factorial ANOVA was conducted on

the group recognition test. There was a significant main effect for the misinformation

factor. Misled participants (M = 2.46, SD = 1.86) reported more misinformation items

than did non-misled participants (M = 0.55, SD = 0.77), F (1, 93) = 20.45, p < .001.

Again, the misinformation effect was evident during the group recognition test. Neither

the main effect of group size, nor the interaction reached significance.

Majority Misinformation Items. In order to determine if groups reported the two

majority misinformation items more often than individuals, a 2 (misinformation) X 3

(group size) between-groups ANOVA was conducted for the group recognition test. As

with the previous analysis the only effect which reached significance was the main effect

of misinformation. Misled participants (M = 1.04, SD = 0.88) reported more of the

majority misleading items than did non-misled participants (M = 0.28, SD = 0.54), F (1,

94) = 13.74, $p < .001$. Thus, on the group recognition test, the misinformation effect was evident for the majority misinformation items.

Minority Misinformation Items. Relatedly, in order to determine if groups reported more of the three minority misinformation items than individuals, a similar 2 (misinformation) X 3 (group size) between-groups ANOVA was conducted on the group recognition test. Again, only a significant main effect was found for the misinformation factor. Participants who were misled reported more minority misleading items ($\underline{M}$ = 1.08, $\underline{SD}$ = 0.90) than did participants who were not misled ($\underline{M}$ = 0.27, $\underline{SD}$ = 0.45), $\underline{F}$ (1, 93) = 15.44, $p < .001$. Again, the misinformation effect is evident.

Recognition of Neutral Items. To assess the impact of group discussion on subsequent individual recognition for the neutral items, a 2 (misinformation) X 3 (group size) X 2 (test) mixed ANOVA was conducted on the pre-group and post-group tests. The results indicated that there were significant main effects of group size and test, however these were qualified by a significant group size X test interaction, $\underline{F}$ (2, 174) = 18.61, $p < .001$ (see Figure 18). Simple main effects analyses revealed that there were no pre-group differences in the recognition of neutral items, and no increase across tests for participants in the individual condition. However, participants who had discussed the event in groups of two or six showed increases in correct neutral item recognition from pre-group to post-group testing. Thus, participants who discussed the video in groups improved their recognition accuracy for the neutral items, while participants in the individual condition did not show this increase.

To determine the impact of group discussion on subsequent individual recognition for the neutral items, a 2 (misinformation) X 2 (groups) X 2 (test) mixed ANOVA was

conducted on the pre-group and post-group tests. There was a significant main effect of test, however this was qualified by a significant groups X test interaction, F (1, 176) = 30.61, p < .001 (see Figure 19). As in the previous analysis, there were no pre-group differences, however participants in groups reported more correct neutral items following group discussion, while participants in the individual condition did not exhibit this increase. As well, participants in groups reported more correct neutral items following group discussion than participants in the individual condition.

To assess whether groups reported more correct neutral items than individuals, a 2 (misinformation) X 3 (group size) between-groups factorial ANOVA was conducted for the group recognition test. A significant main effect was found for the group size factor. Participants in groups of two (M = 10.90, SD = 1.52) and in groups of six (M = 11.60, SD = 1.26) reported more correct neutral items than participants in the individual condition (M = 9.97, SD = 1.35), F (2, 94) = 8.49, p < .001. Accordingly, the differences are in the predicted direction (i.e., large groups reported the greatest number of correct neutral items and the individual condition reported the fewest number of correct neutral items). Overall, then, groups tended to report more correct neutral items than individuals.

Quantitative Measures. To determine the impact of group discussion on subsequent individual reports about the length of time that the offender was in the store, a 2 (misinformation) X 3 (group size) X 2 (test) mixed ANOVA was conducted on the pre-group and post-group tests. (Note that two participants were excluded from these analyses as their time reports were longer than the video itself. Coincidentally, these two participants were randomly assigned to the same group of two, and this group was excluded from the group analyses). The results indicated a significant misinformation X

group size X test interaction, F (2, 172) = 7.11, p < .01 (see Figures 20 and 21). Amongst

misled participants (Figure 20) there were no pre-group differences in the time estimates.

However, participants in groups of six showed a significant increase in their time

estimate from pre to post-group testing, while participants in the individual condition and

in groups of two remained stable over tests. Amongst non-misled participants (Figure

21) there were again no-pre-group differences. However, on the post-group test

participants in groups of six showed a decrease, while participants in groups of two and

in the individual condition remained stable. It is unclear why this polarization effect was

evident in different directions for participants in the misled versus non-misled conditions.

Similarly, to assess whether participants in the individual condition would report

that the offender was in the store for differing periods of time than participants in groups

of two or six on the group test, a 2 (misinformation) X 3 (group size) between-groups

factorial ANOVA was conducted. None of the effects turned out to be significant.

To determine the impact of group discussion on subsequent individual reports

about the calmness/nervousness of the offender, a 2 (misinformation) X 3 (group size) X

2 (test) mixed ANOVA was conducted on the pre-group and post-group tests. There was

a significant main effect of the within-subjects factor of test, however this was qualified

by a significant group size X test interaction, F (2, 174) = 6.65, p < .01 (see Figure 22).

Participants in the individual and groups of two conditions did not show any change in

their rating across tests, however participants in groups of six showed a significant

increase in their rating from the pre-group to the post-group test.

Similarly, in order to determine the effects of group discussion on the group rating

about the calmness/nervousness of the offender, a 2 (misinformation) X 3 (group size)

between-groups factorial was conducted on the group test. Again, no effects were found

to be significant.

Open-Ended Recall. In order to determine if the effect of group discussion would

impact memory recall as well as recognition, a 2 (misinformation) X 3 (group size)

between-groups factorial ANOVA was conducted on the reporting of misinformation

items on the open-ended test. Significant main effects were found for both the

misinformation and group size factors, however these were qualified by a significant

misinformation X group size interaction, F (2, 174) = 4.00, p < .05 (see Figure 23).

While there were no group size differences among non-misled participants, individual

participants in the misled conditions reported more misinformation items than

participants in groups of six, with groups of two in between and not differing from either

condition. In fact, misled groups of six did not differ significantly from their non-misled

counterparts. Therefore, as with the recognition tests, the misinformation effect was

evident on the open-ended recall test for individuals and those in groups of two.

Participants in groups of six, however, appear to have corrected themselves and

eliminated the misinformation effect on the recall test.

Source-Monitoring Test. Separate chi-square tests of independence were

conducted to determine if misled participants identified the misleading items as occurring

in the video proportionately more often than non-misled participants. The results

indicated that misled participants incorrectly identified the video as the source of their

memories proportionately more often than non-misled participants for only two of the six

misleading items: presence of a tattoo: X^2 (1, N = 180) = 3.81, p = .05; and 'jumped on

the counter': X^2 (1, N = 180) = 4.04, p < .05 There were no differences found for:

wearing a gold earring: X^2 (1, N = 180) = 3.21, p = .07; smoking a cigarette: X^2 (1, N = 180) = 0.49, p = .49; and the use of the word 'move': X^2 (1, N = 180) = 0.40, p = .53. Interestingly, non-misled participants incorrectly identified the video as the source of their memories proportionately more often than misled participants for the idea that the offender was wearing glasses: X^2 (1, N = 180) = 27.22, p < .001. Thus, unlike the pre-group recognition test, there was a misinformation effect for only two of the items. And, in fact, there was a reverse misinformation effect for one of the items (i.e., the offender was wearing glasses).

Separate chi-square tests of independence were conducted to determine if participants in the individual, groups of two, or groups of six conditions incorrectly identified the misleading items as occurring in the video proportionately more often than any of the other conditions. The results indicated that participants in each condition were equally likely to attribute the source of their memories for the misleading items to sources other than the video; all X^2 values < 4.30, all p values > .10. Unlike the recognition tests, no group size effects were indicated on the source-monitoring test.

Endorsement Rates. We initially hypothesized that initial endorsement rates would influence increases or decreases in endorsement rates of neutral and misleading items following group discussion. That is, if there was a strong majority endorsement rate prior to group discussion then this majority should become even stronger. Indeed, for the neutral items we found this pattern (see Table 3). We also believed that the same pattern should occur for misleading items. A strong majority endorsement of the misleading items before group discussion should become even stronger, and a minority

endorsement should result in even fewer reports following group discussion. However, we found that among misled participants in groups, participants endorsed both majority and minority items less often following group discussion (see Table 4).

Majority Rules. Similar to Experiment 1, we examined the number of participants in each group who initially endorsed the misleading items and then compared that to their subsequent group answers. Among misled participants in groups, a majority rules decision scheme prevailed 68% of the time. Another possibility that was explored was that the answer with the most 'sure' responses would prevail as the eventual group decision. This occurred 66% of the time. Among non-misled participants, majority ruled 100% of the time, and the answer with the most 'sure' responses prevailed 81% of the time. While not as obvious as Experiment 1, it appears that majority ruled group discussions.

Discussion

As in Experiment 1, Experiment 2 also replicated the misinformation effect, thus supporting our initial hypothesis. That is, misled participants reported more misleading items on the recognition and recall tasks than did non-misled participants. Also replicating Experiment 1, our hypothesis that groups would report more correct neutral items than individuals was supported. Our prediction that participants in groups would report more majority misleading items on the group and post-group tests than individuals was not supported. In fact, all participants (those who were in groups as well as individuals) reported fewer of the misleading items on the third recognition test, independent of whether the items were initially endorsed by a majority or a minority. This finding was also demonstrated on the open-ended recall test such that participants in

the misled individual condition reported more of the misleading items than did misled

participants in groups of six. Taken together, the results of the present studies indicate a

robust misinformation effect, and, perhaps, an advantage of group discussion and/or

repeated questioning to counteract the impact of misleading post-event information.

Effect of Misinformation Manipulation. As in Experiment 1, the replication of the

misinformation effect is not surprising given that this effect has been reported in the

cognitive psychology and eyewitness literature for more than 20 years (e.g., Loftus et al.,

1978; Zaragoza & Mitchell, 1996). Both studies involved the use of a similar paradigm,

type of stimulus, and testing materials that have been shown to reliably demonstrate the

misinformation effect. The demonstration of the misinformation effect on the open-

ended recall test is also not surprising as Experiment 2 used the same type of recall test as

Experiment 1, modeled after Belli et al.'s (1994) open-ended recall test, in which

participants were instructed to write down as much information as they could remember

about certain details.

Group Discussion Effects. Again as in Experiment 1, group discussion appeared

to have two major impacts upon subsequent individual reports for the neutral and

misleading items. First, group discussion increased participants' reporting of correct

(factual) items. That is, participants who completed a recognition test as a member of a

group showed an increase in reports of correct neutral items following group discussion,

and this increase was larger for those in groups of six than those in groups of two.

Participants who completed all recognition and recall trials individually did not show an

increase in the number of correct neutral items that they reported.

Secondly, as in Experiment 1, participants in all conditions reported fewer of the misleading items on the final recognition task than they did initially. We found that participants in groups showed a slightly greater (albeit not significantly greater) reduction in the reporting of misinformation items than did participants in the individual condition. From the results of the first study it was not surprising that participants in groups (along with individuals) reported fewer misinformation items on the final recognition task. Importantly, this occurred for those misleading items that a strong majority of the misled participants had endorsed prior to group discussion (such as the idea that the offender had a tattoo and was wearing a gold earring). This runs counter to the original hypothesis that an incorrect majority would become an even stronger majority across recognition tasks. Again, it appears that group discussion and/or repeated testing leads to a reduction in the misinformation effect, regardless of the number of initially incorrect participants in a group. As in Experiment 1, participants in the individual condition also showed a decrease, which may be due to practice and/or repeated memory scrutiny.

In most analyses participants in groups of two fell in between groups of six and the individual condition. It seems that groups of two respond more similar to individuals in some situations, and more similar to groups of six in other situations. Future research should attempt to determine when groups of two respond like individuals, and when groups of two respond like larger groups. As well, the responses of participants in groups of varying intermediate sizes (i.e., 3, 4, and 5), and how they differ from individuals or larger groups, are left for further investigation.

Quantitative Measures. Responses to the two quantitative measures (i.e., the length of time that the offender was in the store and the calmness/nervousness of the

offender) seemed to display similar patterns. Participants who completed a quantitative

judgement task as a member of a group became more polarized toward the extreme

following group discussion than did participants in the individual condition. However,

there were some inconsistencies in our findings. Some analyses demonstrated that

participants in groups of two were more polarized toward the extreme, whereas in other

analyses participants in groups of six were more polarized toward the extreme.

Participants in the individual condition, however, remained stable across trials for both of

our quantitative measures. This finding is not surprising given that many studies

investigating group decision making indicate that participants' answers become more

polarized following group discussion (group polarization; Myers & Lamm, 1975; Myers

et al., 1977). Participants in groups tended to think that the offender was in the store for

significantly longer or shorter periods of time, and was significantly more or less

nervous, than did individuals. The circumstances under which this polarization led to

higher versus lower estimates remain to be investigated.

Source-Memory. Our results indicated that the source-monitoring test

counteracted the effects of misleading post-event information to a certain degree

(compared to a misinformation effect for five of the six items on the pre-group

recognition test) as misled participants incorrectly attributed only two of the six items to

the video more often than did non-misled participants, and there was even a reverse

misinformation effect for one of the misleading items. While it seems ironic that the

misinformation effect can both be demonstrated and reliably reduced in the same study, it

is not really surprising that the source-monitoring test counteracted the effect as this has

been reported in previous studies (e.g., Multhaup, 1995; Multhaup et al., 1999). Even

though the source-monitoring test followed the recognition tests and the open-ended

recall test, both of which produced the misinformation effect, our misinformation effect

was reduced. This may have occurred due to a stricter decision criterion in which

participants must actively remember the video, as postulated by Lindsay and Johnson

(1989). The recognition and open-ended recall tests may have allowed participants to use

a "loose decision criterion" (Multhaup et al., 1999) in which they passively examined

their memories. Given our results it appears that the stricter decision criterion was able,

to a moderate degree, to overcome the tendencies that developed as a result of the use of

a loose decision criterion.

General Discussion

These two studies each replicated the misinformation effect in that misled

participants reported more misleading items than did non-misled participants, and

demonstrated that group discussion improves subsequent individual accuracy for neutral

items, and may also result in fewer misinformation details being reported. The

superiority of group over individual recall, as per Stephenson et al. (1986), was

demonstrated for recall memory of a crime video. Concerning recognition memory, it

should be noted that there was a reduction in the reporting of misleading items by

individuals as well as groups, which calls into question whether this reduction was due to

group discussion or simply repeated testing.

Validity and Reliability Concerns. The external validity of these studies may be

called into question. All participants were university students, and more specifically

students enrolled in an introductory psychology course. The homogeneity of the

participant pool may result in the findings not being representative of a wider, non-

university population. University students may have above average I.Q. levels and

higher memory levels than non-students. Since suggestibility has been found to be

negatively related to intelligence and memory ability (e.g., Gudjonsson, 1983, 1986),

non-students may be even more prone to the misinformation effect than students.

As with most laboratory-based studies of eyewitness memory and testimony, the

ecological validity of these studies could be questioned. Participants in our studies

viewed a short video in a controlled lab setting that was under the direction of the

experimenter, whereas people in a real-life situation would be viewing the crime in an

uncontrolled setting where many variables could distract the eyewitness from accurately

and completely viewing the situation. Further, participants knew beforehand that they

were to be involved in a study of eyewitness memory and would be viewing a mock

crime video, which may have alerted them to pay particular attention to the offender's

appearance and actions. Taken together, these factors may have led to an enhanced

encoding and recall of the offender, and subsequently lower levels of misinformation.

In an actual eyewitness scenario, witnesses may be reluctant to yield to the

influence of group discussion if they believed that their testimony would be used to

weigh the guilt or innocence of a real suspect to a crime. A real witness who believes

very strongly that the suspect is not guilty, and who confidently recalls details not

recalled by the majority, is perhaps more likely to stick to his/her convictions and not be

persuaded to side with the majority, than a participants in a laboratory study of little

personal consequence.

As well, participants were questioned using a recognition (rather than solely an

open-ended recall) task, and groups were strongly encouraged to attempt to reach

consensus for each item of the group task. Real eyewitnesses would not necessarily receive this encouragement. Each of these effects may have influenced the extent to which participants felt pressured to provide an answer that they believed was incorrect.

There were pre-discussion group differences in the number of misinformation items that were initially endorsed when, actually, there should not have been any as up to that point all participants had been treated in the same manner (i.e., no treatment differences had occurred yet). The data indicated that participants who were later placed into groups endorsed fewer of the misleading items than participants who were randomly assigned to the individual condition. This occurred despite the fact that all participants knew beforehand that they may be placed into groups. The reasons for these baseline differences are unclear and may simply be a result of unhappy randomization.

Considerations for Future Research. Future research is necessary to delineate the circumstances under which mock eyewitnesses should and should not collaborate concerning the events of a crime. As well, since we have some evidence supporting a "social remembering" effect, further research is necessary to determine how this impacts positively and negatively on participants' memory reports. That is, on the post-discussion recognition and recall attempts, were participants' memories actually enhanced (i.e., were they exposed to additional correct information and recall prompts) or were participants simply reporting what they remembered other participants had said?

Future research may also want to 'mix-and-match' groups. That is, groups could be constructed to consist of some participants who were misled and others who were not. It would then be of interest to examine group and post-group recognition and recall concerning the reports of misleading items. Could misled participants 'convince' non-

misled participants that the misleading items were evident, or would non-misled

participants' veridical memories win over the 'misinformed memories' of the misled

participants? Such a possibility could also be explored by including a confederate

providing incorrect information in the group discussions.

Further, subsequent research could investigate the content of the group

discussions; to what extent do group members say that they distinctly remember events

from the video and/or that the details were simply presented in the questions? How are

disputes resolved; do minorities simply defer to majorities without debate, or is there a

debate which is dominated by the majority?

Forensic Applications. The results of the current studies suggest that group

members may be correcting each other when some among the group initially report

incorrect information, leading to a report of more correct details concerning viewed

events among groups than for individuals. It appears that "social remembering" increases

recognition for correct items. Future research could delineate the circumstances under

which group discussion enhances eyewitness recall in order to empirically evaluate the

guidelines by the U. S. Department of Justice (1999) which suggest that eyewitnesses

should not collaborate concerning witnessed events. However, it is not being suggested

that eyewitnesses should collaborate prior to giving their own account, but rather that

eyewitnesses could give their initial account and then be allowed to collaborate with

other witnesses when police investigations are at a stalemate. This collaboration may

increase subsequent recall accuracy and decrease the amount of incorrect misinformation

that witnesses provide to investigating officers and subsequently to triers-of-fact in a

courtroom setting.

References

Alper, A., Buckhout, R., Chern, S., Harwood, R., & Slomovits, M. (1976).

Eyewitness identification: Accuracy of individual vs. composite recollections of a crime.

Bulletin of the Psychonomic Society, 8, 147-149.

Asch, S. E. (1951). Effects of group pressure upon the modification and distortion

of judgment. In H. Guetzkow (Ed.), Groups, leadership, and men. Pittsburgh, PA:

Carnegie.

Asch, S. E. (1956). Studies of independence and conformity: A minority of one

against unanimous majority. Psychological Monographs, 70 (Whole no. 416).

Baron, R. S., Vandello, J. A., & Brunsman, B. (1996). The forgotten variable in

conformity research: Impact of task importance on social influence. Journal of

Personality and Social Psychology, 71, 915-927.

Basden, B. H., Basden, D. R., Bryner, S., & Thomas, R. L. III, (1997). A

comparison of group and individual remembering: Does collaboration disrupt retrieval

strategies? Journal of Experimental Psychology: Learning, Memory, and Cognition, 23,

1176-1189.

Basden, B. H., Basden, D. R., Thomas, R. L. III, & Souphasith, S. (1997).

Memory distortion in group recall. Current Psychology, 16, 225-246.

Belli, R. F., Lindsay, D. S., Gales, M. S., & McCarthy, T. T. (1994). Memory

impairment and source misattribution in postevent information experiments with short

retention intervals. Memory & Cognition, 22, 40-54.

Belli, R. F., Windschitl, P. D., McCarthy, T. T., & Winfrey, S. E. (1992). Detecting memory impairment with a modified test procedure: Manipulating retention interval with centrally presented event items. Journal of Experimental Psychology: Learning, Memory, and Cognition, 18, 356-367.

Braun, K. A., & Loftus, E. F. (1998). Advertising's misinformation effect. Applied Cognitive Psychology, 12, 569-591.

Christiaansen, R. E., & Ochalek, K. (1985). Editing misleading information from memory: Evidence for the co-existence of original and post-event information. Memory & Cognition, 11, 467-475.

Clark, N. K., Stephenson, G. M., & Kniveton, B. H. (1990). Social remembering: Quantitative aspects of individual and collaborative remembering by police officers and students. British Journal of Psychology, 81, 73-94.

Cook, M. A., & Gwynn, M. I. (2000, June). Social influence and the misinformation effect: The effect of misleading peer reports on eyewitness testimony. Poster session presented at the annual meeting of the Canadian Psychological Association, Ottawa, Ontario, Canada.

Crowne, D. P., & Marlowe, D. (1960). A new scale of social desirability independent of psychopathology. Journal of Consulting Psychology, 24, 349-354.

Cutler, B. L., Penrod, S. D., & Stuve, T. E. (1988). Juror decision making in eyewitness identification cases. Law and Human Behavior, 12, 41-56.

Deutsch, M., & Gerard, H. G. (1955). A study of normative and informational influence upon individual judgment. Journal of Abnormal and Social Psychology, 51, 629-636.

Echlin, D., & Cockerton, T. (1996). The misinformation effect and the individual

mnemonics of the cognitive interview. Issues in Criminological and Legal Psychology,

26, 58-66.

Geiselman, R. E., Fisher, R. P., Firstenberg, I., Hutton, L. A., Sullivan, S. J.,

Avetissian, I. V., & Prosk, A. L. (1984). Enhancement of eyewitness memory: An

empirical evaluation of the cognitive interview. Journal of Police Science and

Administration, 12, 74-80.

Greene, E., Flynn, M., & Loftus, E. F. (1982). Inducing resistance to misleading

information. Journal of Verbal Learning and Verbal Behavior, 21, 207-219.

Hall, D. F., Loftus, E. F., & Tousignant, J. P. (1984). Postevent information and

changes in recollection for a natural event. In G. L Wells & E. F. Loftus (Eds.),

Eyewitness testimony: Psychological perspectives (pp. 124-141). New York, NY: Press

Syndicate of the University of Cambridge.

Higham, P. A. (1998). Believing details known to have been suggested. British

Journal of Psychology, 89, 265-283.

Hollin, C. R., & Clifford, B. R. (1983). Eyewitness testimony: The effects of

discussion on recall accuracy and agreement. Journal of Applied Social Psychology, 13,

234-244.

Hollingshead, A. B. (1998a). Communication, learning, and retrieval in

transactive memory systems. Journal of Experimental Social Psychology, 34, 423-442.

Hollingshead, A. B. (1998b). Retrieval processes in transactive memory systems.

Journal of Personality and Social Psychology, 74, 659-671.

Hollingshead, A. B. (1998c). Group and individual training: The impact of practice on performance. Small Group Research, 29, 254-280.

Hosch, H. M., & Platz, S. J. (1984). Self-monitoring and eyewitness accuracy. Personality and Social Psychology Bulletin, 10, 289-292.

Jones, E., & Gerard, H. B. (1967). Foundations of Social Psychology. Wiley, New York.

Kebbell, M. R., & Wagstaff, G. F. (1999). Face value? Evaluating the accuracy of eyewitness information. Police Research Series, Paper 102, London.

Kenny, D. A., Kashy, D. A., & Bolger, N. (1998). Data analysis in social psychology. In D. T. Gilbert & S. T. Fiske (Eds.), The handbook of social psychology (pp. 233-265). New York, NY, USA: McGraw-Hill.

Latane, B., & Wolf, S. (1981). The social impact of majorities and minorities. Psychological Review, 88, 438-453.

Levinger, G., & Schneider, D. J. (1969). A test of the "risk is a value" hypothesis. Journal of Personality and Social Psychology, 11, 165-169.

Liang, D. W., Moreland, R., & Argote, L. (1995). Group versus individual training and group performance: The mediating role of transactive memory. Personality and Social Psychology Bulletin, 21, 384-393.

Lindsay, D. S. (1990). Misleading suggestions can impair eyewitness's ability to remember event details. Journal of Experimental Psychology: Learning, Memory, and Cognition, 16, 1077-1083.

Lindsay, D. S., & Johnson, M. K. (1989). The eyewitness suggestibility effect and memory for source. Memory & Cognition, 17, 349-358.

Lindsay, R. C. L., Wells, G. L., & Rumpel, C. M. (1981). Can people detect eyewitness identification accuracy within and across situations. Journal of Applied Psychology, 66, 482-489.

Loftus, E. F. (1975). Leading questions and the eyewitness report. Cognitive Psychology, 7, 560-572.

Loftus, E. F. (1977). Shifting human color memory. Memory & Cognition, 5, 696-699.

Loftus, E. F., Donders, K., Hoffman, H. G., & Schooler, J. W. (1989). Creating new memories that are quickly accessed and confidently held. Memory & Cognition, 17, 607-616.

Loftus, E. F., Miller, D. G., & Burns, H. J. (1978). Semantic integration of verbal information into a visual memory. Journal of Experimental Psychology: Human Learning and Memory, 4, 19-31.

Maass, A., & Clark, R. D. III (1983). Internalization versus compliance: Differential processes underlying minority influence and conformity. European Journal of Social Psychology, 13, 197-215.

McCloskey, M., & Zaragoza, M. (1985). Misleading postevent information and memory for events: Arguments and evidence against memory impairment hypotheses. Journal of Experimental Psychology: General, 114, 1-16.

Moreland, R. L., & Myaskovsky, L. (2000). Exploring the performance benefits of group training: Transactive memory or improved communication? Organizational Behavior and Human Decision Processes, 82, 117-133.

Moreland, R. L., Argote, L., & Krishnan, R. (1996). Socially shared cognition at work: Transactive memory and group performance. In J. L. Nye & A. M. Brower (Eds.), What's social about social cognition? Research on socially shared cognition in small groups (pp. 57-84). Thousand Oaks, CA, USA: Sage Publications, Inc.

Moscovici, S. (1976). Social Influence and Social Change. Academic Press, London.

Moscovici, S. (1980). Toward a theory of conversion behavior. In Berkowitz, L. (Ed.), Advances in Experimental Social Psychology, 13, 209-239.

Multhaup, K. S. (1995). Aging, source, and decision criteria: when false fame errors do and do not occur. Psychology and Aging, 10, 492-497.

Multhaup, K. S., De Leonardis, D. M., & Johnson, M. K. (1999). Source memory and eyewitness suggestibility in older adults. The Journal of General Psychology, 126, 74-84.

Myers, D. G. (1978). Polarizing effects of social comparison. Journal of Experimental Social Psychology, 14, 554-563.

Myers, D. G., & Arenson, S. J. (1972). Enhancement of dominant risk tendencies in group discussion. Psychological Reports, 30, 615-623.

Myers, D. G., & Bishop, G. D. (1971). Enhancement of dominant attitudes in group discussion. Journal of Personality and Social Psychology, 20, 386-391.

Myers, D. G., & Kaplan, M. F. (1976). Group-induced polarization in simulated juries. Personality and Social Psychology Bulletin, 2, 63-66.

Myers, D. G., & Lamm, H. (1976). The polarizing effect of group discussion. American Scientist, 63, 297-303.

Myers, D. G., Wojcicki, S. B., & Aardema, B. S. (1977). Attitude comparison: Is there ever a bandwagon effect? Journal of Applied Social Psychology, 7, 341-347.

Pruitt, D. G. (1971a). Choice shifts in group discussion: An introductory review. Journal of Personality and Social Psychology, 20, 339-360.

Pruitt, D. G. (1971b). Conclusions: Toward an understanding of choice shifts in group discussion. Journal of Personality and Social Psychology, 20, 493-510.

Shaughnessy, J. J., & Mand, J. L. (1982). How permanent are memories for real-life events? American Journal of Psychology, 95, 51-63.

Snyder, M. (1974). Self-monitoring of expressive behavior. Journal of Personality and Social Psychology, 30, 526-537.

Stephenson, G. M., Brandstaetter, H., & Wagner, W. (1983). An experimental study of social performance and delay on the testimonial validity of story recall. European Journal of Social Psychology, 13, 175-191.

Stephenson, G. M., Clark, N. K., & Kniveton, B. (1989). Collaborative testimony by police officers: A psycho-legal issue. In H. Wegener, F. Losel, & J. Haisch (Eds.), Criminal behavior and the justice system: Psychological perspectives (pp.254-270). New York, NY: Springer-Verlag.

Stephenson, G. M., Clark, N. K., & Wade, G. S. (1986). Meetings make evidence? An experimental study of collaborative and individual recall of a simulated police interrogation. Journal of Personality and Social Psychology, 50, 1113-1122.

Stephenson, G. M., & Wagner, W. (1989). Origins of the misplaced confidence effect in collaborative recall. Applied Cognitive Psychology, 3, 227-236.

Tousignant, J. P., Hall, D., & Loftus, E. F. (1986). Discrepancy detection and

vulnerability to misleading postevent information. Memory & Cognition, 14, 329-338.

Tversky, B., & Tuchin, M. (1989). A reconciliation of the evidence on eyewitness

testimony: Comments on McCloskey and Zaragoza. Journal of Experimental Psychology:

General, 118, 86-91.

Underwood, G., & Milton, H. (1993). Collusion after a collision: Witnesses'

reports of a road accident with and without discussion. Applied Cognitive Psychology, 7,

11-22.

Warnick, D. H., & Sanders, G. S. (1980). The effects of group discussion on

eyewitness accuracy. Journal of Applied Social Psychology, 10, 249-259.

Wegner, D. M. (1987). Transactive memory: A contemporary analysis of the

group mind. In B. Mullen & G. R. Goethals (Eds.), Theories of group behavior (pp. 185 -

208). New York: Springer-Verlag.

Wegner, D. M., Erber, R., & Raymond, P. (1991). Transactive memory in close

relationships. Journal of Personality and Social Psychology, 61, 923-929.

Weldon, M. S. (2000). Remembering as a social process. The Psychology of

Learning and Motivation, 40, 67-120.

Weldon, M. S., & Bellinger, K. D. (1997). Collective memory: Collaborative and

individual processes in remembering. Journal of Experimental Psychology: Learning,

Memory, and Cognition, 23, 1160-1175.

Wells, G. L., Lindsay, R. C. L., & Ferguson, T. J. (1979). Accuracy, confidence,

and juror perceptions in eyewitness identification. Journal of Applied Psychology, 64,

440-448.

Wright, D. B., & Stroud, J. N. (1998). Memory quality and misinformation for

peripheral and central objects. Legal and Criminological Psychology, 3, 273-286.

Yarmey, A. D. (1992). The effects of dyadic discussion on earwitness recall.

Basic and Applied Social Psychology, 13, 251-263.

Yarmey, A. D., & Morris, S. (1998). The effects of discussion on eyewitness

memory. Journal of Applied Social Psychology, 28, 1637-1648.

Zaragoza, M. S., & Koshmidir, J. W. (1989). Misled subjects may know more

than their performance implies. Journal of Experimental Psychology: Learning, Memory,

and Cognition, 15, 246-255.

Zaragoza, M. S., & Lane, S. M. (1994). Source misattributions and the

suggestibility of eyewitness memory. Journal of Experimental Psychology: Learning,

Memory, and Cognition, 20, 934-945.

Zaragoza, M. S., McCloskey, M., & Jamis, M. (1987). Misleading postevent

information and recall of the original event: Further evidence against the memory

impairment hypothesis. Journal of Experimental Psychology: Learning, Memory, and

Cognition, 13, 36-44.

Zaragoza, M. S., & Mitchell, K. J. (1996). Related exposure to suggestion and the

creation of false memories. Psychological Science, 7, 294-300.

Table 1

Percentage of All Participants who Correctly Identified the Neutral Items during Pre-Group and Post-Group Tests on Experiment 1

Neutral Item	Individual Condition		Group Conditions	
	Pre-Group	Post-Group	Pre-Group	Post-Group
Customer's Name	83.3%	83.3%	84.4%	90.6%
Gun	95.0%	93.3%	94.4%	96.1%
Call	55.0%	58.3%	56.7%	88.3%
Direction	80.0%	73.3%	75.6%	79.4%
Address	55.0%	58.3%	51.7%	63.3%
Blouse	80.0%	83.3%	69.4%	68.9%
Pants	56.7%	46.7%	48.3%	45.6%
Shirt	73.3%	73.3%	67.2%	83.9%
Shoes	91.7%	96.7%	97.2%	100.0%
Tie	68.3%	63.3%	64.4%	66.1%
Height	36.7%	31.7%	48.9%	57.8%
Hands	41.7%	38.3%	51.1%	55.6%
Headband	90.0%	86.7%	81.1%	91.7%
Shoe Colour	71.7%	73.3%	79.4%	91.7%
Shots	85.0%	88.3%	83.3%	89.4%

Table 2

Percentage of Participants by Misled/Non-Misled and Groups/Individuals who

Incorrectly Endorsed the Misleading Items during Pre-Group and Post-Group Tests on

Experiment 1

	Misled Participants			
	Individual Condition		Group Conditions	
	Pre-Group	Post-Group	Pre-Group	Post-Group
Misleading Item				
Gold Watch	63.3%	53.3%	50.0%	41.1%
Gold Earring	70.0%	63.3%	53.3%	41.1%
'Empty'	70.0%	73.3%	66.7%	77.8%
Money	50.0%	53.3%	36.7%	21.1%
'Move' Back	26.7%	26.7%	24.4%	23.3%

	Non - Misled Participants			
	Individual Condition		Group Conditions	
	Pre-Group	Post-Group	Pre-Group	Post-Group
Misleading Item				
Gold Watch	10.0%	10.0%	20.0%	18.9%
Gold Earring	40.0%	23.3%	27.8%	21.1%
'Empty'	53.3%	43.3%	58.9%	63.3%
Money	10.0%	13.3%	17.8%	8.9%
'Move' Back	10.0%	23.3%	20.0%	28.9%

Table 3

Percentage of All Participants who Correctly Identified the Neutral Items during Pre-

Group and Post-Group Tests on Experiment 2

Neutral Item	Individual Condition		Group Conditions	
	Pre-Group	Post-Group	Pre-Group	Post-Group
Customer's Name	86.7%	86.7%	83.3%	92.5%
Gun	100.0%	100.0%	97.5%	97.5%
Call	53.3%	53.3%	68.9%	90.0%
Direction	83.3%	80.0%	70.8%	83.3%
Address	49.2%	52.5%	47.1%	65.0%
Blouse	80.0%	75.0%	82.5%	86.7%
Pants	50.8%	35.0%	37.8%	39.2%
Shirt	83.3%	86.7%	75.8%	85.0%
Shoes	98.3%	98.3%	97.5%	95.0%
Tie	68.3%	71.7%	63.3%	75.8%
Height	58.3%	58.3%	50.0%	50.0%
Hands	44.1%	43.3%	39.5%	54.2%
Headband	85.0%	85.0%	85.0%	92.5%
Shoe Colour	71.7%	78.3%	67.5%	87.5%

Table 4

Percentage of Participants by Misled/Non-Misled and Groups/Individuals who

Incorrectly Endorsed the Misleading Items during Pre-Group and Post-Group Tests on

Experiment 2

	Misled Participants			
	Individual Condition		Group Conditions	
	Pre-Group	Post-Group	Pre-Group	Post-Group
Misleading Item				
Tattoo	70.0%	53.3%	61.7%	28.3%
Gold Earring	76.7%	53.3%	83.1%	41.7%
Jump	36.7%	30.0%	28.3%	21.7%
Glasses	53.3%	40.0%	26.7%	8.3%
Cigarette	60.0%	46.7%	43.3%	16.7%
'Move' Back	50.0%	43.3%	40.0%	41.7%

	Non - Misled Participants			
	Individual Condition		Group Conditions	
	Pre-Group	Post-Group	Pre-Group	Post-Group
Misleading Item				
Tattoo	10.0%	20.0%	15.0%	8.3%
Gold Earring	26.7%	16.7%	30.0%	11.7%
Jump	0%	0%	0%	1.7%
Glasses	0%	0%	6.7%	1.7%
Cigarette	0%	0%	0%	0%
'Move' Back	31.0%	27.6%	31.7%	20.0%

Figure 1. Number of Misinformation Items Reported: Misinformation by Group Size
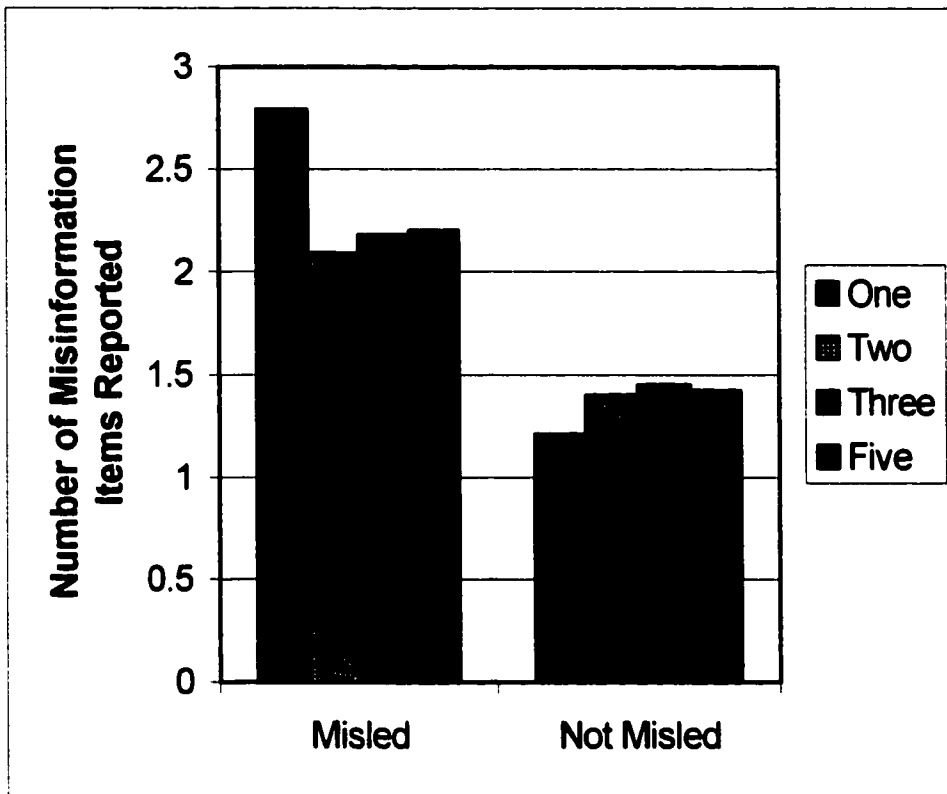
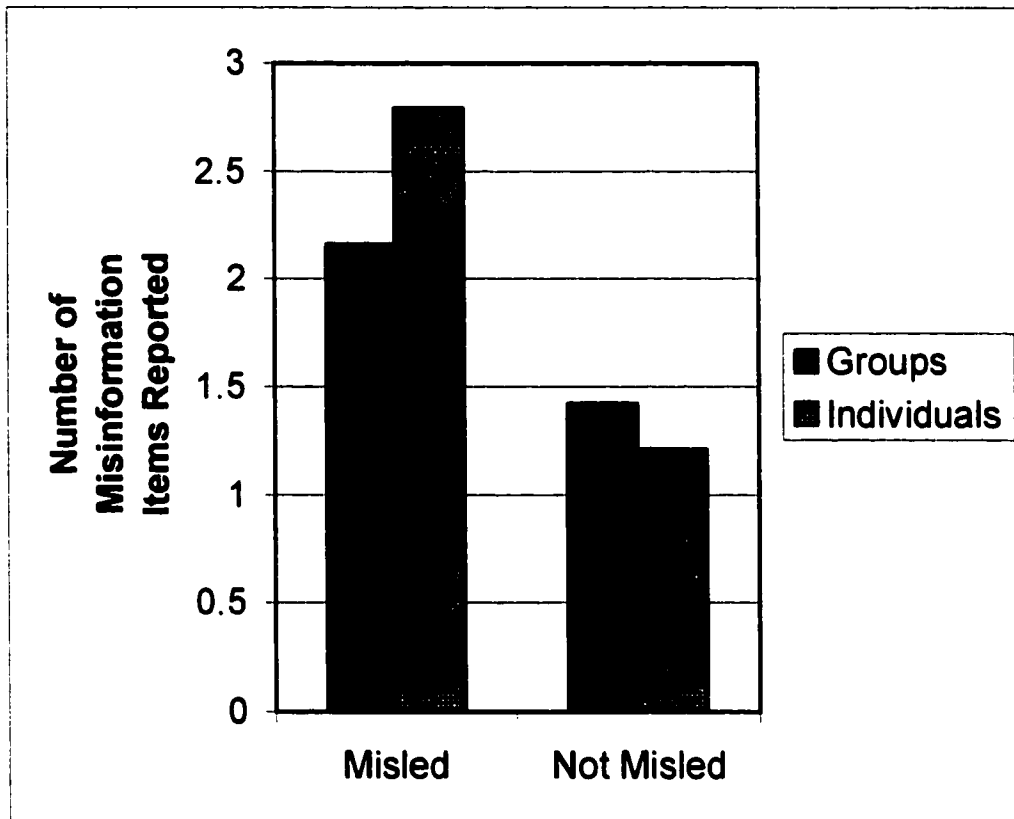Figure 2. Number of Misinformation Items Reported on Pre-Group and Post-Group Tests
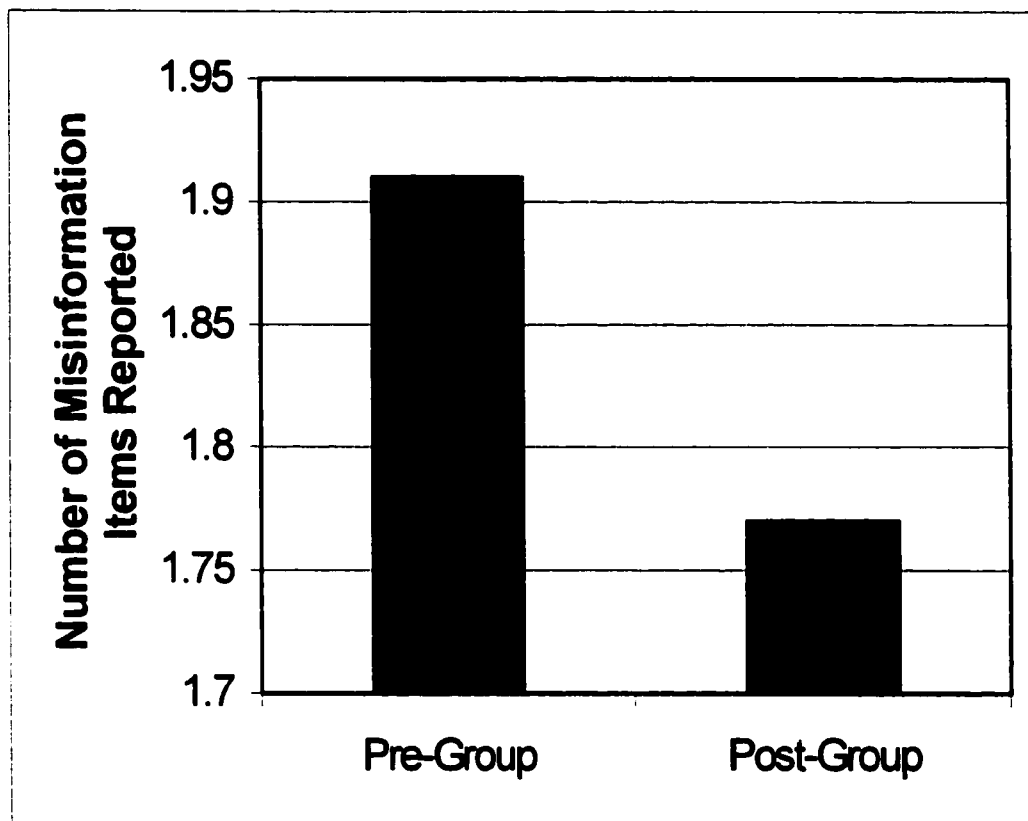
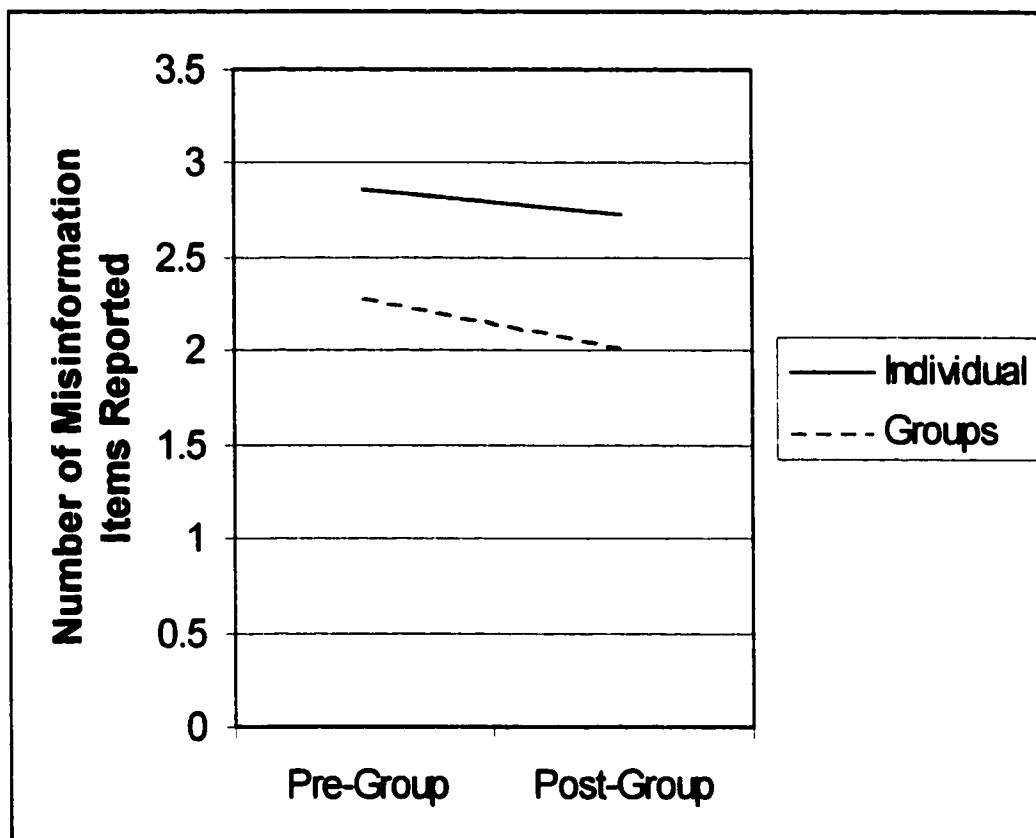Figure 3. Number of Misinformation Items Reported by Misled Participants:
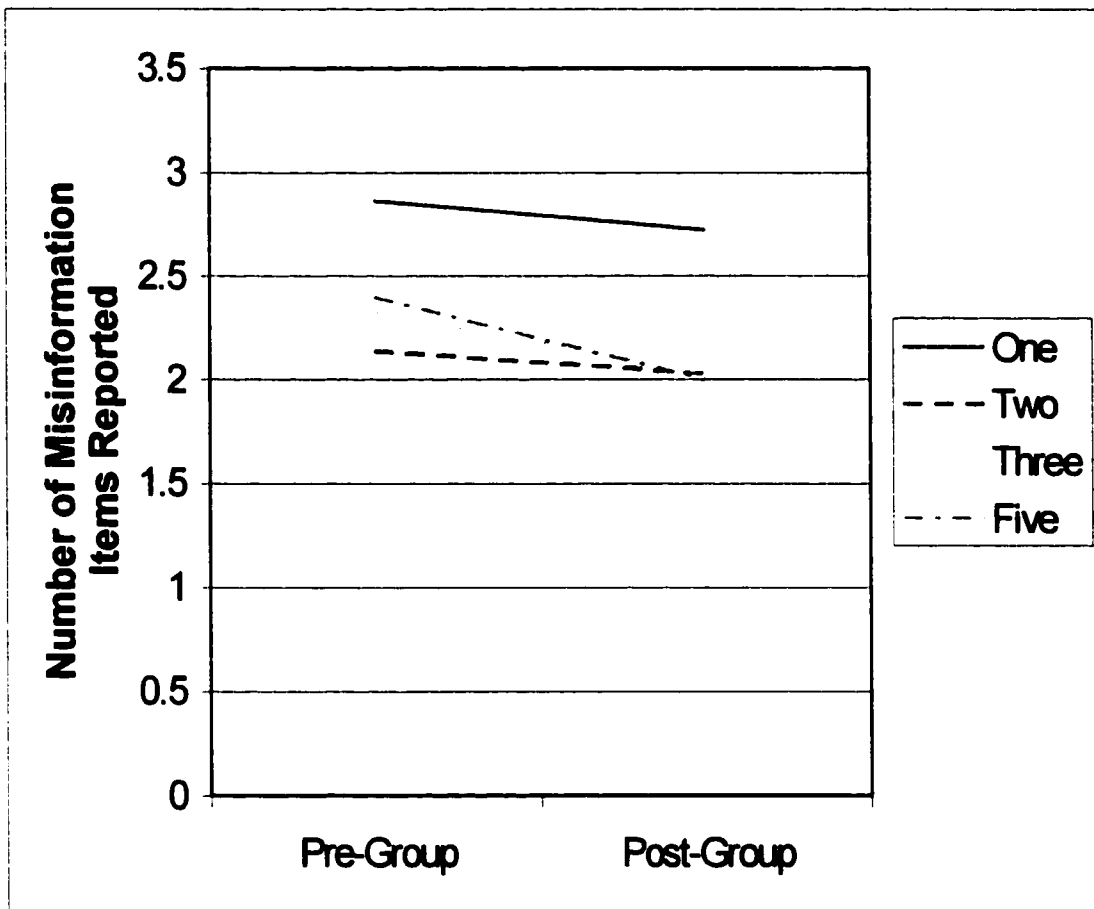
Group Size by Test

Figure 4. Number of Misinformation Items Reported: Misinformation by Groups

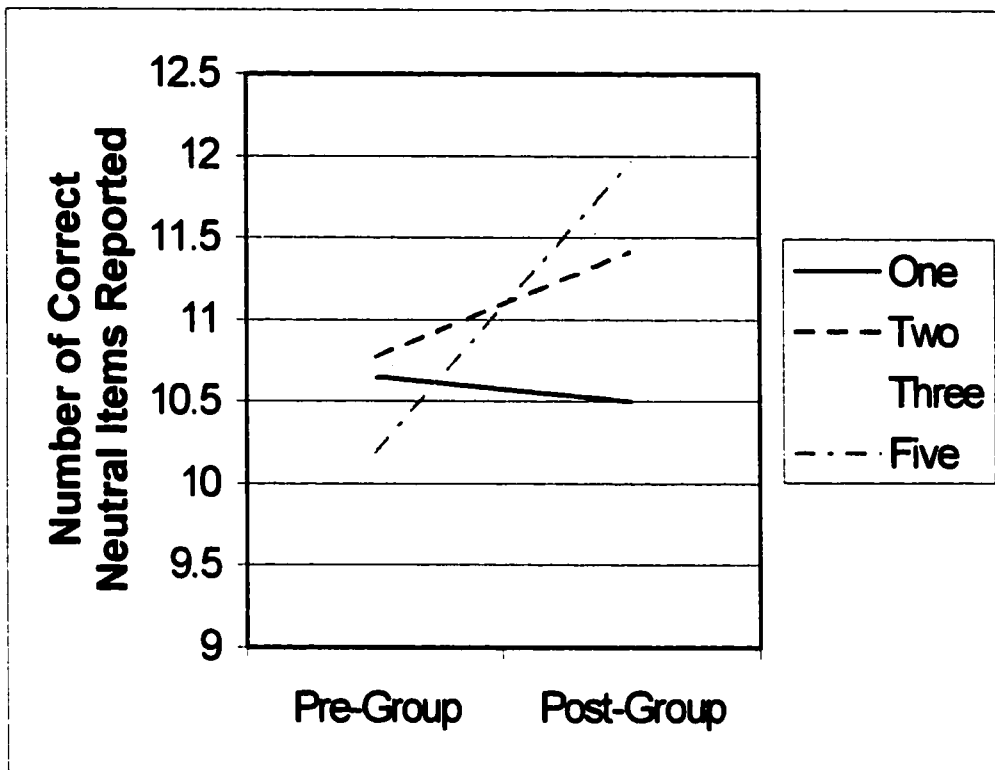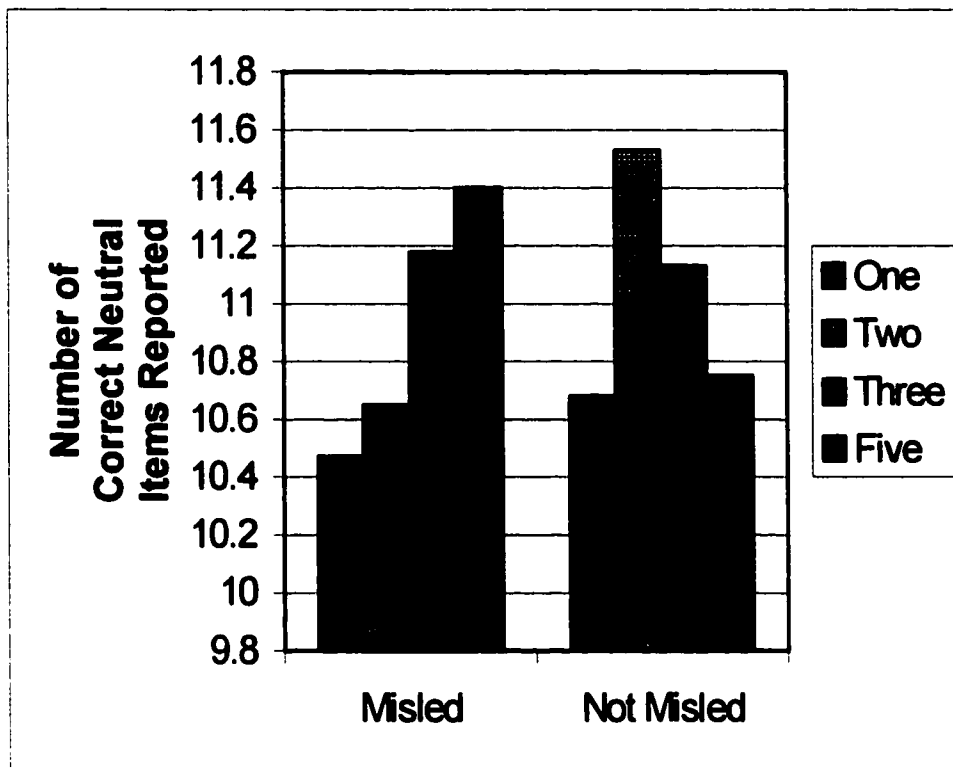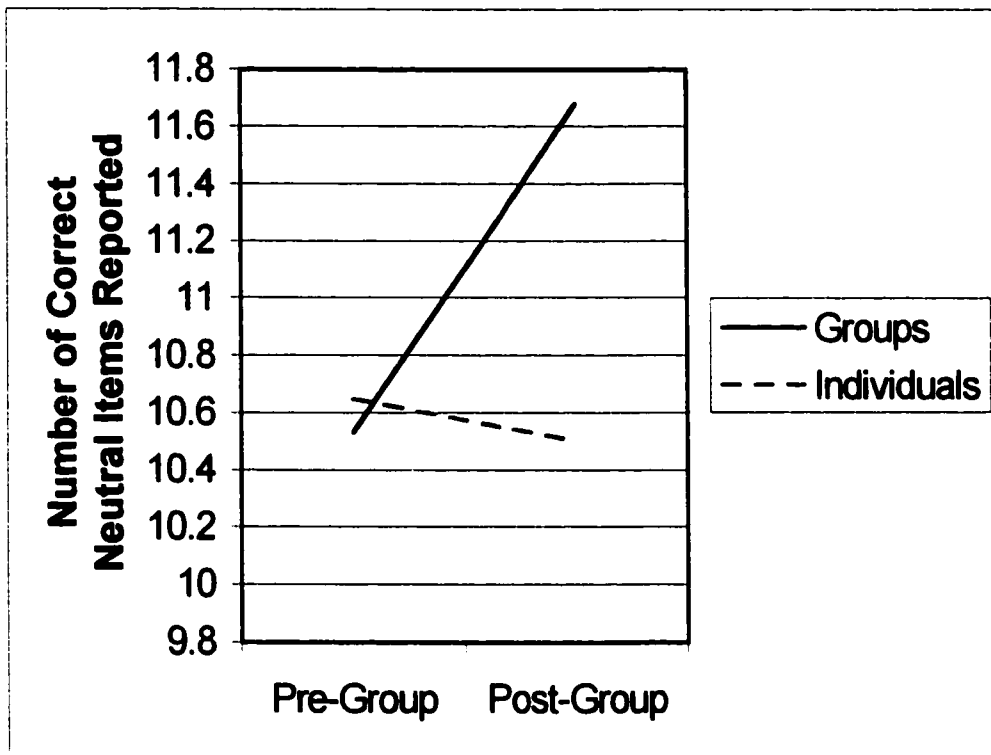Figure 5. Number of Misinformation Items Reported by Misled Participants:

Groups by Test

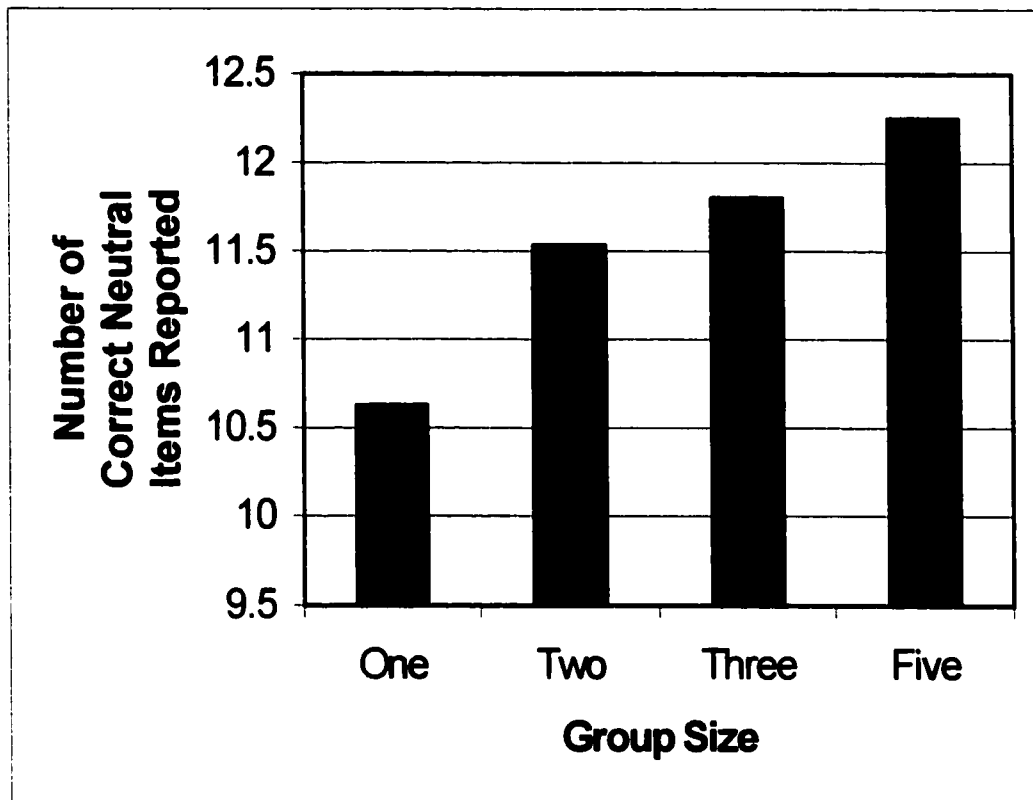Figure 6. Number of Correct Neutral Items Reported: Group Size by Test

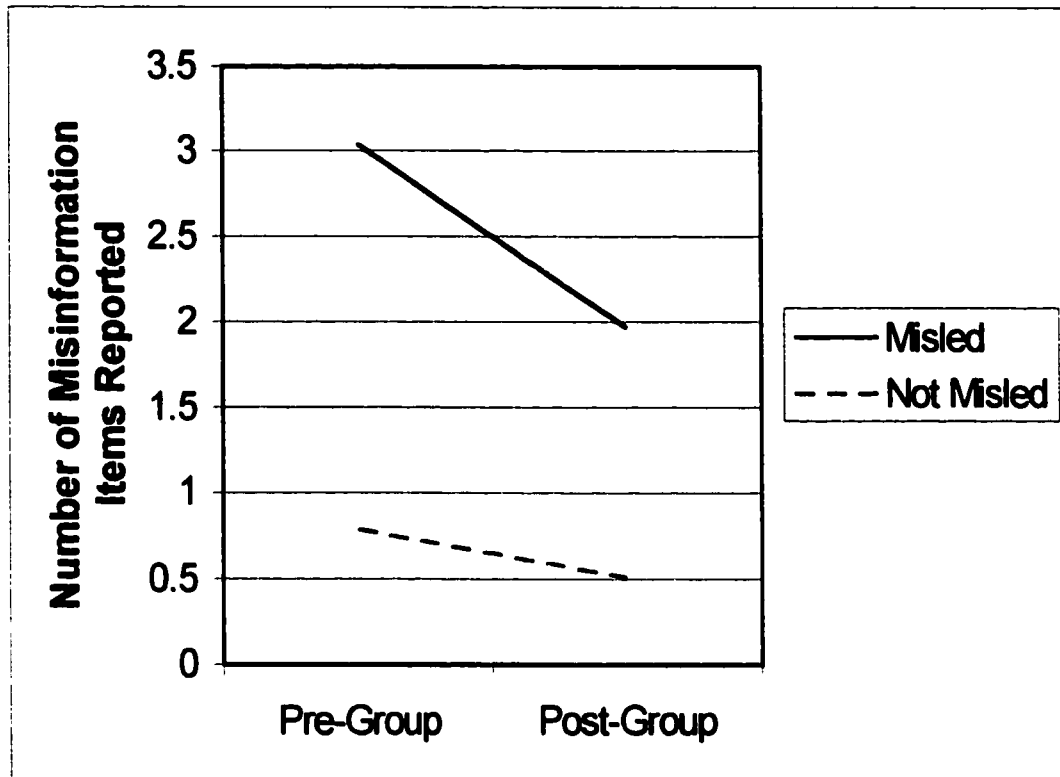Figure 7. Number of Correct Neutral Items Reported: Misinformation by Group Size

Figure 8. Number of Correct Neutral Items Reported: Groups by Test

Figure 9. Number of Correct Neutral Items Reported on Group Test

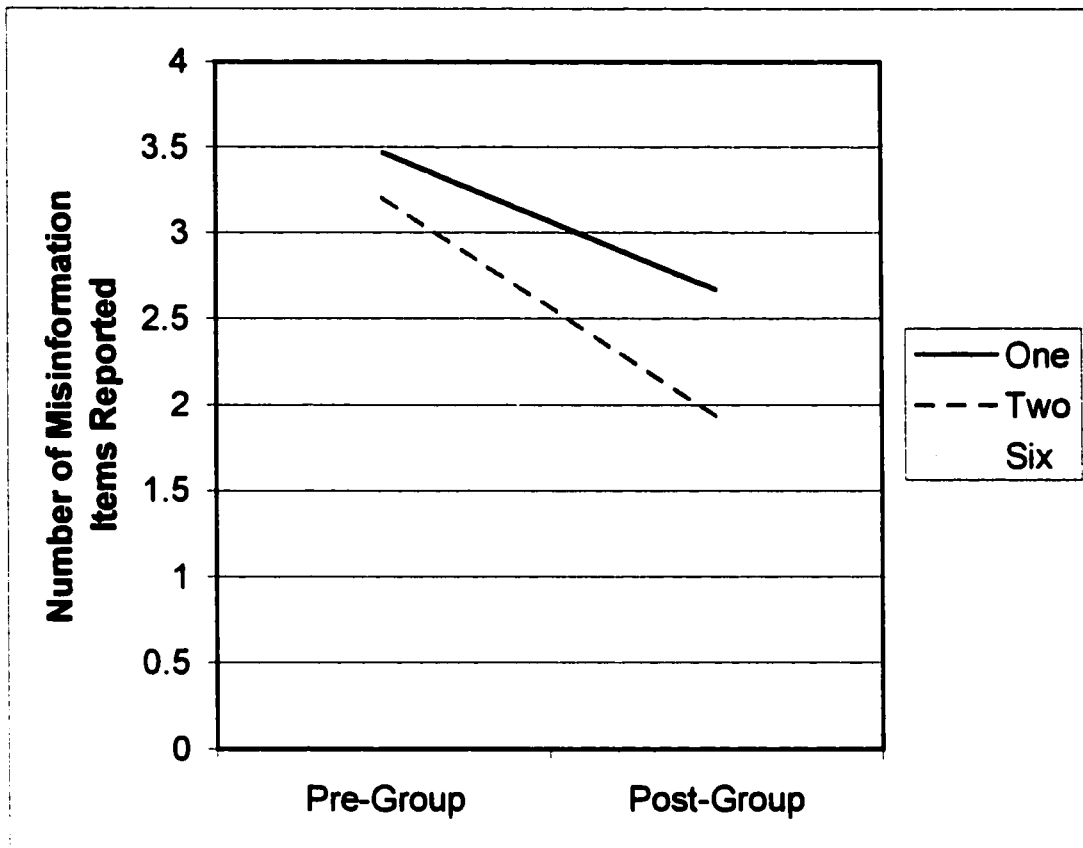Number of Correct Neutral Items Reported vs Group Size (One, Two, Three, Five)

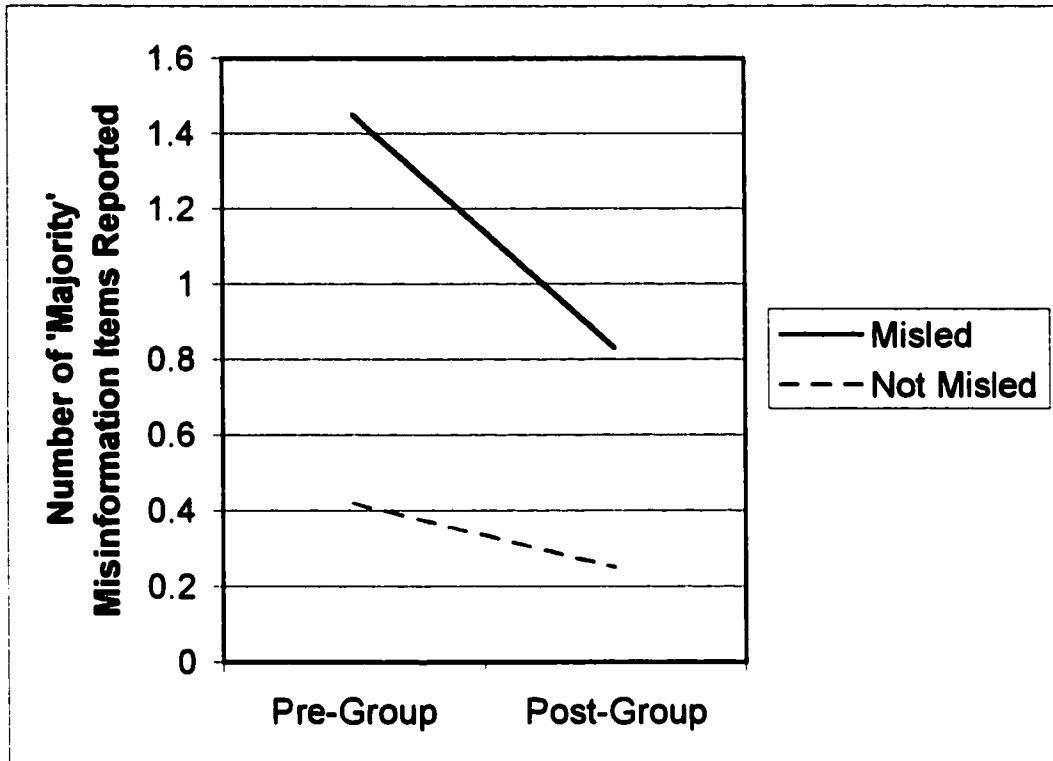Figure 10. Number of Misinformation Items Reported: Misinformation by Test

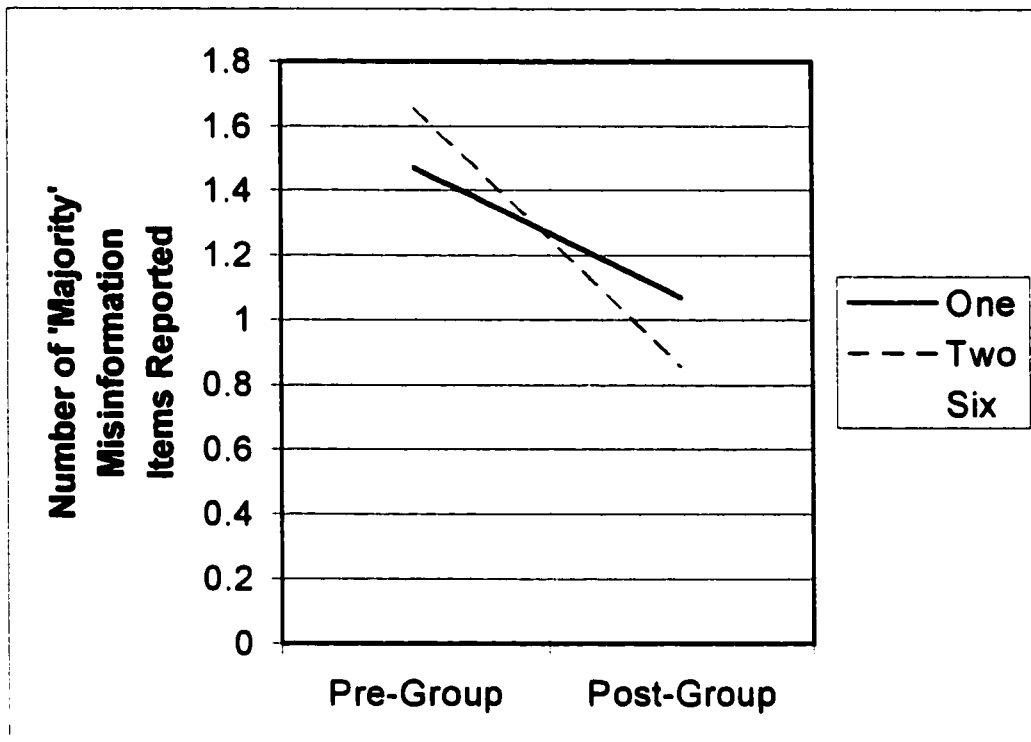Figure 11. Number of Misinformation Items Reported by Misled Participants: Group

Size by Test

Figure 12. Number of 'Majority' Misinformation Items Reported: Misinformation by Test

Figure 13. Number of 'Majority' Misinformation Items Reported by Misled Participants:

Group Size by Test

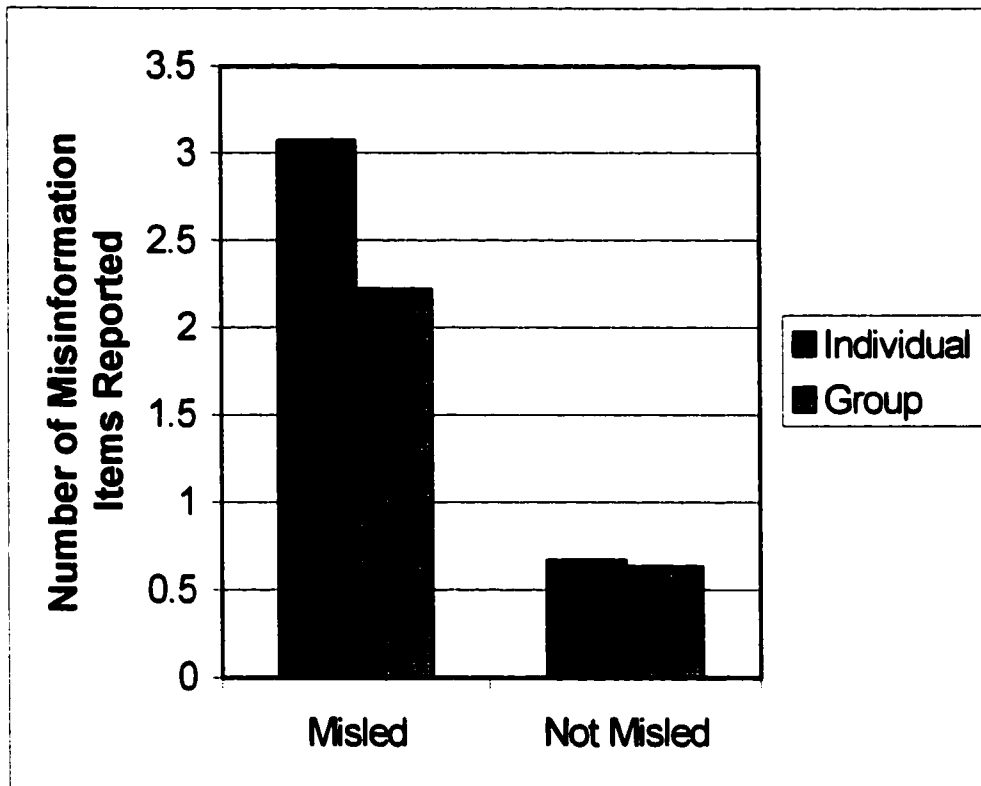Figure 14. Number of Misinformation Items Reported: Misinformation by Groups

Figure 15. Number of 'Minority' Misinformation Items Reported by Misled Participants:

Group Size by Test

Figure 16. Number of Misinformation Items Reported: Misinformation by Test
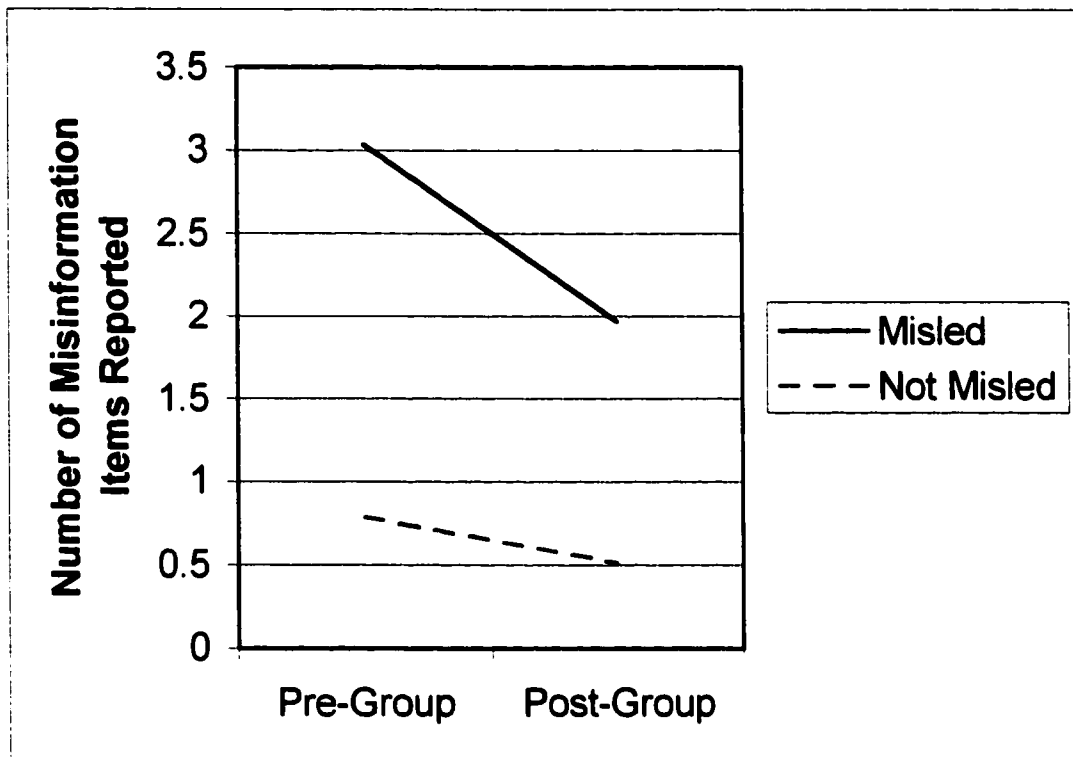
Figure 17. Number of Misinformation Items Reported by Misled Participants:
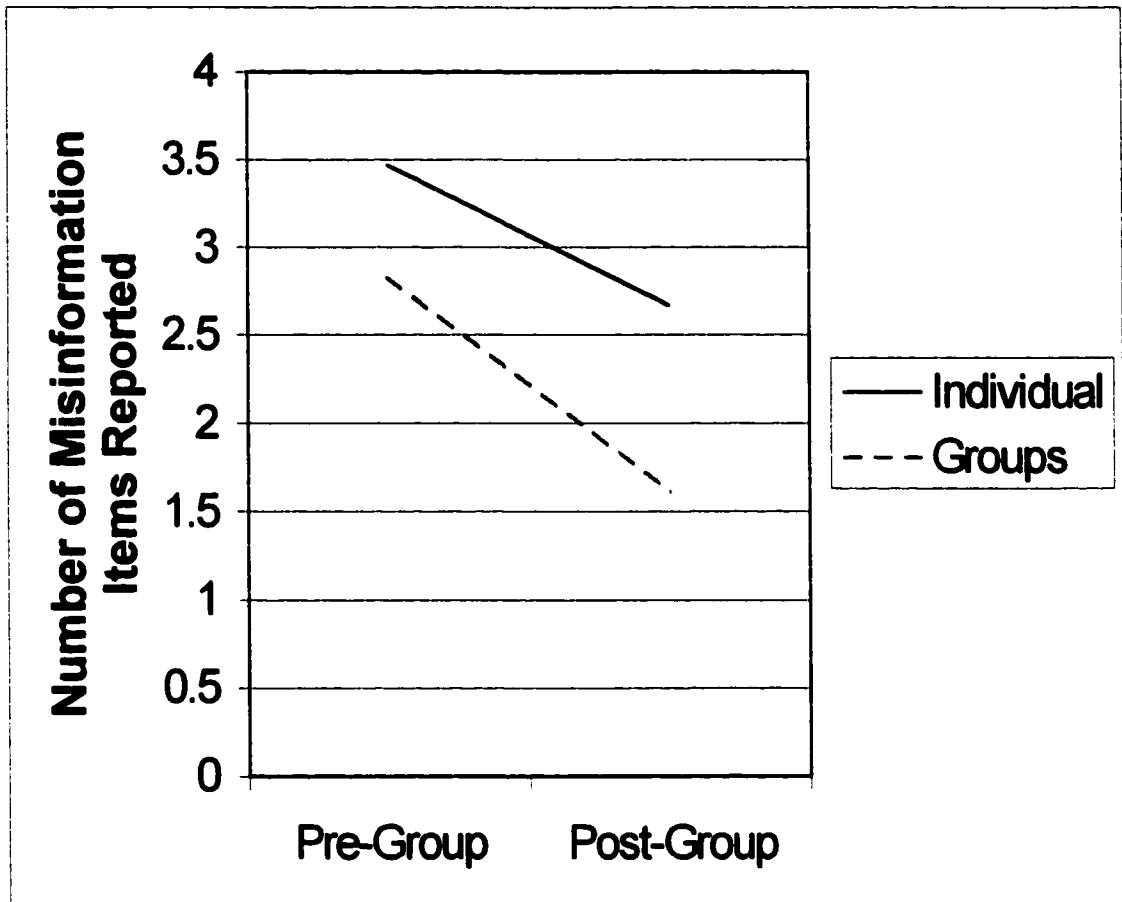
Groups by Test

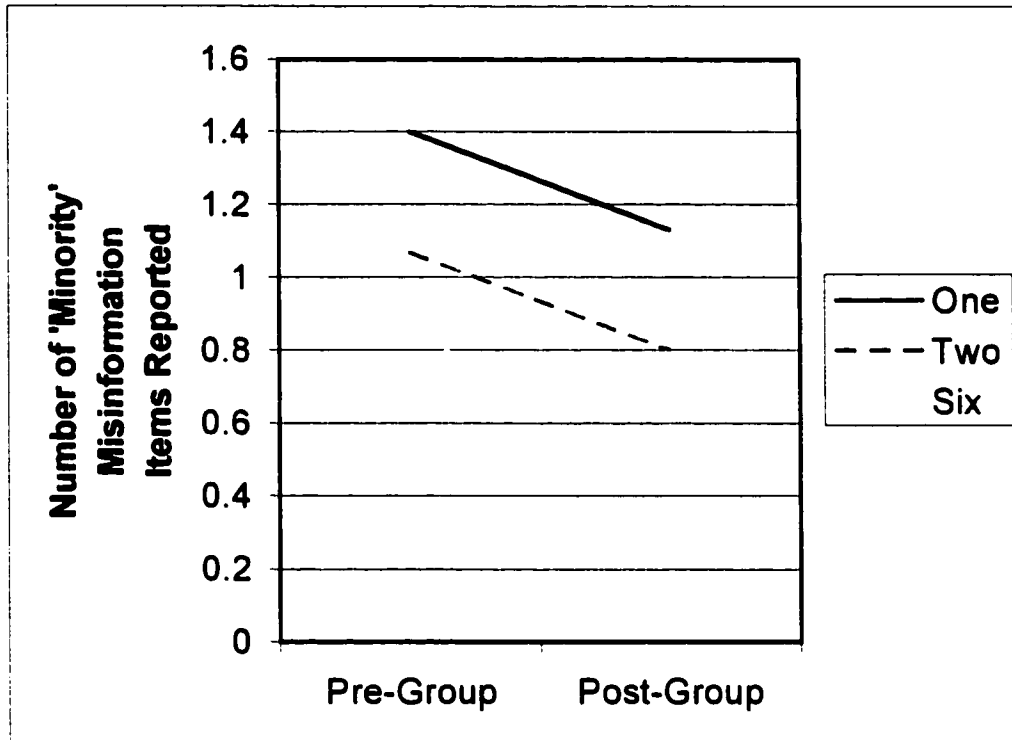Figure 18. Number of Correct Neutral Items Reported: Group Size by Test
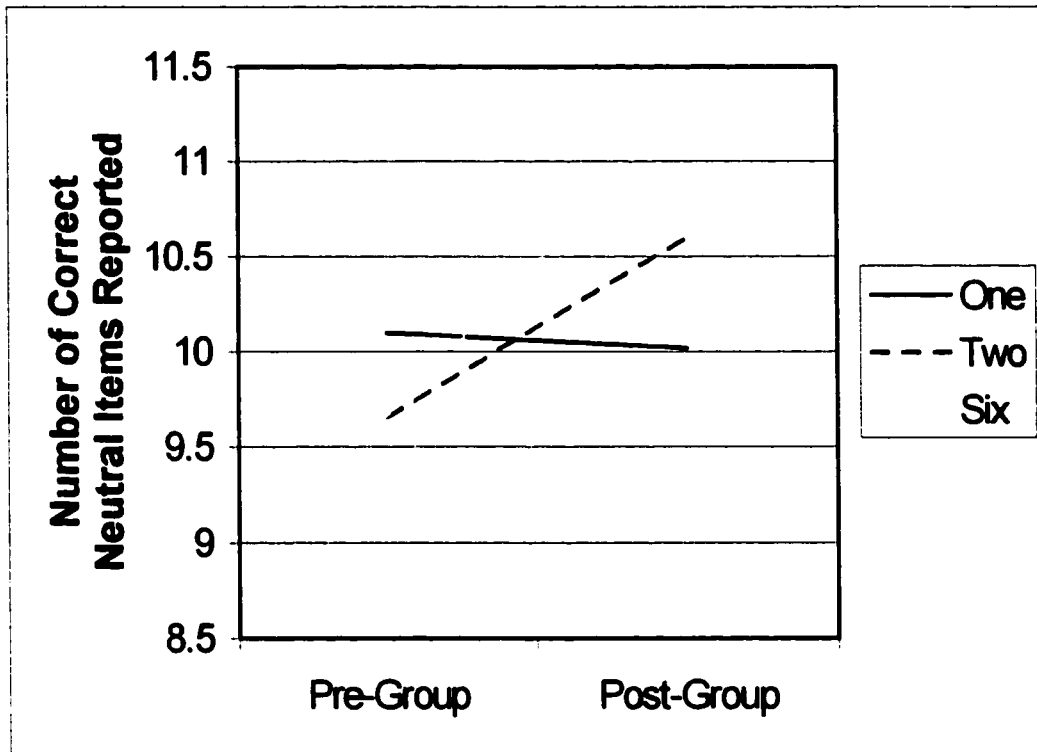
Figure 19. Number of Correct Neutral Items Reported: Groups by Test
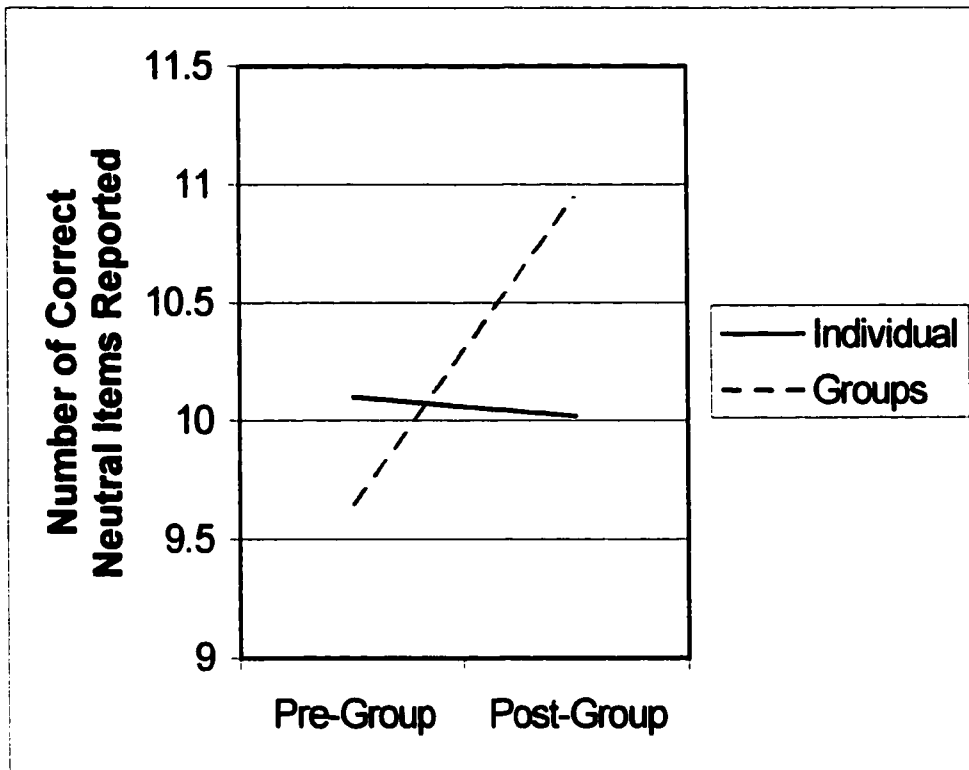
Figure 20. Length of Time in Store for Misled Participants: Group Size by Test
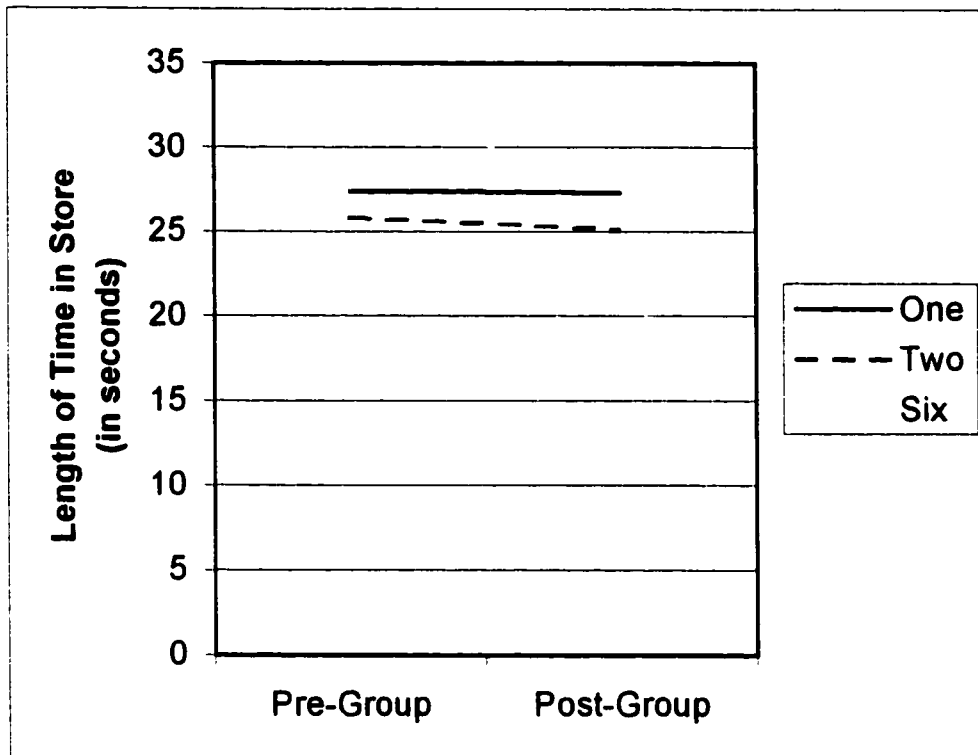
Figure 21. Length of Time in Store for Non-Misled Participants: Group Size by Test
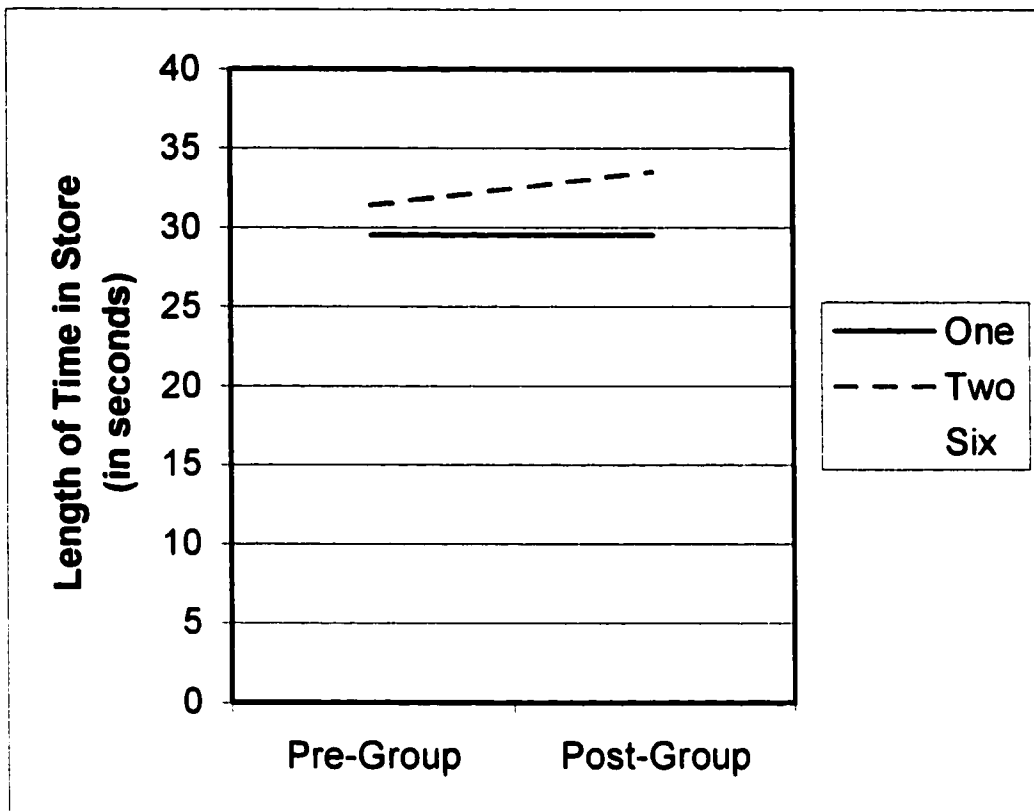
Figure 22. Ratings of Calmness/Nervousness: Group Size by Test
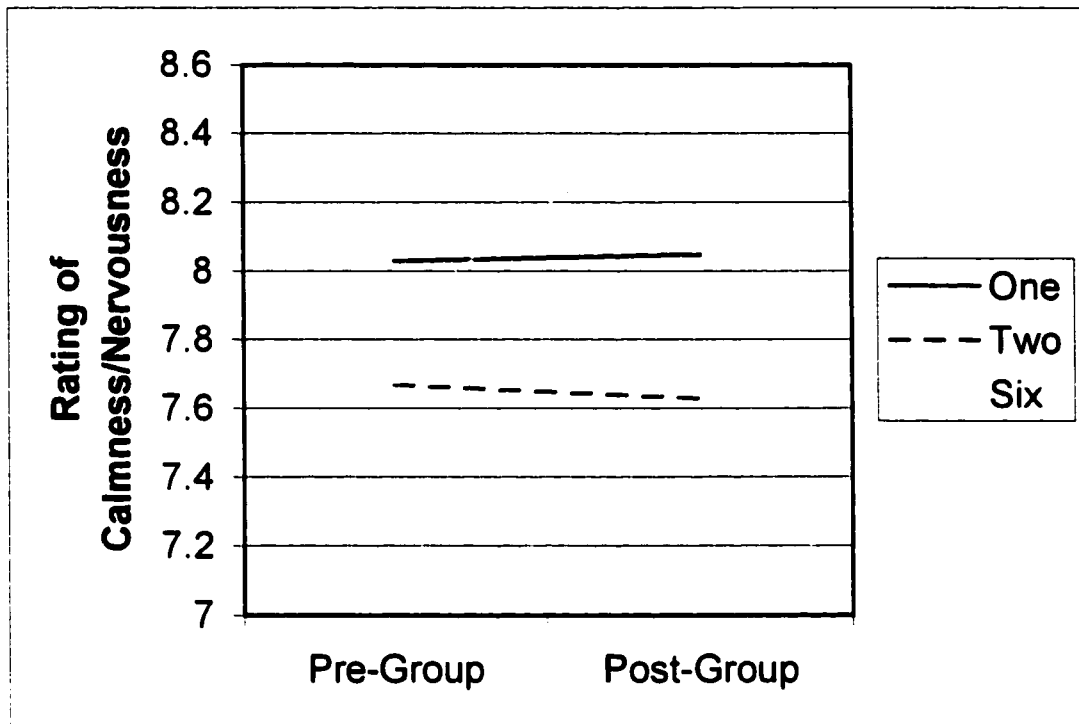
Figure 23. Number of Misinformation Items Reported on Open - Ended Test:

Misinformation by Group Size
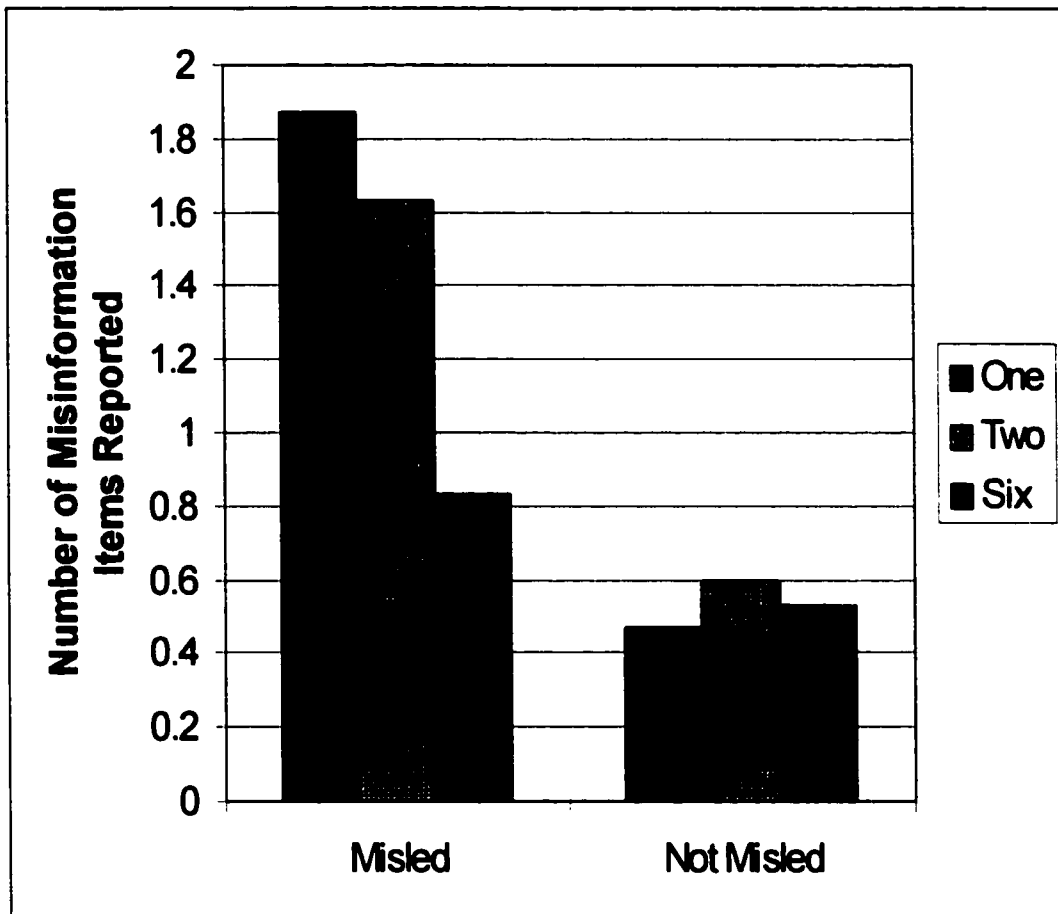
Appendix A
Wilfrid Laurier University Informed Consent
An investigation into eyewitness testimony
Study

We are asking for your participation in a research study which is being conducted by Matthew Cook, under the supervision of Dr. Max Gwynn, of the Psychology Department of Wilfrid Laurier University. This research study is being conducted as part of a graduate research course and subsequent Master's thesis research.

The purpose of this study is to better determine people's ability to recognize and recall details of a short video.

You will be presented with a simulated robbery and shooting video, and will then be requested to complete a recall questionnaire either as an individual or as a member of a group (i.e., multiple-choice and short answer questions) involving details of the video. You will also be requested to complete two short personality scales. This study will take approximately 45-60 minutes.

Your participation is voluntary and you may refuse to participate in this study without penalty. You may also withdraw from the study at any time without penalty or loss of benefits to which you would ordinarily be entitled. If you withdraw your data will be destroyed immediately following the session that you participated in. You may omit the answer to any question.

As a result of your participation in this study you will learn more about the processes of eyewitness memory, and the manner in which psychological research is conducted. You will also have the opportunity to have any questions answered concerning eyewitness testimony and memory.

Your research records will be kept confidential and you will not be identified in any publication or discussion. Your anonymous records will be stored in a locked room in the Department of Psychology.

Feedback on the overall results of this research will be posted on the bulletin board outside of the Psychology office at Wilfrid Laurier University by April 30, 2000.

If you have any questions about the research, the procedures employed, your rights, or any other research concerns you may contact the investigator or thesis supervisor as listed below, or Dr. Linda Parker, Chair of the Research Ethics Board, at ext. 3126.

This study has been reviewed by the University Research Ethics Board.

I acknowledge receiving a copy of this informed consent.

_____   _____
　　　　　Participant   Date

_____
　　　　　Investigator

Investigator: Matthew Cook   884-0710 ext. 2987
Supervisor: Dr. Max Gwynn   884-0710 ext. 3854

Appendix B
Marlowe-Crowne Social Desirability Scale

Listed below are a number of statements concerning personal attitudes and traits. Read each item and decide whether the statement is true or false as it pertains to you.

T F 1. Before voting I thoroughly investigate the qualifications of all candidates.

T F 2. I never hesitate to go out of my way to help someone in trouble.

T F 3. It is sometimes hard for me to go on with my work if I am not encouraged.

T F 4. I have never intensely disliked someone.

T F 5. On occasion I have had doubts about my ability to succeed in life.

T F 6. I sometimes feel resentful when I don't get my own way.

T F 7. I am always careful about my manner of dress.

T F 8. My table manners at home are as good as when I eat out in a restaurant.

T F 9. If I could get into a movie without paying for it and be sure I was not seen, I would probably do it.

T F 10. On a few occasions, I have given up doing something because I thought too little of my ability.

T F 11. I like to gossip at times.

T F 12. There have been times when I felt like rebelling against people in authority even though I knew they were right.

T F 13. No matter who I am talking to, I'm always a good listener.

T F 14. I can remember "playing sick" to get out of something.

T F 15. There have been occasions when I took advantage of someone.

T F 16. I'm always willing to admit when I made a mistake.

T F 17. I always try to practice what I preach.

T F 18. I don't find it particularly difficult to get along with loud-mouthed, obnoxious people.

T F 19. I sometimes try to get even, rather than forgive and forget.

T F 20. When I don't know something, I don't at all mind admitting it.

T F 21. I am always courteous, even to people who are disagreeable.

T F 22. At times I have really insisted on having things my own way.

T F 23. There have been occasions when I felt like smashing things.

T F 24. I would never think of letting someone else be punished for my wrongdoings.

T F 25. I never resent being asked to return a favour.

T F 26. I have never been irked when people expressed ideas very different from my own.

T F 27. I never make a long trip without checking the safety of my car.

T F 28. There have been times when I was quite jealous of the good fortune of others.

T F 29. I have almost never felt the urge to tell someone off.

T F 30. I am sometimes irritated by people who ask favours of me.

T F 31. I have never felt that I was punished without cause.

T F 32. I sometimes think when people have a misfortune they only got what they deserved.

T F 33. I have never deliberately said something that hurt someone's feelings.

Please do not turn the page until instructed to do so.

Appendix C

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by using the following scale. Do not return to earlier pages in the booklet at any time.

```
0-------1-------2-------3-------4-------5-------6-------7-------8-------9-------10
Not at all Confident        Somewhat Confident        Completely Confident
```

1.) What was the customer's name?
  Mr. Wallace   Mr. Walter   0-1-2-3-4-5-6-7-8-9-10

2.) From where did the offender take the gun?
  Bag   Waistband   0-1-2-3-4-5-6-7-8-9-10

3.) What hand was the offender's gold watch on? ***
  Left   Right   0-1-2-3-4-5-6-7-8-9-10

4.) Who did the cashier call after the shooting?
  Police   Operator   0-1-2-3-4-5-6-7-8-9-10

5.) Which direction did the offender go when he departed the store?
  Right   Left   0-1-2-3-4-5-6-7-8-9-10

6.) What was the address of the store?
  22 Bridge   22 Becker   0-1-2-3-4-5-6-7-8-9-10

7.) In which ear(s) did the offender wear the gold earring? ***
  Both   Left   0-1-2-3-4-5-6-7-8-9-10

8.) What colour was the cashier's blouse?
  Yellow   White   0-1-2-3-4-5-6-7-8-9-10

9.) What colour were the victim's pants?
  Black   Brown   0-1-2-3-4-5-6-7-8-9-10

10.) After saying "Empty the cash register", at whom did the offender point the gun? ***
  Customer   Cashier   0-1-2-3-4-5-6-7-8-9-10

11.) What colour was the offender's shirt?
  Grey   Black   0-1-2-3-4-5-6-7-8-9-10

12.) What type of shoes was the offender wearing?
  Loafers   Running shoes   0-1-2-3-4-5-6-7-8-9-10

13.) What colour tie was the victim wearing?
      Black   Navy   0-1-2-3-4-5-6-7-8-9-10

14.) After the offender took the money from the cash register, where did he put it? ***
      In his bag   In his waistband   0-1-2-3-4-5-6-7-8-9-10

15.) What was the approximate height of the offender (in feet and inches)?
      5'8"-5'10"   5'11"-6'   0-1-2-3-4-5-6-7-8-9-10

16.) In which hand(s) the offender hold the gun when he fired the shot(s)?
      Right   Both   0-1-2-3-4-5-6-7-8-9-10

17.) What colour was the offender's headband?
      Red & White   Orange & White   0-1-2-3-4-5-6-7-8-9-10

18.) After he said "Move back", what did the offender say to the customer? ***
      Shut up   Keep away   0-1-2-3-4-5-6-7-8-9-10

19.) What colour were the offender's shoes?
      Black   White   0-1-2-3-4-5-6-7-8-9-10

20.) How many shots were fired by the offender?
      One   Two   0-1-2-3-4-5-6-7-8-9-10

N. B. Note that *** indicates the five misleading items.

Please do not turn the page until instructed to do so.

Appendix D

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by using the following scale. Do not return to earlier pages in the booklet at any time.

```
0-------1-------2-------3-------4-------5-------6-------7-------8-------9-------10
```
Not at all Confident   Somewhat Confident   Completely Confident

1.) What was the customer's name?
    Mr. Wallace   Mr. Walter   0-1-2-3-4-5-6-7-8-9-10

2.) From where did the offender take the gun?
    Bag   Waistband   0-1-2-3-4-5-6-7-8-9-10

3.) What hand was the offender's bag in? ***
    Left   Right   0-1-2-3-4-5-6-7-8-9-10

4.) Who did the cashier call after the shooting?
    Police   Operator   0-1-2-3-4-5-6-7-8-9-10

5.) Which direction did the offender go when he departed the store?
    Right   Left   0-1-2-3-4-5-6-7-8-9-10

6.) What was the address of the store?
    22 Bridge   22 Becker   0-1-2-3-4-5-6-7-8-9-10

7.) With which hand(s) did the offender reach into his bag? ***
    Both   Left   0-1-2-3-4-5-6-7-8-9-10

8.) What colour was the cashier's blouse?
    Yellow   White   0-1-2-3-4-5-6-7-8-9-10

9.) What colour were the victim's pants?
    Black   Brown   0-1-2-3-4-5-6-7-8-9-10

10.) After yelling at the cashier, at whom did the offender point the gun? ***
    Customer   Cashier   0-1-2-3-4-5-6-7-8-9-10

11.) What colour was the offender's shirt?
    Grey   Black   0-1-2-3-4-5-6-7-8-9-10

12.) What type of shoes was the offender wearing?
    Loafers   Running shoes   0-1-2-3-4-5-6-7-8-9-10

13.) What colour tie was the victim wearing?

        Black   Navy   0-1-2-3-4-5-6-7-8-9-10

14.) Where did the offender keep his cigarettes? ***

        In his bag   In his waistband   0-1-2-3-4-5-6-7-8-9-10

15.) What was the approximate height of the offender (in feet and inches)?

        5'8"-5'10"   5'11"-6'   0-1-2-3-4-5-6-7-8-9-10

16.) In which hand(s) the offender hold the gun when he fired the shot(s)?

        Right   Both   0-1-2-3-4-5-6-7-8-9-10

17.) What colour was the offender's headband?

        Red & White   Orange & White   0-1-2-3-4-5-6-7-8-9-10

18.) After yelling at the customer, what did the offender say to him? ***

        Shut up   Keep away   0-1-2-3-4-5-6-7-8-9-10

19.) What colour were the offender's shoes?

        Black   White   0-1-2-3-4-5-6-7-8-9-10

20.) How many shots were fired by the offender?

        One   Two   0-1-2-3-4-5-6-7-8-9-10

N. B. Note that *** indicates the five non-misleading items.

Please do not turn the page until instructed to do so.

Appendix E

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by using the following scale. Do not return to earlier pages in the booklet at any time.

```
0-------1-------2-------3-------4-------5-------6-------7-------8-------9-------10
Not at all Confident        Somewhat Confident        Completely Confident
```

1.) What colour were the offender's pants?
   Black   Blue   0-1-2-3-4-5-6-7-8-9-10

2.) Was the offender wearing a gold watch?
   Yes   No   0-1-2-3-4-5-6-7-8-9-10

3.) Was the offender wearing an earring?
   Yes   No   0-1-2-3-4-5-6-7-8-9-10

4.) What colour was the offender's hair?
   Brown   Black   0-1-2-3-4-5-6-7-8-9-10

5.) What colour were the offender's shoes?
   Black   White   0-1-2-3-4-5-6-7-8-9-10

6.) Did the offender use the exact words "Open the cash register" or "Empty the cash register"?
   Open...   Empty...   0-1-2-3-4-5-6-7-8-9-10

7.) Did the offender's shirt have anything on the back?
   Nothing   Words   0-1-2-3-4-5-6-7-8-9-10

8.) How much money did the offender take from the cash register?
   None   Small stack of bills   0-1-2-3-4-5-6-7-8-9-10

9.) What was the offender wearing around his neck?
   Silver chain   White beads   0-1-2-3-4-5-6-7-8-9-10

10.) Did the offender use the exact words "Shut up" or "Move back" while yelling at the customer?
   Move back   Shut up   0-1-2-3-4-5-6-7-8-9-10

Please do not turn the page until instructed to do so.

APPENDIX F
Self-Monitoring Scale

The following statements concern your personal reactions to a number of different situations. No two statements are exactly alike, so consider each statement carefully before answering. If a statement is TRUE or MOSTLY TRUE as applied to you, circle the T beside the statement. If a statement is FALSE or NOT USUALLY TRUE as applied to you, circle the F beside the statement. It is important that you answer as truthfully and as honestly as you can. Your answers will be kept in the strictest confidence.

1.	T F	I find it hard to imitate the behaviour of other people.
2.	T F	My behaviour is usually an expression of my true inner feelings, attitudes and beliefs.
3.	T F	At parties and social gatherings, I do not attempt to do things or say things that others will like.
4.	T F	I can only argue for ideas which I already believe.
5.	T F	I can make impromptu speeches even on topics about which I have almost no information.
6.	T F	I guess I put on a show to impress or entertain people.
7.	T F	When I am uncertain how to act in a social situation, I look to the behaviour of others for cues.
8.	T F	I would probably make a good actor.
9.	T F	I rarely need the advice of my friends to choose movies, books or music.
10.	T F	I sometimes appear to others to be experiencing deeper emotions than I actually am.
11.	T F	I laugh more when I watch a comedy with others than when alone.
12.	T F	In a group of people I am rarely the centre of attention.
13.	T F	In different situations and with different people, I often act like very different persons.
14.	T F	I am not particularly good at making people like me.
15.	T F	Even if I am not enjoying myself, I often pretend to be having a good time.
16.	T F	I'm not always the person I appear to be.
17.	T F	I would not change my opinions (or the way I do things) in order to please someone else or win their favour.
18.	T F	I have considered being an entertainer.
19.	T F	In order to get along and be liked, I tend to be what people expect me to be rather than anything else.
20.	T F	I have never been good at games like charades or improvisational acting.
21.	T F	I have trouble changing my behaviour to suit different people and different situations.
22.	T F	I feel a bit awkward in company and do not show up quite as well as I should.
23.	T F	At a party I let others keep the jokes and stories going.
24.	T F	I can look anyone in the eye and tell a lie with a straight face (if for a right end).
25.	T F	I may deceive people by being friendly when I really dislike them.

Please do not turn the page until instructed to do so.

Appendix G

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by using the following scale. Do not return to earlier pages in the booklet at any time.

```
0-------1-------2-------3-------4-------5-------6-------7-------8-------9-------10
Not at all Confident          Somewhat Confident          Completely Confident
```

1.) What was the customer's name?

      Mr. Wallace   Mr. Walter   0-1-2-3-4-5-6-7-8-9-10

2.) From where did the offender take the gun?

      Bag   Waistband   0-1-2-3-4-5-6-7-8-9-10

3.) Was the offender wearing a gold watch?

      Yes   No   0-1-2-3-4-5-6-7-8-9-10

4.) Who did the cashier call after the shooting?

      Police   Operator   0-1-2-3-4-5-6-7-8-9-10

5.) Which direction did the offender go when he departed the store?

      Right   Left   0-1-2-3-4-5-6-7-8-9-10

6.) What was the address of the store?

      22 Bridge   22 Becker   0-1-2-3-4-5-6-7-8-9-10

7.) Was the offender wearing an earring?

      Yes   No   0-1-2-3-4-5-6-7-8-9-10

8.) What colour was the cashier's blouse?

      Yellow   White   0-1-2-3-4-5-6-7-8-9-10

9.) What colour were the victim's pants?

      Black   Brown   0-1-2-3-4-5-6-7-8-9-10

10.) Did the offender use the exact words "Open the cash register" or "Empty the cash register?

      Open...   Empty...   0-1-2-3-4-5-6-7-8-9-10

11.) What colour was the offender's shirt?

      Grey   Black   0-1-2-3-4-5-6-7-8-9-10

12.) What type of shoes was the offender wearing?

      Loafers   Running shoes   0-1-2-3-4-5-6-7-8-9-10

13.) What colour tie was the victim wearing?
     Black   Navy   0-1-2-3-4-5-6-7-8-9-10

14.) How much money did the offender take from the cash register?
     None   Small stack of bills   0-1-2-3-4-5-6-7-8-9-10

15.) What was the approximate height of the offender (in feet and inches)?
     5'8"-5'10"   5'11"-6'   0-1-2-3-4-5-6-7-8-9-10

16.) In which hand(s) the offender hold the gun when he fired the shot(s)?
     Right   Both   0-1-2-3-4-5-6-7-8-9-10

17.) What colour was the offender's headband?
     Red & White   Orange & White   0-1-2-3-4-5-6-7-8-9-10

18.) Did the offender use the exact words "Shut up" or "Move back" while yelling at the customer?
     Move back   Shut up   0-1-2-3-4-5-6-7-8-9-10

19.) What colour were the offender's shoes?
     Black   White   0-1-2-3-4-5-6-7-8-9-10

20.) How many shots were fired by the offender?
     One   Two   0-1-2-3-4-5-6-7-8-9-10

Please do not turn the page until instructed to do so.

Appendix H

Listed below are a number of first names. Your task is to fill in a last name of a famous person e.g., John <u>Wayne</u>. Please complete as many as you can, and just leave the name blank if you cannot think of a famous person.

John	Mary	Wayne
Matt	Cindy	Julia
Robert	Mario	Courtney
Monica	Steffi	Michael
Jennifer	Brett	Lisa
Duane	Melanie	Shannon
Pamela	Steve	Andrew
Erika	Geoff	Scott
Tara	Laura	Les
Carol	Max	Brooke
Elizabeth	Philip	Jean
Charles	Margaret	Natasha
Kevin	Alexandra	Eric
Samantha	Cherie	Ty
Veronica	Janet	Linda
Richard	Sarah	Sandra
Britney	Zachary	Christina
Vicky	Bill	Enrique
Charles	Sophie	Robyn
Garth	Shania	Natalie
Mark	Beth	Ian
Amy	Brent	Wendy
Kim	Rick	Tiger
Helen	Dale	Jason
Pete	Martina	Lindsay
Andre	Emily	Cheryl
Paulina	Elvis	Jack
David	Sadie	Trish
Stacey	Ron	Krista
Dorian	Tracy	Earvin
Rena	Paul	Shawn
Ken	Lena	Jenny
Luke	Kelsey	Ryan
Arnold	Rachel	Chantel
Julie	Mariah	Guy
Fred	Wilma	Ernie
Madonna	Kirk	Marty

Please do not turn the page until instructed to do so.

Appendix I

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by using the following scale. Do not return to earlier pages in the booklet at any time.

```
0-------1-------2-------3-------4-------5-------6-------7-------8-------9-------10
Not at all Confident         Somewhat Confident         Completely Confident
```

1.) What was the customer's name?
    Mr. Wallace   Mr. Walter   0-1-2-3-4-5-6-7-8-9-10

2.) From where did the offender take the gun?
    Bag   Waistband   0-1-2-3-4-5-6-7-8-9-10

3.) Was the offender wearing a gold watch?
    Yes   No   0-1-2-3-4-5-6-7-8-9-10

4.) Who did the cashier call after the shooting?
    Police   Operator   0-1-2-3-4-5-6-7-8-9-10

5.) Which direction did the offender go when he departed the store?
    Right   Left   0-1-2-3-4-5-6-7-8-9-10

6.) What was the address of the store?
    22 Bridge   22 Becker   0-1-2-3-4-5-6-7-8-9-10

7.) Was the offender wearing an earring?
    Yes   No   0-1-2-3-4-5-6-7-8-9-10

8.) What colour was the cashier's blouse?
    Yellow   White   0-1-2-3-4-5-6-7-8-9-10

9.) What colour were the victim's pants?
    Black   Brown   0-1-2-3-4-5-6-7-8-9-10

10.) Did the offender use the exact words "Open the cash register" or "Empty the cash register?
    Open...   Empty...   0-1-2-3-4-5-6-7-8-9-10

11.) What colour was the offender's shirt?
    Grey   Black   0-1-2-3-4-5-6-7-8-9-10

12.) What type of shoes was the offender wearing?
    Loafers   Running shoes   0-1-2-3-4-5-6-7-8-9-10

13.) What colour tie was the victim wearing?
        Black   Navy   0-1-2-3-4-5-6-7-8-9-10

14.) How much money did the offender take from the cash register?
        None   Small stack of bills   0-1-2-3-4-5-6-7-8-9-10

15.) What was the approximate height of the offender (in feet and inches)?
        5'8"-5'10"   5'11"-6'   0-1-2-3-4-5-6-7-8-9-10

16.) In which hand(s) the offender hold the gun when he fired the shot(s)?
        Right   Both   0-1-2-3-4-5-6-7-8-9-10

17.) What colour was the offender's headband?
        Red & White   Orange & White   0-1-2-3-4-5-6-7-8-9-10

18.) Did the offender use the exact words "Shut up" or "Move back" while yelling at the customer?
        Move back   Shut up   0-1-2-3-4-5-6-7-8-9-10

19.) What colour were the offender's shoes?
        Black   White   0-1-2-3-4-5-6-7-8-9-10

20.) How many shots were fired by the offender?
        One   Two   0-1-2-3-4-5-6-7-8-9-10

Please do not turn the page until instructed to do so.

Appendix J

Without going back to previous pages, please describe, in point form:

a.) the offender's jewelry (i.e., earrings, necklace, watch, rings, etc., including colour for each item)

b.) the offender's actions with respect to handling money from the cash register

c.) what the offender said to the cashier, using exact wording where possible (except for swear words)

d.) what the offender said to the customer, using exact wording where possible (except for swear words)

Please do not turn the page until instructed to do so.

Appendix K

We are interested in your opinions concerning this research. In your own words briefly describe what you believe were the main purposes of this study.

Please do not turn the page until instructed to do so.

Appendix L

Please respond to the following question by circling the most appropriate number on the scale as it applies to you. To what extent did you feel influenced to provide answers that you believed were incorrect while in your group?

0-------1-------2-------3-------4-------5-------6-------7-------8-------9-------10

Not at all influenced   Somewhat influenced   Greatly Influenced

Appendix M
Information about this study
An investigation into eyewitness testimony
Study #

First of all I would like to thank you for your participation in this study. This experiment was conducted to assess the impact of group discussion on the recall of eyewitnesses. Previous research studies have found a phenomenon called the misinformation effect in which participants include incorrect information that they have been exposed to into their subsequent recall of the details and events of a crime. Past studies investigating the effects of group discussion on eyewitness testimony have found that, under some conditions, groups recall more accurate information than individuals, while at other times there are no differences in recall accuracy between groups and individuals.

This study was designed to determine the impact of group discussion and the presence of misinformation on eyewitness recall.

All participants viewed the same video and subsequently completed the same personality questionnaires. However, half of the participants then received misleading information (e.g., that the offender was wearing an earring) on the first questionnaire, whereas the other participants did not receive this misleading information. As well, participants completed a second recognition test either individually or as a member of a group of three, four, or five. This manipulation was performed in order to determine the effect of group discussion on eyewitness memory. Confidence ratings were also assessed on some questionnaires as previous studies have shown that a person's confidence level is not indicative of the correctness of his/her answer.

You should not be concerned if, while attempting to recall the details of the video, you may have partially relied on what you were told other participants had said. Memory is not perfect, and no one can remember every small detail. Quite often in a real eyewitness situation we may hear descriptions from other people which may in turn shape our own subsequent memory and descriptions. This is a natural and usually beneficial way of sorting through what may be vague memories of details of a complicated event.

For specific articles regarding eyewitness memory and group discussion effects on eyewitness testimony you may consult:

Loftus, E. F. (1992). When a lie becomes memory's truth: Memory distortion after exposure to misinformation. Current Directions in Psychological Science, 1, 121-123., and

Yarmey, A. D., & Morris, S. (1998). The effects of discussion on eyewitness memory. Journal of Applied Social Psychology, 28, 1637-1648.

More information regarding eyewitness recall and testimony may be found in the Psychology 100 textbook: 2nd Canadian Edition, by Baron, Earhard, and Ozier (1999), on pages 250-251.

You may read a short summary of the results of this study which will be posted on the bulletin board outside the Psychology Office by April 30, 2000.

If you have any questions or concerns regarding this study you may contact the researcher, Matthew Cook, by telephone at 884-0710 ext. 2987 or by e-mail at cook6280@mach1.wlu.ca. The thesis supervisor, Dr. Max Gwynn, may be contacted by telephone at 884-0710 ext.3854 or by e-mail at mgwynn@wlu.ca.

Once again thank you very much for your participation.

Appendix N
Wilfrid Laurier University Informed Consent
An investigation into eyewitness testimony
Study #

We are asking for your participation in a research study which is being conducted by Matthew Cook, under the supervision of Dr. Max Gwynn, of the Psychology Department of Wilfrid Laurier University. This research study is being conducted as part of a graduate student course and subsequent Master's thesis research.

The purpose of this study is to better determine people's ability to recognize and recall details of a short video.

You will be presented with a simulated robbery and shooting video, and will then be requested to complete a recall questionnaire (i.e., multiple-choice and short answer questions) involving details of the video either as an individual or as a member of a small group (2-6 people). You will also be requested to complete two short personality scales (one which measures desire for control and one which measures self-monitoring). This study will take approximately 45-60 minutes and be worth one participation credit.

Your participation is voluntary and you may refuse to participate in this study without penalty. You may also withdraw from the study at any time without penalty or loss of benefits to which you would ordinarily be entitled. If you withdraw your data will be destroyed immediately following the session that you participated in. You may omit the answer to any question.

As a result of your participation in this study you will learn more about the processes of eyewitness memory, and the manner in which psychological research is conducted. You will also have the opportunity to have any questions answered concerning eyewitness testimony and memory.

Your research records will be kept confidential and you will not be identified in any publication or discussion. Your anonymous records will be stored in a locked room in the Department of Psychology.

Feedback on the overall results of this research will be posted on the bulletin board outside of the Psychology office at Wilfrid Laurier University by April 7, 2001.

If you have any questions about the research, the procedures employed, your rights, or any other research concerns you may contact the investigator or thesis supervisor as listed below, or Dr. Bruce Arai, Chair of the Research Ethics Board, at ext. 3753.

This study has been reviewed by the University Research Ethics Board.

I acknowledge receiving a copy of this informed consent.

_____   _____
                Participant   Date

_____
                Investigator

Investigator: Matthew Cook   884-0710 ext. 2987
Supervisor: Dr. Max Gwynn   884-0710 ext. 3854

Appendix O
Desire for Control Scale

Below you will find a series of statements. Please read each statement carefully and respond to it by expressing the extent to which you believe the statement applies to you. For all items a response from 1 to 7 is required as follows:

1   The statement doesn't apply to me.
2   The statement doesn't usually apply to me.
3   Most often, the statement doesn't apply.
4   I am unsure about whether or not the statement applies to me, or it applies to me about half the time.
5   The statement applies more often than not.
6   The statement usually applies to me.
7   The statement always applies to me.

It is important that you respond to all items.

1.   I prefer a job where I have a lot of control over what I do
        and when I do it.   _____

2.   I enjoy political participation because I want to have as much
        of a say in running government as possible.   _____

3.   I try to avoid situations where someone else tells me what to do.   _____

4.   I would prefer to be a leader rather than a follower.   _____

5.   I enjoy being able to influence the actions of others.   _____

6.   I am careful to check everything on an automobile before I leave
        for a long trip.   _____

7.   Others usually know what is best for me.   _____

8.   I enjoy making my own decisions.   _____

9.   I enjoy having control over my own destiny.   _____

10.   I would rather someone else took over the leadership role when I'm   _____
        involved in a group project.

11.   I consider myself to be generally more capable of handling difficult
        situations than others are.   _____

12. I'd rather run my own business and make my own mistakes than   _____
     listen to someone else's orders.

13. I like to get a good idea of what a job is all about before I begin.   _____

14. When I see a problem I prefer to do something about it rather than   _____
     sit by and let it continue.

15. When it comes to orders, I would rather give them than receive them.   _____

16. I wish I could push many of life's daily decisions off on someone else. _____

17. When driving, I try to avoid putting myself in a situation where I   _____
     could be hurt by someone else's mistake.

18. I prefer to avoid situations where someone else has to tell me what   _____
     it is I should be doing.

19. There are many situations in which I would prefer only one choice   _____
     rather than having to make a decision.

20. I like to wait and see if someone else is going to solve a problem   _____
     so that I don't have to be bothered by it.

Please do not turn the page until instructed to do so.

Appendix P

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by indicating **SURE** or **UNSURE**. Do not return to earlier pages in the booklet at any time.

			SURE	**UNSURE**
1.) What was the customer's name?				
	Mr. Wallace	Mr. Walter	S	U
2.) From where did the offender take the gun?				
	Bag	Waistband	S	U
3.) After jumping on the counter, what did the offender do? ***				
	Reached for money	Pointed gun at customer	S	U
4.) Who did the cashier call after the shooting?				
	Police	Operator	S	U
5.) In which direction did the offender go when he departed the store?				
	Right	Left	S	U
6.) What was the address of the store?				
	22 Bridge	22 Becker	S	U
7.) In which ear(s) did the offender wear the gold earring? ***				
	Both	Left	S	U
8.) What colour was the cashier's blouse?				
	Yellow	White	S	U
9.) What colour were the victim's pants?				
	Black	Brown	S	U
10.) What did the offender do with the cigarette he was smoking when he entered the store? ***				
	Put it in ashtray	Threw it on floor	S	U
11.) What colour was the offender's shirt?				
	Grey	Black	S	U
12.) What type of shoes was the offender wearing?				
	Loafers	Running shoes	S	U

13.) What colour of tie was the victim wearing?

        Black   Navy   S   U

14.) Besides the tattoo on his left forearm, did the offender
      have any other identifying features or scars? ***

        Yes   No   S   U

15.) What was the approximate height of the offender
      (in feet and inches)?

        5'8"-5'10"   5'11"-6'   S   U

16.) In which hand(s) did the offender hold the gun when
      he fired the shot(s)?

        Right   Both   S   U

17.) What colour was the offender's headband?

        Red & White   Orange & White   S   U

18.) After he said "Move back", what did the offender
      say to the customer? ***

        Shut up   Keep away   S   U

19.) What colour were the offender's shoes?

        Black   White   S   U

20.) Where were the offender's wire-rim glasses placed? ***

        On his forehead   Over his eyes   S   U

21.)For approximately how long (in seconds) was
      the offender in the store?

        _____ seconds   S   U

22.) Using a scale of one to ten, with one being very calm and ten being very nervous, how calm/nervous did the offender appear to be after the shooting? (circle a number)

    1   2   3   4   5   6   7   8   9   10
    Very   Very
    Calm   Nervous

N. B. Note that *** indicates the six misleading items.

Please do not turn the page until instructed to do so.

Appendix Q

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by indicating **SURE** or **UNSURE**. Do not return to earlier pages in the booklet at any time.

	SURE	**UNSURE**
1.) What was the customer's name?		
Mr. Wallace Mr. Walter	S	U
2.) From where did the offender take the gun?		
Bag Waistband	S	U
3.) Did the offender slam his gun on the counter? ***		
Yes No	S	U
4.) Who did the cashier call after the shooting?		
Police Operator	S	U
5.) In which direction did the offender go when he departed the store?		
Right Left	S	U
6.) What was the address of the store?		
22 Bridge 22 Becker	S	U
7.) With which hand(s) did the offender reach into his bag? ***		
Both Left	S	U
8.) What colour was the cashier's blouse?		
Yellow White	S	U
9.) What colour were the victim's pants?		
Black Brown	S	U
10.) Was the offender smoking a cigarette when he entered the store? ***		
Yes No	S	U
11.) What colour was the offender's shirt?		
Grey Black	S	U
12.) What type of shoes was the offender wearing?		
Loafers Running shoes	S	U

13.) What colour of tie was the victim wearing?

     Black   Navy   S   U

14.) Did the offender have any identifying features or scars? ***

     Yes   No   S   U

15.) What was the approximate height of the offender
(in feet and inches)?

     5'8"-5'10"   5'11"-6'   S   U

16.) In which hand(s) did the offender hold the gun when
he fired the shot(s)?

     Right   Both   S   U

17.) What colour was the offender's headband?

     Red & White   Orange & White   S   U

18.) After yelling at the customer, what did the offender say
to him? ***

     Shut up   Keep away   S   U

19.) What colour were the offender's shoes?

     Black   White   S   U

20.) Was the offender wearing a baseball hat? ***

     Yes   No   S   U

21.)For approximately how long (in seconds) was
the offender in the store?

_____ seconds   S   U

22.) Using a scale of one to ten, with one being very calm and ten being very nervous, how calm/nervous did the offender appear to be after the shooting? (circle a number)

     1   2   3   4   5   6   7   8   9   10
     Very   Very
     Calm   Nervous

N. B. Note that *** indicates the six non-misleading items.

Please do not turn the page until instructed to do so.

Appendix R

Please respond to each of the following questions by circling the appropriate answer and indicate your confidence in the correctness of each answer by indicating **SURE** or **UNSURE**. Do not return to earlier pages in the booklet at any time.

	SURE	**UNSURE**
1.) What colour were the offender's pants? Black Blue	S	U
2.) Did the offender have a tattoo on his left forearm? Yes No	S	U
3.) Was the offender wearing an earring or earrings? Yes No	S	U
4.) What colour was the offender's hair? Brown Black	S	U
5.) Did the offender jump on the counter? Yes No	S	U
6.) Was the offender wearing wire-rim glasses? Yes No	S	U
7.) Did the offender's shirt have anything on the back? Nothing Words	S	U
8.) Was the offender smoking a cigarette when he entered the store? Yes No	S	U
9.) What was the offender wearing around his neck? Silver chain White beads	S	U
10.) Did the offender use the exact words "Move back" or "Shut up" while yelling at the customer? Move back Shut up	S	U

Please do not turn the page until instructed to do so.

Appendix S

Please respond to each of the following questions by circling the appropriate answer and indicate your overall confidence as a group in the correctness of each answer by circling S for **SURE** or U for **UNSURE**. Do not return to earlier pages in the booklet at any time.

		SURE	**UNSURE**
1.) What was the customer's name?			
Mr. Wallace	Mr. Walter	S	U
2.) From where did the offender take the gun?			
Bag	Waistband	S	U
3.) Did the offender jump on the counter?			
Yes	No	S	U
4.) Who did the cashier call after the shooting?			
Police	Operator	S	U
5.) In which direction did the offender go when he departed the store?			
Right	Left	S	U
6.) What was the address of the store?			
22 Bridge	22 Becker	S	U
7.) Was the offender wearing an earring or earrings?			
Yes	No	S	U
8.) What colour was the cashier's blouse?			
Yellow	White	S	U
9.) What colour were the victim's pants?			
Black	Brown	S	U
10.) Was the offender smoking a cigarette when he entered the store?			
Yes	No	S	U
11.) What colour was the offender's shirt?			
Grey	Black	S	U
12.) What type of shoes was the offender wearing?			
Loafers	Running shoes	S	U

13.) What colour of tie was the victim wearing?

     Black   Navy   **S**   **U**

14.) Did the offender have a tattoo on his left forearm?

     Yes   No   **S**   **U**

15.) What was the approximate height of the offender
     (in feet and inches)?

     5'8"-5'10"   5'11"-6'   **S**   **U**

16.) In which hand(s) did the offender hold the gun when
     he fired the shot(s)?

     Right   Both   **S**   **U**

17.) What colour was the offender's headband?

     Red & White   Orange & White   **S**   **U**

18.) Did the offender use the exact words "Shut up" or
     "Move back" while yelling at the customer?

     Shut up   Move back   **S**   **U**

19.) What colour were the offender's shoes?

     Black   White   **S**   **U**

20.) Was the offender wearing wire-rim glasses?

     Yes   No   **S**   **U**

21.)For approximately how long (in seconds) was the
     offender in the store?

     _____ seconds   **S**   **U**

22.) Using a scale of one to ten, with one being very calm and ten being very nervous, how calm/nervous did the offender appear to be after the shooting? (circle a number)

     1   2   3   4   5   6   7   8   9   10
     Very   Very
     Calm   Nervous

Please do not turn the page until instructed to do so.

Appendix T

Please respond to each of the following questions by circling the appropriate answer and indicate whether your answer is **SAME** or **DIFFERENT** than your group's answers. Do not return to earlier pages in the booklet at any time.

			SAME	DIFFERENT
1.) What was the customer's name?				
	Mr. Wallace	Mr. Walter	S	D
2.) Did the offender jump on the counter?				
	Yes	No	S	D
3.) From where did the offender take the gun?				
	Bag	Waistband	S	D
4.) Who did the cashier call after the shooting?				
	Police	Operator	S	D
5.) In which direction did the offender go when he departed the store?				
	Right	Left	S	D
6.) What was the address of the store?				
	22 Bridge	22 Becker	S	D
7.) Was the offender wearing an earring or earrings?				
	Yes	No	S	D
8.) What colour was the cashier's blouse?				
	Yellow	White	S	D
9.) What colour were the victim's pants?				
	Black	Brown	S	D
10.) Was the offender smoking a cigarette when he entered the store?				
	Yes	No	S	D
11.) What colour was the offender's shirt?				
	Grey	Black	S	D
12.) What type of shoes was the offender wearing?				
	Loafers	Running shoes	S	D

13.) What colour of tie was the victim wearing?

      Black   Navy   S   D

14.) Did the offender have a tattoo on his left forearm?

      Yes   No   S   D

15.) What was the approximate height of the offender
(in feet and inches)?

      5'8"-5'10"   5'11"-6'   S   D

16.) In which hand(s) did the offender hold the gun
when he fired the shot(s)?

      Right   Both   S   D

17.) What colour was the offender's headband?

      Red & White   Orange & White   S   D

18.) Did the offender use the exact words "Shut up" or
"Move back" while yelling at the customer?

      Shut up   Move back   S   D

19.) What colour were the offender's shoes?

      Black   White   S   D

20.) Was the offender wearing wire-rim glasses?

      Yes   No   S   D

21.) For approximately how long (in seconds) was
the offender in the store?

      _____ seconds   S   D

22.) Using a scale of one to ten, with one being very calm and ten being very nervous, how calm/nervous did the offender appear to be after the shooting? (circle a number)

1	2	3	4	5	6	7	8	9	10
Very Calm									Very Nervous

Please do not turn the page until instructed to do so.

Appendix U

Without going back to previous pages, please describe, in point form:

a.) the offender's jewelry (i.e., earrings, necklace, watch, rings, etc., including colour for each item)

b.) the offender's actions with respect to anything he brought into the store, and how he acted at the counter

c.) any distinguishing features or disguises that the offender had (e.g., tattoos, mustache, mask, glasses, etc.)

d.) what the offender said to the customer, using exact wording where possible (except for swear words)

Please do not turn the page until instructed to do so.

Appendix V

Throughout today's session you have received many details and a lot of information concerning the crime from different sources. For instance, you may have received information from the video, from the questionnaires that you answered, from the group discussion, from any combination of these three, or from none of the above.

Please indicate below if you remember:
-seeing the item in the video (**VIDEO = V**)
-reading the item in the questionnaires (**QUESTIONNAIRES = Q**)
-hearing about the item during group discussion (**GROUP = G**)
-none of the above (**NONE = N**)

If you **do not remember** ever receiving the information that you are asked about, circle "**None**".

You should **circle as many responses** as is appropriate for each item.

	VIDEO	**QUESTIONNAIRES**	**GROUP**	**NONE**
Offender was wearing a headband	V	Q	G	N
Offender took his bag with him	V	Q	G	N
Offender had a tattoo on left forearm	V	Q	G	N
Offender was wearing wire glasses	V	Q	G	N
Offender had brown curly hair	V	Q	G	N
Offender was wearing blue jeans	V	Q	G	N
Offender had a cigarette pack	V	Q	G	N
Offender was smoking a cigarette	V	Q	G	N
Offender was wearing a black shirt	V	Q	G	N
Offender said 'Move back'	V	Q	G	N
Offender was wearing a black belt	V	Q	G	N
Offender was clean-shaven	V	Q	G	N
Offender wore a gold earring(s)	V	Q	G	N
Offender had a design on back of shirt	V	Q	G	N
Offender jumped on counter	V	Q	G	N

Please do not turn the page until instructed to do so.

Appendix W

We realize that group members in your group may have had different responses to the questions that we asked concerning the crime. At this time we are interested in how your group resolved these differences. That is, how did your group decide to arrive at the answer that was eventually selected? Please write your answers, in as much detail as possible, in the space provided.

Please respond to the following question by circling the most appropriate number on the scale as it applies to you. To what extent did the group discussion make you reconsider, or doubt, your original memory as it relates to the crime?

0-------1-------2-------3-------4-------5-------6-------7-------8-------9-------10
No Reconsideration   Some Reconsideration   Lot of Reconsideration

Please do not turn the page until instructed to do so.

Appendix X

We are interested in your opinions concerning this research. In your own words briefly

describe what you believe were the main purposes of this study.

Appendix Y
Information about this study
An investigation into eyewitness testimony
Study #

First of all I would like to thank you for your participation in this study. This experiment was conducted to assess the impact of group discussion on the recall of eyewitnesses. Previous research studies have found a phenomenon called the misinformation effect in which participants include incorrect information that they have been exposed to into their subsequent recall of the details and events of a crime. Past studies investigating the effects of group discussion on eyewitness testimony have found that, under some conditions, groups recall more accurate information than individuals, while at other times there are no differences in recall accuracy between groups and individuals.

This study was designed to determine the impact of group discussion and the presence of misinformation on eyewitness recall.

All participants viewed the same video and subsequently completed the same personality questionnaires (one which measured desire for control and one which measured self-monitoring). However, half of the participants then received misleading information (e.g., that the offender was wearing an earring) on the first questionnaire, whereas the other participants did not receive this misleading information. As well, participants completed a second recognition test either individually or as a member of a group of two or six. This manipulation was performed in order to determine the effect of group discussion on eyewitness memory. Confidence ratings in the form of a 'sure/unsure' scale were also assessed on some questionnaires as previous studies have shown that a person's confidence level is not indicative of the correctness of his/her answer.

You should not be concerned if, while attempting to recall the details of the video, you may have partially relied on what you were told other participants had said. Memory is not perfect, and no one can remember every small detail. Quite often in a real eyewitness situation we may hear descriptions from other people which may in turn shape our own subsequent memory and descriptions. This is a natural and usually beneficial way of sorting through what may be vague memories of details of a complicated event.

For specific articles regarding eyewitness memory and group discussion effects on eyewitness testimony you may consult:

Loftus, E. F. (1992). When a lie becomes memory's truth: Memory distortion after exposure to misinformation. Current Directions in Psychological Science, 1, 121-123., and

Yarmey, A. D., & Morris, S. (1998). The effects of discussion on eyewitness memory. Journal of Applied Social Psychology, 28, 1637-1648.

You may also consult your Psychology 100 6th edition textbook by D. G. Myers (2000) on pages 345 - 346 for more information about the misinformation effect.

You may read a short summary of the results of this study which will be posted on the bulletin board outside the Psychology Office by April 7, 2001.

If you have any questions or concerns regarding this study you may contact the researcher, Matthew Cook, by telephone at 884-0710 ext. 2987 or by e-mail at cook6280@mach1.wlu.ca. The thesis supervisor, Dr. Max Gwynn, may be contacted by telephone at 884-0710 ext.3854 or by e-mail at mgwynn@wlu.ca.
Once again thank you very much for your participation.

Appendix Z

Confidence-Accuracy Relationship – Experiment 1

In order to determine if there was a relationship between confidence and accuracy for the reporting of neutral and misleading details, correlational analyses were conducted between the total number of neutral or misleading items answered correctly and total confidence for the 15 neutral or five misleading items. The correlations were computed separately by treatment condition, according to whether or not the participants received misleading information, and whether or not the participants completed all recognition tasks individually or one task as a member of a group. (See Table 5 below for the respective correlation coefficients. Note that one person from the non-misled individual condition was excluded from these analyses due to an apparent misunderstanding of the use of the rating scales). The results indicated that interpretations involving the confidence-accuracy relationship must be made tentatively, as there was a wide range of correlation magnitudes, even between equivalent groups. For example, pre-group correlations for neutral items should not differ between participants in the individual versus group conditions, as they have been treated equivalently up to that point. However, the correlation for the misled-group condition is negligible ($r = .074$, ns). while in the misled-individual condition this same correlation reaches significance ($r = .497$, $p < .01$). An examination of the raw data and scatterplots did not yield evidence as to why these correlations differ to such a degree. It may be that the relatively small sample sizes (n's of approximately 30) may yield unstable correlations.

Table 5

Correlation Coefficients for Confidence-Accuracy for Neutral and Misleading Items by

Misled/Non-Misled and by Individual/Group on Experiment 1

Condition	Items	Pre-Group	Group	Post-Group
Non-Misled	Neutral	.371*	.487**	.413*
Individual	Misleading	.011	-.012	.008
n=29				
Non-Misled	Neutral	.180	.289	.180
Group	Misleading	-.059	.114	-.049
n=90				
n=31 for group correlation				
Misled	Neutral	.497**	.662***	.648***
Individual	Misleading	.490**	.426*	.420*
n=30				
Misled	Neutral	.074	.139	.206
Group	Misleading	.362***	.073	.120
n=90				
n=31 for group correlation				

All probability levels are two-tailed.
*p < .05
**p < .01
***p < .001

Confidence-Accuracy Relationship – Experiment 2

As in Experiment 1, in order to determine if there was a relationship between confidence

and accuracy in reports of neutral and misleading items, correlational analyses were conducted

between the total number of correct neutral and misleading items reported and total confidence.

The correlations were computed separately by treatment combination, according to whether or

not the participants received misleading information, and whether or not the participants

completed all recognition tasks individually or one task as a member of a group (see Table 6

below for the respective correlation coefficients). Unlike Experiment 1 in which there were

many significant correlations, Experiment 2 produced very few significant correlations. The

inconsistency in the confidence-accuracy relationship in these two studies seems to suggest that,

at least in our studies, confidence and accuracy are not strongly related together.

Table 6

Correlation Coefficients for Confidence-Accuracy for Neutral and Misleading Items by

Misled/Non-Misled and by Individual/Group on Experiment 2

Condition	Items	Pre-Group	Group	Post-Group
Non-Misled	Neutral	.203	.560**	.364*
Individual	Misleading	-.242	-.310	-.347
n=30				
Non-Misled	Neutral	.094	.145	####
Group	Misleading	-.028	-.335	####
n=60				
n=20 for group correlation				
Misled	Neutral	.384*	.328	.312
Individual	Misleading	.009	.114	.245
n=30				
Misled	Neutral	.057	-.214	####
Group	Misleading	.245	.159	####
n=60				
n=20 for group correlation				

All probability levels are two-tailed.
*$p < .05$
**$p < .01$
- confidence levels were not collected for these participants

Footnotes

1. Confidence ratings were collected and analyzed, however they produced results that were inconsistent and largely uninterpretable. Therefore, confidence analyses have been excluded from the body of the paper, but are presented as Appendix Z.

2. The data for the post-group ANOVA's have violated the assumptions of independence as participants' answers have now been affected by the group to which they belonged. Kenny, Kasher, and Bolger (1998) have suggested that more appropriate analyses would be to have the group act as the unit of analysis or to conduct an intra-class correlation. However, we did not feel that these were appropriate to our analyses as this would result in an unequal number of groups per condition (i.e., five groups of six and 15 groups of two). Using groups as the unit of analysis would also substantially reduce the power of the statistical tests.

3. Six participants out of 240 in Experiment 1 and 13 of 180 participants in Experiment 2 stated that they realized that they had received incorrect information in their questionnaires. Perhaps more participants stated that they had received incorrect information in Experiment 2 because three misleading items were used that we expected only a minority of participants would endorse. Thus, this more obviously incorrect information may have alerted more participants to the fact that they have received wrong information. None of the participants reported that they acted on this suspicion nor mentioned them in the group discussions.