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UNCERTAINTY IN THE GROUP CONTEXT: CATEGORIZATION EFFECTS ON
PERSUASIVE MESSAGE PROCESSING AND INGROUP FAVOURITISM

by

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in
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ABSTRACT

Personality differences in uncertainty orientation (Sorrentino & Short, 1986) were examined in the context of social identification processes relevant to both information-processing (Study 1) and ingroup favouritism (Study 2). Uncertainty-oriented (UO) people are motivated to attain clarity and learn new information about the self and the environment, whereas certainty-oriented (CO) people are motivated to maintain clarity, adhering to what is already known. UOs are believed to use groups for resolving uncertainty, directly confronting uncertainty and carefully processing information. COs should use groups as a basis for subjective judgement to circumvent uncertainty.

To the extent that disagreement with ingroup members creates uncertainty (Turner, 1985) and that uncertainty is the key to group behaviour (Hogg & Abrams, 1993; Hogg & Mullin, 1999), UOs should more carefully process messages that are incongruent with expectations (i.e., high uncertainty) based on social categorization. COs should more carefully process expectancy-congruent (i.e., high certainty) messages. In Study 1, participants were exposed to a strong or weak, counter- or pro-attitudinal message from an ingroup or outgroup source. As predicted, UOs carefully processed information, favouring strong over weak arguments, under conditions of high uncertainty (ingroup disagreement, outgroup agreement), while COs more carefully processed under low uncertainty conditions (ingroup agreement, outgroup disagreement).

In Study 2, participants were either categorized (i.e., assigned to a group) or uncategorized while performing a resource allocation task under low or high task uncertainty. Hogg and Abrams (1993) argue that people identify with groups to reduce subjective uncertainty. This theoretical orientation should be more amenable to COs,

who increase reliance on heuristics (judgement shortcuts and rules of thumb) under high uncertainty (Sorrentino, Bobocel, Gitta, Olson, & Hewitt, 1988). As expected, only COs favoured their ingroups, particularly under high (vs low) uncertainty. This pattern was not accompanied by increased identification, uncertainty reduction, or self-esteem, but was partially mediated by social consciousness. Presumably the ingroup category served as a heuristic decision rule (e.g., “*look out for your own*”) for these COs. UOs showed no consistent favouritism, likely because the ingroup category provided no information for uncertainty resolution in the present paradigm. The implications for both studies are discussed in terms of social identification processes and uncertainty reduction strategies.

Keywords: uncertainty, persuasion, social influence, information processing, ingroup favouritism, social identity, social cognition.

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CHAPTER I:
BACKGROUND AND STATEMENT OF THE PROBLEM

Uncertainty in the Group Context: Categorization Effects on Persuasive
Message Processing and Ingroup Favouritism

The topic of social identity remains one of the prime concerns in social psychology today. Researchers are particularly interested in how, why, and when we define ourselves in terms of our social identities (e.g., “Canadian”, “student”) along with the consequences of such categorizations. Researchers have argued that groups (or social categories) serve a pivotal role in providing group members with a means to deal with uncertainty (see Hogg & Abrams, 1993; Hogg, in press; Tajfel & Billig, 1974). Given that personality types differ in their reactions to uncertainty (Sorrentino & Short, 1986), however, social categorization effects should likewise vary as a function of one’s personality. The two studies presented in this body of work address how personality and situational determinants interact to influence the use of social categories.

The uncertainty orientation theory (Sorrentino & Short, 1986) stipulates that uncertainty-oriented individuals approach and resolve uncertainty directly, whereas certainty-oriented people adhere to certainty and familiarity, increasing their use of heuristics and other judgement shortcuts in the face of uncertainty (see Sorrentino et al., 1988). Such personality differences were expected to play an important role in the processes investigated in the present investigation. In Study 1, the author addresses when and for whom categorization serves as a persuasion heuristic, and when and for whom it

fosters more careful, systematic information-processing. Anticipating that reactions to uncertainty created through social categorization “conflicts” (e.g., disagreeing with one’s ingroup) would be moderated by personality differences among recipients of a persuasive message, the uncertainty orientation construct was included in the design of the study. In Study 2, personality differences in uncertainty orientation were expected to moderate the extent to which social categorization under conditions of uncertainty results in resource allocation strategies favouring the ingroup over the outgroup.

Groups and Social Categories

Group researchers tend to disagree on a single definition of “group.” Conceptual foci range from interpersonal dependence (Cartwright & Zander, 1968; Lewin, 1948), to social interaction and reciprocal influence (Shaw, 1981), group roles (Sherif & Sherif, 1956), shared group definition by members (Brown, 1988) and group identification (Tajfel & Turner, 1979). From a self-categorization perspective, Turner, Hogg, Oakes, Reicher and Wetherell (1987) specify that:

a psychological group is defined as one that is psychologically significant for the members, to which they relate themselves subjectively for social comparison and the acquisition of norms and values, that they privately accept membership in, and which influences their attitudes and behavior (pp. 1-2).

The term “group” and “social category” are often used interchangeably in the research literature. Strictly speaking, one could argue that the present investigation will be discussing social categories more than groups *per se*. That is, the ingroup-outgroup categorizations involve a broad collective identity (a University of Western Ontario student, Study 1) and an arbitrary “minimal group” with no previous history or current

contact (Study 2). Hence, participants in the present investigation are not acting *in* groups, but are acting *as* group members.

In particular, the present investigation concerns the implications of being an ingroup (vs outgroup) member. For our purposes, an ingroup can be defined as a social category describing “we” and “us” versus an outgroup category that describes “they” and “them” (see Dovidio & Gaertner, 1993). Thus, as a man I share the ingroup category “man” with my father yet not the outgroup category “woman” with my mother. In this sense, ingroups constitute groups or social categories to which we belong, and outgroups represent groups or social categories to which we do not belong. Central to this discussion is the notion of social identification, to which we now turn.

Social Identity Theory

According to Tajfel (1981, p.255), social identity refers to “that part of the individual’s self-concept which derives from his knowledge of his membership of a social group (or groups) together with the value and emotional significance attached to that membership.” In addition to one’s personal identity, therefore, one’s memberships in social categories constitute an important and meaningful part of the self-concept. As such, social and personal identities are intimately linked (yet distinct) aspects of social life that share important functions in the maintenance of the self-concept (for a review see Deschamps & Devos, 1998).

These notions of categorization followed the writings of Bruner (1957). He argued that each object of perception, whether human or nonhuman, “is placed in and achieves its ‘meaning’ from a class of percepts with which it is grouped” (Bruner, 1957, p.124). According to this perspective, “all perceptual experience is necessarily the end

product of a categorization process” (Bruner, 1957, p.124). Thus, categorization allows perception to occur, and it confers a sense of meaning to the perceiver.

Although Tajfel’s early research focused on how social influences impact basic perception (e.g., Tajfel, 1959), he soon noted the relevance of these basic processes for a variety of intergroup phenomenon, including prejudice and ingroup favouritism (e.g., Tajfel, 1963; Tajfel, Billig, Bundy, & Flament, 1971; Tajfel & Billig, 1974). After more than a decade of research on the topic, Tajfel and Turner (1979) concluded that: (a) people are motivated to attain and maintain favourable social identities; (b) favourable comparisons must be made between the ingroup and a relevant outgroup in order for a favourable ingroup perception to be possible; and (c) when dissatisfied with a particular social identity, group members will either attempt to join a more positive group (abandoning their own group) and/or engage in efforts to increase the favourability of their own group.

These basic postulates of social identity theory centre on the involvement of two distinct processes in group behaviour, one concerned with categorization and the other with motivation. Recognizing that categorization of *all* physical stimuli allows people to make better sense of their world, Tajfel suggested that social categorization is no exception. Social categorization, therefore, is the process whereby individuals (including the self) are assigned to social categories in order to make sense of the world. This process occurs naturally, resulting in the elaboration of intragroup similarities and intergroup differences (Tajfel & Turner, 1979).

In addition to mere categorization, however, motivational elements have been implicated by the theory. In its early conceptualizations, social identity theory held that

stereotyping and other group processes might be indicative of a motivated need for coherence (i.e., consolidation of ideas about a social group) by group members (Tajfel, 1969; Tajfel & Billig, 1974). This ideology was unfortunately neglected in later revisions, where social identity theory shifted focus to the attainment and maintenance of positive social identities in the service of self-esteem needs. Accordingly, self-esteem maintenance goals are realized via identification with positive social categories and dissociation from (or comparison with) negative social identities whenever such strategies are possible.

Although both categorizational (i.e., cognitive) and motivational processes have been implicated in the identification process, Tajfel was able to demonstrate that categorization alone was sufficient to result in group behaviour (e.g., Tajfel & Billig, 1974; Tajfel et al, 1971). In the interest of “stripping” groups to their bare elements, Tajfel and his colleagues developed the so-called “minimal group paradigm” (Tajfel et al., 1971; Bourhis, Sachdev, & Gagnon, 1994). In such experiments, participants are assigned to an arbitrary category based on relatively meaningless criteria, such as the ability to estimate dot frequencies. These laboratory “groups” have been found to engage in group behaviour (e.g., show favouritism toward the ingroup), even in the absence of prior history or previously meaningful labels (for reviews see Brewer, 1979; Diehl, 1990). Apparently, the process of categorization itself can impart important meaning on category labels.

Experimental tests of social identity theory have revealed strong support for the categorization effects (see Brewer, 1979; Tajfel, 1982). The motivational processes, however, have failed to demonstrate consistent effects, particularly for the motive of self-

esteem enhancement (Abrams & Hogg, 1988; see also Hogg & Abrams, 1990, 1993). For instance, it is unclear whether self-esteem enhancement is an antecedent or consequence of identification with a particular social group. Abrams and Hogg suggest that the impact of the self-esteem motive is over-stated, and that researchers are often at fault for confusing global and specific self-esteem (see Rubin & Hewstone, 1998 for related arguments). In response to this apparent problem, many subsequent researchers have de-emphasized the motivational component and focused primarily on the categorization process. Self-categorization theory is the product of such a transition.

Self-Categorization Theory

Turner and his colleagues (Haslam, Oakes, Turner, & McGarty, 1996; Turner, 1985; Turner et al., 1987) developed self-categorization theory as an extension of the theory and research spawned by social identity theory. From this perspective, social identities are conceptualized as “cognitive groupings of oneself and some class of stimuli as the same” compared to other categories of stimuli (Turner et al., 1987, p.42). The motivational underpinnings evident in social identity theory are hence de-emphasized in self-categorization theory (Hogg, in press; Hogg & Mullin, 1999). Instead, this theory emphasizes what is referred to as the “meta-contrast” ratio, which concerns the contrast between perceived variabilities of ingroups and outgroups. Specifically, a category of stimuli is categorized as a social unit if the variability within the category is less than the variability between the category and that of another category. This is similar to the F-test employed frequently by psychologists, where one examines whether the variance between two groups is greater than the variance within the groups. From the perspective of self-categorization theory, therefore, it makes sense to categorize a group of

Americans as Americans if the differences among them (along a dimension relevant for categorization) are smaller than the differences between their group and another group (e.g., a group of Germans). A more detailed account of general categorization processes, from which self-categorization owes a great deal of its origins, can be found elsewhere (e.g., Rosch, 1978).

In recognizing that social identity theory was somewhat limited to the analysis of intergroup discrimination, self categorization theory was introduced to provide a more complete account of group functioning (Haslam et al., 1996; Hogg, 1996b), although this criticism might be overly harsh and unwarranted (Hogg, 1996b). Social identity theory certainly has a clear motivational focus, addressing *why* we need social identities. Self-categorization theory, adopting a more cognitive approach, addresses the *process* that determines *which* social identities we choose. Thus, for the former theory, identification is important for the achievement of favourable ingroup distinctiveness, while for the latter theory identification is important as a cognitive mechanism that mediates group behaviour (Turner et al., 1987). In addition, social identity theory typically pitted self vs group identity along a continuum, treating the two as separate entities, whereas self-categorization theory treats both personal and group facets as aspects of the self, simply at different levels of cognitive abstraction (Turner et al., 1987). This shifting focus of self-categorization theory makes it the more dynamic of the two theories. Nonetheless, many recognize considerable overlap between the two theories (Hogg & Abrams, 1988; Hogg & McGarty, 1990; Turner et al., 1987) and view self-categorization theory as the more focused, cognitive branch of social identity theory.

Several key hypotheses have been forwarded by Turner et al. (1987) and Haslam et al. (1996) regarding the nature of self-categorization. First, a person's self-concept is interchangeable with other stimuli within its class (i.e., within the person's social ingroup), and does not fit with stimuli from outside of its class (i.e., within the person's social outgroups). Accordingly, "the individual is perceptually and behaviourally depersonalized in terms of the relevant ingroup prototype" (Hogg, 1996a, p.69). Put more simply, when it is meaningful for a person to categorize at the group or social level (vs the personal level), he or she will do so, making all ingroup members (including the self) interchangeable units that perceptually conform to a common group norm. Second, identities exist at varying levels of abstraction, whereby the highest levels are the most inclusive. People thus have category designations at the human, social, and personal level, all of which are valid and relevant to the self-concept. Situational or contextual factors usually determine which level of categorization is appropriate (or salient) at any given time. For instance, an individual is unlikely to self-categorize at the social level (e.g., "Canadian") when comparing the self with a member from the category "canine", as this would not be a useful categorization. In that particular case, categorizing oneself as "human" would make more sense than categorizing oneself as Canadian.

The primarily cognitive focus of self-categorization theory has led to an emphasis on cognitive principles such as stimulus salience and accessibility (Deaux, 1996). Therefore, the use of a category-based judgement is dependent upon the visibility of the category and the ease with which the category is brought into service. In addition to these principles, Oakes (1987; Turner & Oakes, 1986, 1989) has introduced the notion of *fit*; comparisons based on meta-contrasts (i.e., "comparative fit") will result in social

categorization only on dimensions which typify the groups in comparison (i.e., “normative fit”). In other words, categorization is facilitated to the extent that categorization principles “fit” with existing notions of stereotypes for any given group. For example, Oakes & Turner (1990, p.126) argue that gender categories would become appropriate and activated social categories to the extent that when a gathering of men and women argue with one another: (a) the differences in opinion are greater between groups than within groups (the meta-contrast ratio, exemplifying “comparative fit”); and (b) that the difference in opinion is “normatively consistent with stereotypical expectations... [men] taking an antifeminist and the women a profeminist stand]”, exemplifying “normative fit.” In support of these ideas, categorization processes are activated when it is contextually meaningful to do so (see Oakes & Turner, 1990).

In keeping with this cognitive focus, Turner et al. (1987) suggest that category members are evaluated positively to the extent that they are judged to match the prototype of the ingroup, where prototypes are conceptualized as “fuzzy” and implicit notions of exemplary group figures. As a consequence, traditional notions of group cohesion have been reinterpreted by these researchers. Couched in terms of self-categorization theory, affective reactions (exemplified by attraction to the group and its members) are *consequences* of the categorization process, not antecedents to it (Hogg, 1992, 1993). The self-categorization perspective therefore holds that group members are not motivated to form groups because they are attracted to the group goals, activities, or members *per se* (cf. Festinger, 1950), but rather because social categories are useful in making sense of the world. Individuals become attracted to the group and its members to the extent that they match a category prototype that provides social meaning.

In summary, self-categorization theory posits that people categorize the self at multiple levels of abstraction (i.e., human, social, personal), with situational cues determining which level of categorization becomes salient, meaningful, and influential in the classification and judgement processes. Stimulus categories are most fully activated and relevant when the comparative fit (i.e., intercategory differences being greater than intracategory differences) and the normative fit (i.e., category use fits with stereotypic expectations) make the categorization useful. Accordingly, social categories are presented as meaningful social constructs, not mere simplifications of the social environment (cf. Bodenhausen, 1993; Hamilton & Trolie, 1986). Given that groups and categories have real psychological meaning, the categorization process is viewed as a natural phenomenon (Oakes & Turner, 1990), where “in many contexts it is entirely appropriate” (Haslam et al., 1996, p.205).

The Motivation Issue in Social Identity

The theoretical review thus far has demonstrated social identity theory’s focus on the cognitive (i.e., categorizational) and motivational (self-esteem enhancement) processes involved with intergroup behaviour. The more recent extension of self-categorization theory has attempted to account for group behaviour more generally, stressing the cognitive processes involved in categorization and group behaviour. The importance of social identity to the self-categorization perspective is duly reflected in Turner’s (1982, p.21) claim that “social identity is the cognitive mechanism that makes group behavior possible.” This is not to say that motivation is unimportant to the self categorization perspective. Indeed, self-categorization theorists argue that their theory “seeks to encompass the motivational aspects of social identity theory within a more

rigorous and far-reaching social-cognitive framework” (Haslam et al., 1996, p.206).

Despite this assertion, however, motivational implications are rarely discussed in the traditional self-categorization theory framework, and researchers have noted the absence of motivation from the theory (e.g., Brewer & Brown, 1998; Hogg, in press).

More recently, Hogg and his colleagues (Hogg & Abrams, 1993; Hogg & Mullin, 1999; Mullin & Hogg, 1998) have re-introduced the motive for coherence in social identification processes. Here coherence is conceptualized as uncertainty reduction. Due to the purported aversive nature of uncertainty, these theorists argue that *all* people seek to achieve certainty, and that this is achieved via identification with an ingroup. From this perspective, other motives (e.g., self-esteem, affiliation) are considered secondary motives that act in the service of uncertainty reduction. In short, Hogg and colleagues suggest that group members, in the interest of reducing subjective uncertainty, should identify with their ingroups and engage in intergroup behaviour (e.g., ingroup bias or favouritism).

The Theory of Uncertainty Orientation

Sorrentino and colleagues (Sorrentino & Short, 1986; Sorrentino, Short, & Raynor, 1984) have adopted an individual difference approach to the issue of uncertainty resolution. The uncertainty orientation construct (Sorrentino & Short, 1986) originated from an integration of Rokeach’s (1960) work on the open and closed mind and Kagan’s (1972) conceptualizations of uncertainty resolution. Rokeach stipulated a mental continuum, with the “gestalt” types (those who do not fear uncertainty and have the capacity to resolve it) being at one end and the “psychoanalytic” types (those threatened by inconsistencies and new information) at the other end. Such differences,

Rokeach believed, were responsible for differences in problem-solving, authoritarianism, and religious dogmatism.

Kagan (1972) postulated that a principal motivator of human behaviour is the resolution of uncertainty. Other motives such as needs for affiliation and achievement play a secondary role, often acting in the service of the resolution of uncertainty (see also Hogg & Abrams, 1993). In accordance with this model, uncertainty resolution is conceptualized as an inconsistency between: (a) cognitive structures; (b) cognitive structures and behaviour; and (c) schemas and experience. Kagan (1972) argues that the experience of uncertainty motivates people to resolve the uncertainty. The theory of uncertainty orientation (Sorrentino & Short, 1986) integrates aspects of both theories, employing Kagan's belief that uncertainty resolution is a primary human motive, and Rokeach's (1960) notion that personality differences in cognitive-style orientations can account for differences in problem-solving and social behaviour.

Sorrentino and his colleagues (e.g., Sorrentino & Short, 1986; Sorrentino et al., 1984) have thus identified an individual difference dimension referred to as "uncertainty orientation." In general, this personality variable concerns how individuals deal with situational and personal uncertainty. In particular, the theory stipulates the situational parameters that are motivating for different personality types. According to this perspective, every situation is to some extent characterized by a degree of uncertainty or certainty, and that under conditions of uncertainty, people have the opportunity to learn new information about the self and the environment or be confused and perplexed. These notions embody informational aspects of situations, reflecting the extent to which the environment permits resolution of uncertainty about the self or the environment

(e.g., knowing vs not knowing). This is theoretically distinct from affective aspects of situations (e.g., feeling good vs feeling bad; see Raynor & McFarlin, 1986).

According to the uncertainty orientation theory, therefore, personality differences emerge in terms of how information is maximized. For those characterized as uncertainty-oriented (UO), uncertain situations are motivating, and uncertainty resolution directs cognition and behaviour. Such individuals are expected to approach uncertain situations and be positively engaged. Certainty-oriented (CO) individuals, however, are motivated where uncertainty resolution is not an aspect of the situation. Instead, the CO-personality is interested in maintaining clarity of the known, not resolving uncertainty, as uncertainty resolution could threaten the *status quo* of the individual's mental set. To the extent that a situation offers certainty and clarity of what is already known, COs will engage in that situation (Roney & Sorrentino, 1995a; Sorrentino & Roney, 1986; Sorrentino et al., 1984; Sorrentino, Hewitt, & Raso-Knott, 1992). This basic distinction is true to the degree that other motives are held constant. That is, differences in uncertainty orientation can interact with other motives (Sorrentino, Hodson, Roney, Walker, & Smithson, 1999). Thus, a certainty-oriented person would not approach a certain condition if other motives simultaneously exerted a strong negative influence (e.g., fear of failure, fear of social rejection). Likewise, an uncertainty-oriented person would not approach an uncertain situation in the face of similar negative motives. In general, however, UOs find positive information value in the resolution of uncertainty, whereas COs find positive information value in the maintenance of clarity (Sorrentino & Short, 1986).

Early Research Support for the Uncertainty Orientation Theory. Several studies have supported this personality distinction. In an early study, Sorrentino and Hewitt (1984) manipulated whether participants expected to receive personal feedback revealing low or high performance on an ability task. These researchers found that when given the opportunity to learn more about the self, UOs chose to construct tests with self-diagnostic items regardless of whether or not they were likely to be low or high on the ability diagnosed. COs, however, chose to select test items telling them little of their ability on a task, regardless of the positive or negative outcome that could be expected. This study demonstrates that UOs are motivated to resolve uncertainty about themselves regardless of the affective consequences of the feedback, whereas COs opt not to learn something new, also regardless of the affective consequences of the feedback.

In a series of experiments, Sorrentino and colleagues (Sorrentino et al., 1984; Sorrentino & Roney, 1986) have shown that achievement-related differences in behaviour (i.e., success-oriented vs failure-threatened) are found only when the situation is relevant to one's uncertainty orientation. That is, predicted achievement-related behaviours, where success-oriented individuals outperform failure-threatened people on tasks of intermediate difficulty, were found for UOs when situations were diagnostic (uncertain) and hence engaging. The achievement-related differences were found for COs when the situation was non-diagnostic (certain) and hence engaging.

Information-Processing Persuasion Models and Uncertainty Orientation. The uncertainty orientation theory proves interesting in tests of assumptions central to

contemporary information-processing models. As this is a major concern for the present dissertation it will be discussed in detail.

Most current and popular models of information-processing in the social cognition literature stipulate that people are cognitively motivated in uncertain and highly relevant conditions, evidenced by systematic and careful processing of information in order to maximize the information value of the situation. These contemporary models of persuasion have focused primarily on two popular theories, the Elaboration Likelihood Model (ELM; Petty & Cacioppo, 1981; Petty & Wegener, 1999) and the Heuristic-Systematic Model (HSM; Chaiken, 1980, 1987; Chen & Chaiken, 1999).

Central to these contemporary persuasion models is the notion of two qualitatively different routes to persuasion. The central (Petty & Cacioppo, 1981) or systematic (Chaiken, 1980) modes of processing are characterized by careful consideration of issues and the cognitive elaboration of points raised. Under conditions of high personal relevance or importance, individuals are believed to focus on (and elaborate upon) arguments used in the persuasion attempt. Both models contend that people strive for accuracy in attitudes and beliefs, and consequently will exert cognitive effort when suitably motivated and have the ability to do so. As such, in-depth processing requires more cognitive effort, and typically results in lasting attitude change and strong attitude-behaviour links (Eagly & Chaiken, 1993).

On the other hand, persuasion via the peripheral (Petty & Cacioppo, 1981) or heuristic (Chaiken, 1980) route is much less labour-intensive, embracing the tenets of the “cognitive miser” perspective (Fiske & Taylor, 1991). Generally speaking, people are interested in conserving mental energy and effort when processing information. As a

result, the ELM and HSM suggest that when personal relevance is low people will be influenced by factors outside of the message arguments. The ELM specifies that peripheral cues are factors influencing persuasion without analysis of the arguments *per se* (Petty & Cacioppo, 1986). Chaiken's (1980) HSM argues that heuristic processing will be dominated by the reliance on decision rules or heuristics ("rules of thumb"). Therefore, in a low relevance situation, unmotivated people should be primarily influenced by a peripheral cues (e.g., mood, attractiveness of speaker) or heuristic cues (e.g., "consensus implies correctness"; "experts are to be trusted"). However, Maheswaran and Chaiken (1991) have found that by presenting people with information that is incongruent with their expectations (based on consensus information), people in otherwise un motivating circumstances (e.g., low relevance) will increase their systematic processing. The authors assume that such inconsistent information reduces confidence in the use of heuristics, in a sense invalidating them, leading instead to the use of systematic processing. After all, both ELM and HSM argue that people are motivated to be accurate. Less deliberative processing is only an option when the topic is of less relevance.

Critical tests of these theories have focused on the prominence of each processing mode under a variety of situational conditions. For instance, the ability of an individual to differentiate between strong and weak arguments (and be more influenced by strong arguments) is taken as an indication that more careful, systematic, central processing has predominated. Hence, systematic processing typically results in greater persuasion by strong than weak arguments. Failure to distinguish between strong and weak arguments, therefore, is typically taken as an indication that careful processing has not occurred.

These studies have typically manipulated the presence or absence of possible heuristic cues to determine whether they are most influential in situations where careful processing does not occur (see Petty & Cacioppo, 1981; Petty & Wegener, 1999).

This dissertation will not address the independence and interdependence of these two basic routes (for reviews of this issue, see Chen & Chaiken, 1999; Petty & Wegener, 1999). Initially, these processing route differences were believed to exist along a continuum, where the presence of one processing form typically reflected an absence of the other. This was essentially supported by early research (e.g., Sorrentino et al., 1988). These models have since been expanded to posit a continuum with complex end points (vs discrete points), where both routes can be potentially independent, co-occurring phenomena.

Although these two models have much in common, they also differ in key respects (Eagly & Chaiken, 1993). For instance, the ELM's presentation of the peripheral route is much more general than the HSM's treatment of the heuristic route, where the former includes the latter but also includes other extraneous factors such as mood. While treating these models as roughly equivalent may not do justice to either theory, doing so will serve the purposes of the present investigation, as the distinctions are not relevant for the issues addressed here. The present investigation will use the term "systematic processing" to refer to careful, deliberative processing, and the term "heuristic processing" to refer to shallow processing based on decision rules and other extraneous factors.

Both the ELM and HSM have garnered considerable support over the years (for reviews see Chaiken, Wood, & Eagly, 1996; Chen & Chaiken, 1999; Eagly & Chaiken,

1993; Petty & Wegener, 1999). Sorrentino et al. (1988), however, have shown considerable qualifications of the predictions of the ELM and HSM models. In two studies, these researchers demonstrated that UOs (vs COs) act in accordance with these models, increasing careful information-processing under high (vs low) personal relevance, and increasing heuristic processing under low (vs high) personal relevance. In accordance with predictions, they found that COs are oppositely motivated, showing increased systematic processing under conditions of low relevance, and increased heuristic processing under conditions of high relevance, presumably as a means of dealing with uncertainty. More details on these studies will follow in a later section, as they are particularly relevant to issues discussed in Study 1. In general, however, we see a predicted and observed pattern where UOs are particularly motivated and engaged in relevant or diagnostic situations, and COs are motivated in situations of certainty (low diagnosticity or relevance), and increase their use of heuristics under conditions of relatively high uncertainty. Recently, interest in uncertainty orientation has shifted toward group processes and behaviour (e.g., Hodson & Sorrentino, 1997; Huber, Sorrentino, Davidson, Epplier, & Roth, 1992), and this focus is forwarded in the present dissertation.

Statement of the Problem

The primary concern of social identity theory centres on the role of self-esteem enhancement in intergroup contexts. Such enhancement is typically achieved via identification with an ingroup category imbued with positivity (Tajfel & Turner, 1979). Building on these initial ideas, self-categorization theory (Turner et al., 1987) specifies that one key goal of group life involves concerns with uncertainty (i.e., how groups provide meaning and structure). The most recent self-categorization angle, voiced by

Hogg and his colleagues, has argued that uncertainty is the key to group behaviour (Hogg & Abrams, 1993; Hogg, in press; Hogg & Mullin, 1999; Mullin & Hogg, 1998). Under this rubric, the process of becoming a group member, or more specifically, *identifying* with a social group, reduces subjective uncertainty.

In addition to discussing how groups reduce uncertainty, self-categorization theorists have proposed a mechanism responsible for the *creation* of uncertainty. That is, uncertainty arises primarily from disagreement with one's ingroup (Turner, 1985). This effect should be enhanced to the extent that one expects to agree with the ingroup on an issue that is important or relevant to inclusion in the group category.

To the extent that: (a) disagreement with an ingroup is an important source of uncertainty (Turner, 1985); (b) uncertainty reduction is the key to group behaviour (Hogg & Abrams, 1993; Hogg & Mullin, 1999); and (c) people are motivated to reduce uncertainty (Hogg & Abrams, 1993; Hogg & Mullin, 1999; Kagan, 1972; Trope & Liberman, 1996), typically by carefully processing information (Fiske & Taylor, 1991; Trope & Liberman, 1996), these characteristics of group behaviour appear more amenable to the uncertainty-oriented personality. That is, UOs (vs COs) should be the ones to more carefully process an ingroup message, particularly to the extent that the message is important and incongruent with expectations (i.e., where uncertainty is high). These individuals, after all, typically deal with uncertainty by confronting it directly. COs should deal with uncertainty by resorting to more shallow information-processing, shying away from deep processing and relying more on heuristics (see Sorrentino et al., 1988) relevant to group membership or group norms.

In a more general sense, these ideas represent the notion that group categories

should serve different functions for different personality types. Based on uncertainty orientation theory, one would expect UOs to find groups useful for purposes of self-assessment (i.e., as sources of information relevant to the resolution of uncertainty). COs, on the other hand, should find groups relevant for the purpose of self-verification (i.e., as subjective bases of perception, judgement, and behaviour).¹ These personality differences are likely accentuated to the degree that uncertainty in the situation is elevated and salient (see Sorrentino & Roney, 1999). Recall the basic premise of the uncertainty orientation theory --uncertainty leads UOs and COs to increase and decrease careful information processing respectively, where certainty has the opposite effect.

Related to this distinction, two key topics are tackled in this dissertation. Study 1 addresses how uncertainty based on social categorization influences the processing of persuasive messages. It is expected that UOs (vs COs) should more carefully process messages to the extent that uncertainty is created (i.e., message positions are incongruent with expectations). To the extent that the situation is characterized by certainty, COs should more carefully process information. When the situation and personality are “mismatched” (i.e., UOs under certainty, COs under uncertainty), shallower processing and use of heuristics should predominate. Study 2 extends these ideas into the domain of intergroup behaviour, addressing whether group members will use an ingroup category as a means to reduce uncertainty when they are uncertain about procedures for allocating resources between ingroup and outgroup recipients. To the extent that a minimal group can be used as a heuristic to deal with uncertainty without providing any diagnostic

¹ Deutsch and Gerard (1955) distinguish between normative influence (gaining acceptance, fulfilling expectations) and informational influence (reality based on information from others). The uncertainty orientation theory holds that personality differences would be *relative*, where UOs' interests focus on discovery and learning and COs' interests focus on stability and certainty.

information about the uncertainty itself, it is expected that high uncertainty will encourage COs (vs UOs) to show increased ingroup bias, reflected by resource allocation favouritism. Consistent with the predictions for Study 1, COs are expected to increase their use of heuristics under such conditions, which very well may manifest as a “*look out for your own group*” decision-rule.

CHAPTER II – STUDY I

As noted by Mackie and her colleagues (Mackie, Worth, & Asuncion, 1990; Mackie, Gastardo-Conaco, & Skelly, 1992), an ingroup category can influence information-processing in two very different ways. On the one hand, an ingroup category might serve as a heuristic cue (i.e., a judgement shortcut) concerning the validity of a message. That is, because ingroups are attractive to group members (Kelman, 1961; Pallack, 1983) and provide a socially-shared sense of reality (Festinger, 1950; Hardin & Higgins, 1996; Kelman, 1961; Turner et al., 1987), the ingroup category may play a heuristic role in persuasion. Indeed, supporters of social identity theory and self-categorization theory have indirectly argued that this is often the case (e.g., Abrams & Hogg, 1990; Turner et al., 1987). From this perspective, being “correct” in one’s judgement and belonging in a group become intertwined, so that the ingroup category provides an easy guideline for judging the acceptance of information and serves to define reality. According to Mullin and Hogg (1998), the most recognized explanation for ingroup favouritism under minimal group situations is the social identity theory position that “group members rely on the category label as a heuristic cue and identify with the minimal categorization” (p.346). This coincides with Kelman’s (1961) position that identifying with an ingroup increases the likelihood of message acceptance, where message acceptance may not be based heavily on message content. As Abrams and Hogg (1990, p.199) note, “it may be but a short step to argue that social categorization is also heuristic in that it specifies who should and should not be attended to for appropriate information.” Accordingly, self-categorization theorists argue that reliance on the group

category is an entirely reasonable and appropriate process under certain circumstances (e.g., Haslam et al., 1996).

On the other hand, Mackie and colleagues (1990, 1992) suggest that an ingroup category might promote the use of systematic information-processing. That is, information provided by an ingroup source might be considered to be more relevant to the individual (e.g., Festinger, 1950; Mackie et al., 1990, 1992). In keeping with current models of information-processing (e.g., Chaiken, 1980; Petty & Cacioppo, 1981), high personal relevance promotes the use of careful information-processing given that the resources and capability are present. In other words, individuals may more strongly distinguish between strong and weak arguments originating from ingroup than outgroup sources, this in turn affecting individual attitudes.

From a theoretical point of view, each perspective is highly plausible. Researchers have begun to address how group categories influence information-processing in persuasion settings. We now turn to a review of this literature.

Categorization and Message Persuasion: Theory and Research Review

According to both social identity theory and self-categorization theory, people should be generally more influenced by ingroup than outgroup norms and beliefs. That is, ingroups provide information to group members regarding which information is important and relevant for use by group members. Mackie (1986) examined the impact of categorization on group polarization, where individuals typically emerge from group discussion with more extreme views than they each held initially (see Burnstein & Vinokur, 1973). In Mackie's first study, participants were exposed to information from an alleged ingroup, outgroup, or uncategorized individuals. Polarization effects were

found only when participants believed that the information came from their ingroup, resulting in extreme ingroup opinions. This clearly demonstrates the power of the ingroup category on attitudes. These findings were replicated in Study 2, where manipulations designed to attenuate ingroup categorization processes (by having participants focus on interpersonal rather than intra- or intergroup issues) significantly decreased polarization of attitudes. Although these studies do not deal with the systematic vs heuristic processing issue, they clearly illustrate the power of ingroup influence in perception and behaviour, where ingroups are found to be more persuasive than outgroups.

Similarly, Abrams, Wetherell, Cochrane, Hogg, and Turner (1990) demonstrated that ingroup (vs outgroup) members are more influential in the formation of perceptual norms, where “people with divergent opinions [from the self] became much less persuasive when seen as a representative of an out-group” (p.116). Wilder’s (1990) research shows that although ingroups exert more social influence than do outgroups in both laboratory and existing groups, this effect disappears when outgroup members are individuated (i.e., presented in terms of individual rather than group identity). His explanation draws on two key lines of research proposing that: (a) outgroups are typically viewed in more homogeneous terms than are ingroups (Park & Rothbart, 1982; Wilder, 1986); and (b) people increase their use of central/systematic information processing when receiving messages from multiple (vs single) sources (Harkins & Petty, 1981a, 1981b, 1987). Thus, Wilder (1990) argues that ingroups (vs outgroups) are more persuasive and promote careful information- processing because ingroups are perceived as more individuated than outgroups, and that multiple (individuated) sources *per se*

increase the degree of systematic processing. This position seems to argue against a strict social identity theory or self-categorization theory explanation, where ingroup categorization is based on adherence to a coherent ingroup prototype (as opposed to a high degree of ingroup differentiation). Self-categorization researchers do, however, provide convincing evidence concerning the contextually dependent nature of the so-called “out-group homogeneity” effect, noting that ingroup homogeneity is actually found under appropriate social circumstances (Haslam et al., 1996).

To some extent, Mackie and colleagues (1990) can be credited with the recent interest in the role of categorization in the processing of persuasive messages. Recall that these researchers reasoned that ingroup messages might be processed heuristically (because ingroups are attractive and help define reality) or systematically (because ingroup messages are highly relevant and worthy of extensive scrutiny). In Study 1, their participants were assigned to read messages from an ingroup (a member of their university) or outgroup source (a member from another university). All messages were opposed to university entrance examinations (i.e., SATs) and contained eight arguments of strong or weak quality. Participants’ attitudes toward the topic were measured both before and after presentation of the arguments, and thought-listing data were collected. A main effect of argument source was found whereby ingroup messages exerted greater influence than did outgroup messages. A main effect of argument strength indicated that strong arguments were more persuasive than weak arguments. An interesting pattern revealed, however, that ingroup messages were processed systematically and that outgroup messages were processed heuristically. That is, participants were able to differentiate strong from weak ingroup messages, being more persuaded by strong

arguments. Strong and weak outgroup messages were equally non-influential.

Participants showed a marginally higher 'recall' (or reference to message facts) for ingroup (vs outgroup) messages. For ingroup sources, strong messages were rated more favourably than were weak messages. In addition, initial agreement with the ingroup message led to favourable ratings of the message but disagreement with it led to unfavourable ratings of the message. No such differences were noted for outgroup messages. Regression analyses revealed that message content favourability ratings predicted attitudes for ingroup but not outgroup messages, suggesting the presence of systematic information processing for ingroup messages. Ratings of source favourability (a supposed heuristic/peripheral cue from most social-cognitive perspectives) and accuracy of recall were not predictors for either ingroup or outgroup messages.

In Study 2, Mackie et al. (1990) examined whether relevance of the group category to the message influenced the implications of Study 1. Participants listened to audiotaped messages that were either highly relevant (oil-drilling near their city) or less relevant (acid rain problems far from their city) to their ingroup or outgroup identities, keeping the same ingroup/outgroup manipulations as in Study 1. The remainder of the procedure was similar to Study 1. The results indicated that the findings of Study 1 were limited to situations of high issue relevance. That is, people differentiated between strong and weak arguments only for ingroup (vs outgroup) messages, replicating Study 1, but only when the issue was relevant to the ingroup membership. When the issue was irrelevant to membership, participants showed a tendency to adopt the ingroup position regardless of argument strength, suggesting that the source was used as a persuasion cue (or was processed heuristically). Outgroup messages were ignored, regardless of

argument strength or issue relevance. As with the first study, content favourability ratings of ingroup messages predicted attitude change while source-related favourable thoughts did not.

Overall, therefore, Mackie and colleagues (1990) were able to demonstrate that ingroup messages were processed systematically while outgroup messages were processed heuristically, particularly to the extent that the issue was relevant to group membership. When the issue was irrelevant, ingroup messages were accepted regardless of strength of arguments, suggesting heuristic processing. In a related study, Mackie et al. (1992) examined whether the timing of the argument position presented by the ingroup or outgroup speaker influenced the manner of message processing. As was the case with the studies presented by Mackie et al. (1990), participants were exposed to strong or weak messages from an alleged ingroup or outgroup member. All messages were two-sided, and were not relevant to the categorization of the ingroup and outgroup. This made the group's position on the issue unknown to the participants. Prior position knowledge was manipulated so that participants were informed of the speaker's position on the topic either before or after the arguments were presented.

Mackie et al. (1992) reasoned that if ingroup categories promote systematic processing, then ingroup messages should be processed systematically (and hence message quality should be important) regardless of when the position was announced. If, on the other hand, the ingroup category serves as a heuristic, then presentation of the ingroup position at an early point could promote heuristic processing, while late position presentation could promote systematic processing so as to determine the position of the ingroup. The results indicated that group membership served as a heuristic cue when the

ingroup position was stated prior to argument presentation, but not when the position was stated after the argument presentation. Recall that in this study, participants did not have an idea of the group's position based on membership. They presumably systematically processed information in the latter condition to determine the group's position. Not only did prior ingroup position-knowledge breed lack of discrimination between strong and weak ingroup messages, but participants took marginally less time to read these messages, supporting the idea that heuristic processing occurred. Oddly, significant attitude change for those exposed to the attitude position prior to message delivery was found only when the issue position was counterattitudinal to the participant. This study suggests, overall, that ingroup messages can invoke either heuristic or systematic processing, depending on the nature of the situation.

Van Knippenberg and Wilke (1992) claim to corroborate the research by Mackie and colleagues (1990, 1992).² Before discussing the research by Van Knippenberg and colleagues, however, a potential source of confusion should be addressed. Put simply, these researchers predict that ingroup messages result in systematic information processing. Their data, however, predominantly point to the opposite conclusion, although the researchers adhere to their initial belief in the systematic processing of ingroup messages. Examination of the following studies will bear witness to this occurrence.

Van Knippenberg and Wilke (1992) examined whether influence by an ingroup source would be greater to the extent that the message presented was prototypical of the

² A study by Van Knippenberg and Wilke (1991, reported in Van Knippenberg & Wilke, 1992) also claims to support this prediction, where ingroups result in a differentiation between strong and weak arguments. As the paper was written in Dutch, however, details will not be discussed in this paper.

ingroup (i.e., if the message supported participants' expectations of the ingroup position). In Experiment 1, participants read either strong or weak arguments from an alleged ingroup source on the issue of university entrance exams. Participants read one of two sets of arguments, one where the speaker opposed such exams (which was conceptualized as being prototypical of the ingroup position) or in favour of them (the non-prototypical ingroup position). In a sense, a prototypical message could be conceived as an expected argument, and a non-prototypical message as unexpected, based on group membership. This point is an important element in the present study, and will be elaborated later. In support of the hypotheses, participants' attitudes were more influenced by ingroup messages when the messages were ingroup-prototypical than ingroup-non-prototypical. However, no effects of argument quality were found, questioning whether systematic processing occurred (see Chen & Chaiken, 1999; Petty & Wegener, 1999). Although participants were more favourable toward prototypical arguments, and recall of (or reference to) such arguments was increased, prototypical ingroup arguments did not lead to increased cognitive elaborations.

In a follow-up study, Van Knippenberg and Wilke (1992, Expt 2) included an outgroup message source (government employees) in their design, and exposed participants to either a prototypical or non-prototypical message. Group norms, either for or against the exams, were explicitly stated. The researchers again predicted more systematic processing of ingroup than outgroup messages, especially when the ingroup messages were prototypical. Other aspects of the study closely resembled their Study 1. Results indicated that participants conformed more to ingroup messages, particularly when they were prototypical, while outgroup messages did not influence attitudes. As

reported in their first study, no effects of message quality were found. In addition, there was “no indication of higher elaboration of (prototypical) ingroup arguments” (Van Knippenberg & Wilke, 1992, p.150). Moreover, unlike Experiment 1, prototypical ingroup arguments were not rated as being of higher quality by participants, attributed by the authors to a low degree of elaboration in general. Thought-listing data revealed that most cognitive elaboration was found for strong ingroup arguments and weak outgroup arguments. Regression analyses revealed that the only “systematic” processing of information, characterized here by increased cognitive elaborations of message content-related arguments, occurred for prototypical ingroup arguments.

Overall, however, the results of Van Knippenberg and Wilke (1992) present questionable evidence that (prototypical) ingroup categories promote careful processing. What these studies clearly show is the strong influence of ingroups, particularly prototypical ingroups, where attitudes expressed are consistent with expected ingroup norms. Conclusions based on these studies require a note of caution, however, due to the absence of argument scrutiny in either study. This casts doubt on the nature of “systematic processing” reported by the researchers. In addition, prototypical ingroups did not cause increased cognitive elaborations in Experiments 1 and 2, and in Experiment 2 participants did not rate prototypical ingroup messages as being of higher quality than did those in other conditions.

In a similar vein to Mackie et al. (1992), Van Knippenberg, Lossie, and Wilke (1994) examined the impact of knowledge of a source’s attitude position *prior* to the delivery of the message. Specifically, Van Knippenberg and colleagues predicted that prior knowledge of both the ingroup’s position, plus knowledge that the position is

prototypical of the ingroup, might lead to message acceptance regardless of message quality. In short, the ingroup might serve as a heuristic in determining influence. The issue of university entrance exams was again employed (see also Mackie et al., 1990, 1992; Van Knippenberg & Wilke, 1991, 1992) as the attitude topic. Participants received strong or weak arguments from a prototypical or non-prototypical ingroup delegate (based on the delegate's position on another attitude topic), with some participants being informed of the attitude position prior to the message presentation. The messages received were either favourable or unfavourable toward the exams. As expected, prototypical ingroup sources were more persuasive than were non-prototypical sources. However, as was the case with Van Knippenberg and Wilke's (1992) other two studies, no differentiation was found between strong and weak arguments. Analyses of the thought-listing data, however, reveal that more cognitive elaborations were associated with prototypical ingroup messages, particularly when participants were not given knowledge of the attitudes prior to message exposure. The findings are in accordance with predictions, as fore-knowledge of the ingroup's attitude position could (and apparently did) serve as a heuristic in determining acceptance of a persuasive message.

The studies by Van Knippenberg and Wilke (1992, Expts 1 and 2) and Van Knippenberg et al. (1994) only provide very limited support for the notion that ingroup messages promote systematic processing. There are some notable gaps in the story. First and foremost, each of these three studies failed to show differentiation between strong and weak arguments in any of the experimental conditions where it was expected to occur. The 'evidence' for systematic processing was based solely on cognitive elaborations found in the thought-listing data. A clearer test of the presence of systematic

processing is arguably the presence of message scrutiny as opposed to simply showing more favourable thoughts toward a message when it comes from a particular source. In fact, a reasonable conclusion to be drawn from these findings is that (prototypical) ingroups are more influential than non-prototypical ingroups or outgroups, and that, given the lack of argument scrutiny coinciding with an increased favourability of these messages, ingroup categories were used as favourable heuristics. This interpretation is particularly reasonable considering that Van Knippenberg and Wilke (1992, Expt 2) did not find prototypical ingroup messages to be rated as higher quality by group members. Hence the authors' conclusions concerning their findings appear to be the exact opposite of what their data actually show. Another limitation is the fact that for two of the three studies (Van Knippenberg & Wilke, 1992, Expt 1; Van Knippenberg et al., 1994), no outgroup comparison was provided. Third, the covariation of pre-exposure attitudes in all three studies renders an examination of personal attitudes impossible.

Two studies conducted by McGarty, Haslam, Hutchinson, and Turner (1994) were based loosely on the procedure employed by Mackie et al. (1990). McGarty and colleagues took exception to (their interpretation of) the ELM and HSM assertion that "group memberships tend to be associated with unthinking influence" (p.269), otherwise referred to as the heuristic or peripheral routes of processing. Consistent with observations made by Mackie et al. (1990), McGarty et al. (1994, p.269) claim that "the elaboration likelihood model adopts an approach... [where] group-mediated communication is seen as being less objective, and involves less extensive content-related processing." Incidentally, Petty and Wegener (1999) contest such interpretations of these models. Nonetheless, McGarty and colleagues predicted that ingroup messages should

be more persuasive than outgroup messages, with this difference being enhanced under high category salience. In Experiment 1, participants watched a videotaped speech concerning a health issue. Group membership was “manipulated” by having the speaker present an opinion that was likely to be acceptable to the participants (ingroup category), or unacceptable (outgroup category). Under high salience conditions, participants indicated their initial agreement with the position prior to message exposure, while no such ratings were made for low salience conditions.

As expected, McGarty et al. (1994) found increased persuasion for ingroup than outgroup messages, particularly under high salience conditions. Interestingly, no differences were found between ingroup low vs high salience conditions. That is, the interaction was driven by disagreement with outgroup sources under high salience conditions (although they did not derogate the outgroup speaker), which is presumably unexpected by self-categorization theory. Experiment 2 added an indirect (i.e., subtle) salience condition to the design, where some participants were led to believe that they would see both ingroup and outgroup positions, while actually receiving only one or the other, making categorization salient without promoting commitment to the group. As in Experiment 1, ingroups were more persuasive than outgroups, but again only when category salience was high (i.e., direct, not indirect). Again, decrease in outgroup persuasion under high salience drove the interaction. This effect was accompanied by increased reference of message content under the high salience condition, possibly signalling systematic processing of information.

The McGarty et al. (1994) studies are important because they demonstrate that group categorization can influence message persuasiveness. The researchers believe that

outgroup messages are considered to be less relevant to the audience member, because they are less important in defining reality. They conclude that “persuasion by the ingroup does not have the characteristics ascribed to the peripheral route under conditions where group memberships are salient” (McGarty et al., 1994, p.287). The authors argue that, because decreased outgroup persuasion was unaccompanied by outgroup derogation in the high salience conditions, “group influence [is] a *thoughtful* process. It is not the case that the ingroup is simply accepted and the outgroup rejected without the message being processed” (p.279 [emphasis added]).

The conclusions reached by McGarty et al. (1994) are questionable however. First, there was no strong test of heuristic-systematic processing (cf. Mackie et al., 1990, 1992). That is, participants were not given the opportunity to distinguish between strong and weak arguments, or show other evidence of systematic processing. For instance, under the key experimental condition showing ingroup-outgroup differences, mediational analyses revealed that “the relationship between group membership and [attitude] agreement was *not attenuated* when group membership and log number of [cognitively elaborated] arguments were used as predictors of agreement” (McGarty et al., 1994, p.285 [emphasis added]). The researchers consistently found more agreement with the “ingroup” position, which provides little insight into the heuristic vs systematic issue (or, may even point more toward heuristic processing). In addition, social categories were not manipulated (unlike Mackie et al., 1990, 1992), rendering conclusions about social categories limited.

By conceptualizing an ingroup category as message agreement and outgroup category as message disagreement, McGarty et al. (1994) could not investigate the effects

of message agreement separately from group categorization. These researchers not only confounded categorization and attitude position, but treated them as equivalent. Thus, one could easily reinterpret their data from a non-groups perspective. That is, these data might simply suggest that when one agrees with a speaker (their “ingroup” condition), prior commitment to an attitude position does not influence subsequent attitudes, whereas when disagreeing with a speaker (the “outgroup” condition), prior commitment to an attitude position might lead to further rejection of the message after the communication. This explanation has little to do with group behaviour, but is rather a direct attitude issue. The very fact that the outgroup was not derogated suggests this interpretation; participants were not acting at the group level, but were simply more opposed to an attitude position after already committing to their disagreement prior to hearing the message exposure. Given these considerations, these studies and their interpretations should be evaluated with caution in the present context of examining the role of group categorization in the processing of persuasive messages.

More recently, Budesheim, Houston, and DePaola (1996) conducted two studies examining the effects of “negative-campaigning”, or attacks against a political opponent. The authors manipulated the argument source (ingroup vs outgroup) and the justification accompanying the attack message. For instance, participants were either exposed to attacks that were issue-relevant, character-relevant (i.e., personal), issue- and character-relevant, or integrated (similar to the previous condition except that issue and character attacks were integrated to justify the attack). Consistent with the findings of Mackie and colleagues (1990, 1992), participants engaged in more systematic processing of ingroup than outgroup messages. Specifically, ingroup messages were persuasive only if the

justifications were clear and issue-based, indicating that distinctions were made between strong and weak arguments from ingroups. Contrary to the expectations of Budesheim and colleagues and the findings of Mackie's research group, however, was the finding that outgroup messages were also subjected to some degree of systematic processing. That is, participants did not flatly reject outgroup messages, but rather were influenced by the justifications that accompanied these messages. As the authors point out, ingroup messages were simply held up to a higher criterion than were the outgroup messages, and were more severely rejected if they failed to reach that standard. Budesheim et al. (1996, p.532) contemplate that the categorization-processing issue is perhaps more complex than initially assumed, and that "the best conclusion may simply be that messages from ingroup sources were processed relatively more systematically than were messages from out-group sources."

This perusal of the research literature reveals that social categorization effects on information-processing are interesting yet unresolved. There is an intuitive appeal to each side of the argument. After all, an ingroup category might be used as a heuristic cue (as a source of reality and a guideline for making judgements), or as a source of motivation leading to careful processing of information (due to the high relevance of ingroup categories and their messages). Two key pieces of the puzzle appear to be missing. First, the extent to which a group member finds that he or she agrees or disagrees with an ingroup or outgroup position should influence message acceptance.³ The second issue concerns the characteristics of the audience members independent of their social identities. This can be addressed directly by the theory of uncertainty

³ Mackie et al. (1990) found few effects for this factor and discussed it in footnotes primarily.

orientation. We shall now turn to each of these issues in turn.

Social Categorization as a Source of Uncertainty

As the literature review attests, one's ingroup is a powerful source of social influence. As such, the ingroup serves as a powerful mechanism for the creation and reduction of uncertainty; the latter issue is the focus of Study 2 of this dissertation and will be addressed in detail at a later point. Festinger (1950, 1954) argued that people use both their physical and social environments to test conceptions of reality, typically employing social tests when the physical context is ambiguous. Recent formulations of social influence theories suggest that a general sense of reality (i.e., both physical and social) is developed via social processes, namely consensus with (perceived) similar others (Hardin & Higgins, 1996; Moscovici, 1976; Turner, 1985).

Given the assumption that conceptions of reality can be socially mediated, violations of socially-based expectancies can result in uncertainty. According to Turner (1985, p.276), therefore, people:

become uncertain because they disagree with people with whom they expect to agree and hence the disagreement is a puzzling problem that has to be explained in some way... They expect to agree because they have categorized the others as similar or identical to themselves (interchangeable, equivalent) in terms of the attributes perceived as relevant to making a sound judgment... If similar perceivers confront the same stimulus, then they *ought* to agree. This is a natural and rational expectation [emphasis in original].

Research by Abrams et al. (1990) supports this proposition using the Asch (1956) paradigm, where participants are exposed to a consistent and unanimous opinion by a group of confederates regarding the judgement of a clearly unambiguous physical stimulus. Typically, a large proportion of individuals (roughly one-third) are significantly influenced by such social influence and report perceptual judgements

consistent with those of the confederates. Abrams et al. (1990, Expt 2) manipulated categorization so that confederates represented members of the participants' ingroup or outgroup. As predicted, the researchers found that disagreement with one's ingroup (vs outgroup) created uncertainty in participants' personal judgements, resulting in increased conformity to the confederates. The authors concluded that "greater uncertainty, and hence influence, arises from a group defined as similar (and thus attractive to) self than from one defined as different (thus unattractive)" (Abrams et al., 1990, p.109). McGarty, Turner, Oakes, and Haslam (1993) have also found that subjective uncertainty is associated with disagreement with similar others (Expts 1-3), while subjective certainty is associated with agreement with similar others (Expts 2 & 3). Orive (1988) found that uncertainty and negative arousal were only created when a similar (vs dissimilar) other disagreed with them. He also found, interestingly enough, that agreement with a dissimilar other led to positive affect and increased confidence (see also Goethals & Nelson, 1973).

This body of research suggests that disagreement with an ingroup member can create uncertainty and social influence. But do people naturally expect to agree with ingroup members and to disagree with outgroup members? Tajfel, Sheikh, and Gardner (1964) found that participants rated group members as more similar to one another on group-defining than non-group-defining characteristics. Following this logic, one should expect oneself to be more similar to one's ingroup members than one's outgroup members, particularly on traits that are important for group definition. Ross, Greene, and House (1977) refer to the overestimation of (ingroup) consensus as the "false consensus effect." Mullen, Dovidio, Johnson and Copper (1992) found that participants

demonstrated false consensus for ingroups more than for outgroups (Study 1), false consensus for ingroups but false uniqueness for outgroups (Study 2), and that this latter effect persisted even when there was no personal investment in the attitude topic (Study 3). Research by Allen and Wilder (1979, Expts 1 & 2) demonstrates that people expect ingroup members to be similar to the self and outgroup members dissimilar to the self, even when categorization is based on the minimal group paradigm. Wilder (1984) corroborated these findings, noting that these perceptions of similarity to the ingroup and dissimilarity to the outgroup were limited to topics related to the basis of categorization.

People therefore expect to agree with their ingroup, and uncertainty can be created through disagreement with others with whom a group member expects to agree (i.e., ingroup members). This may be particularly true to the extent that the topic of agreement is central (or relevant) to the basis of categorization (Turner, 1985; Wilder, 1984). That is, a member of the Progressive Conservative political party would expect more agreement with fellow party members on a topic of key importance to party membership (e.g., attitudes toward social welfare) than on a topic unrelated to group membership (e.g., attitudes toward chocolate ice cream). Using this logic, therefore, a student should expect more agreement with an ingroup member (another student at the same university) on an issue related to group membership (e.g., implementation of comprehensive exams at the university) than with an outgroup member. Attention to the role that social categorization can play in the creation of uncertainty should help to shed light on the issue of categorization, social influence, and information-processing.

Uncertainty can, of course, be derived through mechanisms other than social identification. Kagan (1972) broadly operationalizes uncertainty as conflict between cognitions, cognitions and behaviours, or the inability to predict future events.

Expectancy violations represent one type of cognition conflict (see Olson, Roesse, & Zanna, 1996; Trope & Liberman, 1996), where conflict with an expectation can lead to uncertainty by reducing confidence in the belief structure. Such expectations need not be based on group membership. The social identity and self-categorization perspectives adopt a much narrower conceptualization of uncertainty, based on disagreement with ingroup members (a type of expectancy violation). In Study 1 of this dissertation, this narrow definition of uncertainty is employed. In Study 2, the uncertainty is based on a lack of knowledge relevant for task completion. This latter form of uncertainty is not based on expectancy violation, but rather on an experience with a novel stimulus. The uncertainty orientation conceptualization of uncertainty, based on Kagan's ideas, represents a very broad notion of uncertainty that subsumes many of the more specific sources of uncertainty listed above, and addresses how uncertainty influences behaviour across contexts and domains.

Uncertainty Orientation, Categorization, and Message Processing

The second issue to be addressed is the role of individual differences in the recipients of persuasive messages. As argued by Huber and Sorrentino (1996), many contemporary models of social cognition are limited in their assertion that all or most people are rational information processors. In short, they argue that these theories only tell half the story, describing the uncertainty-oriented personality -- the type of people who carefully processes information and are engaged in situations allowing for learning

and discovery of the self and the environment. As Huber and Sorrentino note, theorists promoting these models assume that most people are uncertainty-oriented, like most ivory-tower “inhabitants.” This is a questionable assumption. In contrast, Sorrentino, Raynor, Zubek and Short (1990) suggest that the general population tends to be more certainty-oriented than uncertainty-oriented.

In a test of these ideas, Sorrentino et al. (1988) conducted two studies examining how uncertainty orientation moderates information-processing underlying attitude change. The authors found that uncertainty-oriented (UO) and certainty-oriented (CO) people demonstrated different responses to persuasion attempts as a function of the personal relevance of the situation. UOs typically are more motivated by personally relevant situations (because these provide high potential for learning something new about oneself), whereas COs typically are more motivated in situations low in personal relevance (because there is little likelihood of challenging existing self views). In accordance with contemporary persuasion theories, UOs in Experiment 1 were found to be more persuaded by two-sided arguments than one-sided arguments under conditions of high relevance than low relevance, demonstrating systematic processing in these conditions. Interestingly, the opposite effect was noted for the COs, who were more persuaded by two-sided arguments when the situation was less relevant to the self than when highly relevant to the self. The authors argue that COs are more motivated to critically process information (and consider ambiguity) when the situation is less relevant to the self.

In Study 2, Sorrentino et al. (1988) manipulated the quality of the arguments presented. Participants read either 6 strong or 6 weak arguments in favour of instituting

comprehensive exams for undergraduates from an alleged expert or non-expert source. These arguments were adapted from Petty and Cacioppo (1984). As in Experiment 1, the changes were proposed to occur within 5-10 years (low relevance) or 1-2 years (high relevance). UOs again acted in accordance with predictions prevalent in the social cognition literature, being more influenced by strong than weak arguments under high than low situational relevance. The opposite trend was noted for the COs, where the increased persuasion of strong over weak arguments was more pronounced under low than high relevance conditions. In addition, UOs were more influenced by expert than non-expert sources when the situation was less relevant, but COs were more influenced by the expert source than non-expert source under high than low relevance conditions. Hence, in a relevant situation, a CO often turns to a heuristic for help in determining the validity of a message. Analysis of the thought-listing data revealed that for UOs, favourable thoughts about the message predicted attitude change only in the high relevance condition, but for COs favourable thoughts about the message predicted attitude change only in the low relevance condition.

A study by Brouwers and Sorrentino (1993) clearly demonstrates the extent to which COs avoid high levels of uncertainty. Participants were given information about a fictitious disease, and the researchers manipulated the threat potential of the disease (low vs high likelihood that participants were at risk) and the efficacy of a test in terms of diagnosing the disease (low vs high). UOs acted in accordance with protection motivation theory (Rogers, 1983), seeking out the most health-related information when both threat and test diagnosticity were high. COs, however, sought more information when either threat or diagnosticity were high, but not when both were high. Most

interestingly, COs (vs UOs) reported greater reliance on God to help them with diseases, and held strong beliefs concerning the role of fate. COs thus deal with uncertainty by relying on “others” and external factors. Even under life-threatening situations, therefore, COs do not want to directly confront or attend to diagnostic or highly uncertain information.

Such deference to experts, God, and the “hands of fate” by COs in the face of uncertainty is consistent with their general tendency to hold black-and-white views of others and social categories. Roney and Sorrentino (1987) tested whether UOs and COs differed in how they conceptualize person categories. The first task required participants to classify particular “person” categories (e.g., “rapist”, “nun”) under more general “superordinate” categories (e.g., “emotionally unstable person”, “extraverted person”). In the second task, participants listed trait adjectives that applied to members of four person categories (“unemployed person”, “business executive”, “housewife”, “student”). As expected, COs showed more differentiated and less descriptively rich social categories than UOs. Specifically, COs placed fewer person categories under the superordinate categories, and showed greater perceived differentiation between these higher-level categories than did UOs. On the second task, COs used fewer traits in describing the particular person categories, meaning that their categories were less “rich”, and they showed more differentiation between categories (evidenced by a marginally greater tendency to show less overlap in traits common to different categories). In accordance with the uncertainty orientation model, therefore, it appears that COs compromise category richness for clarity, evidenced by greater differentiation

between categories, and resulting in a greater propensity for use of “black and white” categorical thinking about social groups.

Study 1 - Rationale and Hypotheses

To this point, several issues of importance to the present study have been addressed. First, contemporary models of information-processing propose two routes of persuasion, one systematic (or central) and the other heuristic (or peripheral). Second, there is much support for the notion that ingroups are highly relevant to group members (e.g., Budesheim et al., 1996; Festinger, 1950; Heider, 1958; Mackie et al., 1990, 1992; Turner et al., 1987) and generally more influential than outgroups (Abrams et al., 1990; Expts 1-3; Mackie, 1986; McGarty et al., 1994; Van Knippenberg & Wilke, 1992, Expts 1 and 2; Van Knippenberg et al., 1994; Turner, 1991). This raises the possibility that ingroup categories can be used as judgement heuristics (see Abrams & Hogg, 1990; Kelman, 1961).⁴ Working against a heuristic explanation is the fact that some studies find more systematic processing of ingroup than outgroup messages (Mackie et al., 1990, 1992; Van Knippenberg & Wilke, 1991), yet not under all conditions (Budesheim et al., 1996; Mackie et al., 1990, Expt 2; Mackie et al., 1992). However, some of the evidence favouring the systematic processing of ingroup messages is rather weak (particularly Van Knippenberg & Wilke, 1992, Expts 1 & 2; Van Knippenberg et al. 1994), because these studies fail to find differential evaluation of strong and weak message arguments. In fact, these latter studies may actually support the position *opposite* to the conclusions reached by the researchers (i.e., that ingroups promote systematic processing). Given that ingroup messages exert greater influence than

⁴ In fact, the Abrams et al. (1990) paper is entitled “Knowing what to think by knowing who you are: Self-categorization and the nature of norm formation, conformity and group polarization.”

outgroup messages, often in the absence of argument scrutiny, it is certainly possible that ingroup categories serve as heuristic cues. The issue is obviously far from resolved.

Examining the cognitive styles of the group members receiving messages might reveal some insights. That is, individual differences in uncertainty orientation should influence how a group member processes information from an ingroup or outgroup source. Recall that for UOs, strong arguments are more influential than weak arguments under high than low relevance, suggesting more systematic processing under more personally relevant and diagnostic conditions (or high uncertainty). For COs, this difference is greater under low relevance (or high certainty) conditions (Sorrentino et al., 1988). For COs, increased relevance of the situation is associated with a higher reliance on heuristic processing and a decreased reliance on systematic processing, presumably as a means to deal with the uncertainty.

Social categorization can create uncertainty when we find that we disagree with our ingroup (Abrams et al., 1990; McGarty et al., 1993; Turner, 1985). Past research demonstrates that we expect a high degree of similarity between our attitudes and those of our ingroups, and strong dissimilarity of our attitudes with our outgroups (Allen & Wilder, 1979; Orive, 1988; Tajfel et al., 1964; Turner, 1985; Wilder, 1984). *An uncertain context can therefore be conceptualized as one that is incongruent with expectations based on social categorization.* Importantly, uncertainty reduction has emerged in the literature as a key determinant of group behaviour (Hogg & Abrams, 1993; Hogg & Mullin, 1999). The personal importance of ingroup categories may result in careful processing of ingroup messages (Mackie et al., 1990, 1992), presumably due to the implications for the self and in the interest of dealing with uncertainty.

Hypotheses. To the extent that these propositions are correct, it is predicted that UOs will process information more systematically, reflected by increased scrutiny of arguments (increased favourability toward strong than weak arguments) under relatively high uncertainty conditions -- when disagreeing with the ingroup and agreeing with the outgroup. Under conditions of relative certainty (i.e., agreement with the ingroup, disagreement with the outgroup), UOs should process information more heuristically, showing less differentiation between strong and weak arguments.⁵ These predictions are directly based on persuasion studies by Sorrentino et al. (1988). They are also in keeping with the findings of Driscoll, Hamilton and Sorrentino (1991), where UOs (vs COs) showed a marked advantage in the recall of expectancy-incongruent (vs expectancy-congruent) information, suggesting an increase in the processing of the incongruent information. As predicted by the heuristic-systematic model, Maheswaran and Chaiken (1991) found that participants faced with incongruent information (i.e., that conflicted with consensus information) showed increased systematic processing, particularly to the extent that they were in conditions that otherwise did not foster systematic processing. This presumably reflects diminished confidence in the validity of heuristic or shallow processing. That is, heuristic processing would be unacceptable under these circumstances, particularly for UOs. According to the findings of Sorrentino et al. (1988) and Driscoll et al. (1991), an increase in systematic processing when faced with incongruent information (i.e., an uncertain situation) should therefore

⁵ Initially, these strong vs weak differences were predicted for UOs under ingroup conditions generally, as it was assumed that the majority of the students would hold negative attitudes about the comprehensive exams, and that the ingroup attitude would be counterattitudinal and thus high in uncertainty. However, it was soon discovered that there was an equal split in initial attitudes. As a consequence, predictions were expanded to accommodate this finding, and initial attitude position was incorporated into the design. These revised predictions are entirely consistent with the initial arguments put forth.

apply more to the UO personality.

Following the uncertainty orientation model, COs should behave in a manner opposite to UOs. That is, COs are expected to show increased reliance on systematic processing under certain than uncertain conditions, and increased use of heuristic processing under uncertain than certain conditions. Such behaviour would manifest itself as careful argument scrutiny (favouring strong over weak arguments) under conditions of certainty (i.e., agreeing with ingroup, disagreeing with outgroup), and less careful processing under conditions of uncertainty.

Method

Dissertation General Overview

There are two phases to the research in this dissertation. In Phase I, participants completed personality measures and an initial attitude measure used for Study 1. In Phase II, participants were tested individually, and partook in Study 1 followed by Study 2. These two studies have different methodologies and research objectives. The experimental manipulations imposed and dependent measures collected in Study 1 did not influence the principal results of Study 2.⁶

Participants

Introductory psychology students at the University of Western Ontario (London, Canada) enrolled for a study entitled “Social Judgements, Campus Issues, and Questionnaire Inventory” in partial satisfaction of course requirements. Phase I involved 231 participants, 223 of whom returned for Phase II. Of those who failed to return for Phase II, three were COs, three were UOs, and two were moderates. Of the returning participants, four (all UOs) were omitted from analyses because they showed strong identification with the University of Ottawa (jeopardizing the ingroup-outgroup distinction necessary for the study), nine (four COs, five UOs) were omitted because they failed to pay attention, demonstrated a lack of understanding of the issue, or admitted failure to take the task seriously, and one (UO) was suspicious of the experimental hypotheses. Two participants (one CO, one moderate) failed to provide an initial rating of

⁶ The participants' Source condition, $F(1,135)=.00$, $p<.998$, Argument Quality condition, $F(1,135)=2.58$, $p<.110$, and Position condition, $F(1,146)=.76$, $p<.386$, from Study 1 did not serve as significant covariates for the results of Study 2. In a separate analysis, each participant was given a code (from 1 to 16) representing his or her experimental cell from Study 1. This variable was not a significant covariate in Study 2, $F(1,137)=.72$, $p<.397$.

their attitudes toward comprehensive exams in Phase I, and hence could not be classified as counter- or pro-attitudinal. This left a total of 69 COs, 65 UOs, and 72 moderates. Due to the fact that moderates are not typically employed in statistical analyses for both theoretical and empirical reasons (see Sorrentino & Short, 1977), 134 participants (33 men, 101 women) were used in the principal analyses.

Phase I: Mass-Testing

Participants were mass-tested in groups of 3-20 in Phase I and tested individually in Phase II. The measures, consent, and debriefing forms are found in Appendix A.

Personality Assessment. The principal purpose of the mass-testing session was to collect data necessary for personality assessment. The procedure followed the guidelines stipulated by Sorrentino, Roney and Hanna (1992). The resultant measure of uncertainty orientation was derived from the scores of: (a) a projective measure, from which the need to approach and resolve uncertainty (nUncertainty) is inferred; and (b) the Cherry and Byrne (1977) acquiescence-free measure of authoritarianism, from which orientations toward certainty are inferred, given that high authoritarians align themselves with situations that involve certainty (Kirscht & Dillehay, 1967). The projective measure assesses the chronic accessibility of a schema (Sorrentino & Higgins, 1986) without being overly influenced by demand characteristics. Past research has demonstrated the orthogonal nature of these two components (see Hodson & Sorrentino, 1999; Sorrentino et al., 1984; Sorrentino et al., 1990), meaning that an individual can be low or high on one or both of these tendencies. In the present sample, the variables were again unrelated ($r = -.06$, ns). Thus, UOs are both high in nUncertainty and low in authoritarianism, COs are both low in nUncertainty and high in authoritarianism, and moderates are those high

or low on both dimensions simultaneously. The use of two orthogonal components is akin to procedures employed by Atkinson (1964; Atkinson & Feather, 1966) in dealing with achievement motivation. The resultant measure allows more precision than does a single measure, as it adjusts for those who are low or high on both tendencies (Sorrentino, Roney, et al., 1992).

The nUncertainty measure taps concerns relevant to resolving uncertainty and achieving clarity about the self and the environment. In accordance with procedures advocated by Atkinson (1958) and adapted by Sorrentino, Roney, et al. (1992), participants were instructed to generate four stories in response to presented sentence leads (“Two people are in a laboratory working on a piece of equipment; “A person is sitting, wondering about what may happen...”; “A young person is standing: an operation can be seen in the background”; “A person is thinking: an image of a crossroads is in the person’s mind”). Participants were prompted to answer questions about the story (“What is happening? Who is (are) the person (s)”; “What has lead up to this situation? That is, what has happened in the past?”; ““What is being thought? What is wanted? By whom?; “What will happen? What will be done?” Each sentence lead was presented for 20 seconds, followed by a 4 minute interval to write the stories.

Detailed guidelines for scoring nUncertainty are found in Sorrentino, Roney et al. (1992). In brief, uncertainty imagery is scored if a story concerns the attainment of an outcome of doubtful likelihood, a statement of curiosity, or an incompatibility between ideas, or between ideas and experiences. To the extent that a story character approaches or resolves the uncertainty, uncertainty imagery is scored. For each story, scores can range from -1 to 11. A total nUncertainty score was derived by aggregating the imagery

scores across the four stories. Interrater reliabilities for the measure above .90 are typical (Hodson & Sorrentino, 1997; Sorrentino, Roney et al., 1992). In the present investigation, scoring was conducted by a trained expert who reached reliability above .90 with materials in the scoring manual (Sorrentino, Roney et al., 1992) and with another expert scorer. Although low test-retest reliability is often found for such Thematic Apperception Tests (TAT) measures (see Smith, 1992), obtained values likely underestimate the true reliability. Winter and Stewart (1977) and Heckhausen (1963, cited in Smith, 1992) found that instructions to participants to avoid being concerned with repetition during the second testing session raised test-retest reliabilites above .53. Meta-analyses by Spangler (1992) support the use of projective measures. He found greater predictive validity for projective over self-report measures, particularly when predicting long-term (vs short-term) behaviour.

After completing the projective measure, participants were administered the self-report measure of authoritarianism (Cherry & Byrne, 1977). This is a 21-item test, scored on a 6-point rating scale, with high scores being indicative of high authoritarianism. A sample item is: "The sooner people realize that we must get rid of all the traitors in the government, the better off we'll be." Both men and women have shown test-retest reliabilities above .90 on this measure (Sorrentino, 1977).

A resultant uncertainty orientation score was derived for each participant by subtracting their standardized authoritarianism score from their standardized Uncertainty score. A tertile split of the resultant uncertainty measure categorized individuals as being UO, CO, or of moderate orientation.

Attitude Measures. Participants were administered a 10 item general attitude questionnaire (9-point rating scales). The majority of the items were filler items. The attitude item of interest read “Rate how you feel about the University making graduation for seniors contingent on the completion of comprehensive examinations in the students’ main area of study” (1=very undesirable, 9= very desirable). Using the same 9-point rating scale, participants rated the importance of comprehensive exams to them.

Phase II: Experimental Design

The design of the study is a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants factorial analysis of variance (ANOVA) design. Without knowing personality type (UOs and COs) or initial attitude position (counter- vs proattitudinal), participants were randomly assigned to levels of the other factors.

Phase II: Experimental Session

The methodology used for Study 1 was a conceptual hybrid of the methodologies employed by Mackie et al. (1990, Study 1) and Sorrentino et al. (1988, Study 2). The basic procedure was similar to that of Mackie and colleagues except where noted. Basically, there were two critical differences between that study and the present study. First, the issue in the Mackie et al. study concerned the use of SAT exams as a criterion for entrance to university. This was not possible for the present investigation, considering that Canadian students do not undergo a procedure similar to the use of the SAT exam. Instead, the present study dealt with the issue of implementing comprehensive exams for undergraduates, upon which their degree conferment would be

contingent. Where the SAT issue deals with attained membership (admittance to university), the comprehensive exam issue concerns future membership (as a degree recipient and an alumnus). The decision to deviate from Mackie et al. (1990) was based on the fact that Canadian students do not complete SAT exams, and that Sorrentino et al. (1988) had already tested the selected materials on a sample at this university. In either case, however, group categories should be both highly salient and meaningful to the participants. Second, delegates in the Mackie study disagreed with the use of SAT exams, whereas delegates in the present study agreed with the use of comprehensive exams.

Participants were tested individually for Phase II, which took place 3 to 6 weeks after Phase I. Following the materials used by Mackie et al. (1990, Study 1), the cover story for the study presented to participants read:

We are interested in people's perceptions of delegates who are representing their constituents at conferences. You will be reading a speech that was delivered by a delegate at an intercollegiate conference. The particular argument that you will be reading was presented by a student from [The University of Western Ontario/Ottawa]. The speech discusses whether undergraduate university students should be required to complete comprehensive exams in their area of concentration before receiving their degrees. This issue is currently a popular topic of debate among university administrators across Canada. In fact, the Ontario Ministry of Education is currently considering the institution of comprehensive exams for undergraduates. Please read the speech and then we will ask you some questions about the speech and the delegate.

Participants then read a speech on educational policy from a representative who had allegedly spoken at the intercollegiate conference (see Appendix A).

Source of Message Manipulation. Participants were informed verbally that the speech they were about to read was delivered by either a University of Western Ontario student (ingroup member) or University of Ottawa student (outgroup member). This

manipulation was also presented in written form in the instructions (see above), and participants were reminded of the message source by a heading reading “Summary of Arguments Presented by [The University of Western Ontario/Ottawa] Student Representative” located above the arguments.

Argument Quality Manipulation. The message source variable was crossed with an argument quality variable. After reading the representative’s position on the issue (i.e., that the delegate favoured the use of comprehensive exams), each participant read six arguments in support of the position. Participants were randomly assigned to read predominantly weak arguments (e.g., “By not administering the exams, the university would be continuing its violation of an academic tradition. Numerous people have complained that we have already lost too many traditions’), or predominantly strong arguments (e.g., “Prestigious universities have comprehensive exams in order to maintain academic excellence. Eight of the top ten schools in the United States use comprehensive exams. Only three universities below the top ten use comprehensive exams”). The weak and strong arguments were approximately the same length and same level of comprehension difficulty. The validity of these arguments has been tested and employed previously by samples at the University of Western Ontario (see Sorrentino et al., 1988).

Initial Attitude Position. Median splits on the initial attitude measure administered in Phase I (9-point rating scale) determined the extent to which, for each participant, the comprehensive exam message was counter- or pro-attitudinal. Participants were either classified as being counterattitudinal (score ≤ 5) or proattitudinal (score > 5), and this split was employed to analyze the data.

Principal Dependent Measures. After reading the weak or strong arguments from an ingroup or outgroup member, participants completed several dependent measures (all 9-point rating scales). First, participants responded to the question “Rate how you feel about the University making graduation for seniors dependent on the completion of comprehensive examinations in the students’ main area of study” (1=very undesirable, 9= very desirable), the same item completed in Phase I. Participants then rated the extent to which comprehensive exams are good-bad, wise-foolish, and beneficial-harmful, along three 9-point semantic differential scales. Based on Mackie et al. (1990, Study 1), participants were then asked to use 9-point rating scales to evaluate a variety of measures, including the persuasiveness and strength of the arguments, the trustworthiness and expertise of the delegate, and issue importance.

After completing these measures, participants were asked to list the thoughts that surfaced as they read the speech (see Mackie et al., 1990). After completing the thought-listing measure (see Appendix A), participants were informed that the study was finished. At this point, however, they were requested to remain seated to complete another, entirely unrelated study.

Summary of Experimental Procedure for Phase II (Study 1). Participants were informed that the researchers were interested in people’s perceptions of delegates who spoke at a conference on the issue of comprehensive exams. They were told that the Ministry of Education was at that moment considering the implementation of comprehensive exams. Participants then read weak or strong arguments from an ingroup or outgroup member. Upon completion, participants rated a variety of dimensions (e.g., favourability of comprehensive exams, the persuasiveness of arguments used, qualities of

the speaker), and completed a thought-listing measure. Finally, participants were thanked for their participation.

Treatment of the Data

The main hypotheses were tested using a priori one-tailed t-tests based on the within-cell error term of ANOVA, as suggested by Winer (1971). Four-way ANOVAs (Uncertainty Orientation X Source X Argument Quality X Position) were conducted to test for overall effects of the dependent measures.⁷

The coded means for the predicted three-way interaction (conducted for each personality type, i.e., for both UOs and COs) are found in Table 1-1. The contrasts performed were: $[(a - b) - (c - d)] - [(e - f) - (g - h)]$.

Notes on the Interpretation of Predicted Patterns of Interaction

The tested pattern of interaction is presented in Table 1-1, with the contrasts being $[(a - b) - (c - d)] - [(e - f) - (g - h)]$. In order to aid in the presentation of the results, a brief discussion will be given to the tests of this pattern. Three predicted patterns are tested, referred to as the Overall Pattern, the Ingroup Pattern, and the Outgroup Pattern. The Overall Pattern refers to the $[(a - b) - (c - d)] - [(e - f) - (g - h)]$ equation. This tests the prediction that strong arguments lead to more favourable evaluations than weak arguments when disagreeing with the ingroup than agreeing with it, and that this difference will be greater than for the comparable difference for the outgroup comparisons.

⁷ As expected, the resultant uncertainty orientation measure proved a better predictor of the principal findings than did either of its two components (nUncertainty, authoritarianism), and will be used to report the findings.

Table 1-1

Coded Means for 3-way Pattern of Interaction of Argument Source, Argument Quality
and Initial Attitude Position

	Position of Initial Attitude	
	Counter-Attitudinal	Pro-Attitudinal
Ingroup		
Weak Arguments	b	d
Strong Arguments	a	c
Outgroup		
Weak Arguments	f	h
Strong Arguments	e	g

As will soon become evident, the Overall Pattern is comprised of the Ingroup Pattern and the Outgroup Pattern. The Ingroup Pattern tests the first half of the Overall Pattern, the (a - b) - (c - d) portion. This predicts that for ingroup messages, the strong vs weak argument difference will be greater when initially disagreeing with the message than when agreeing with it. The Outgroup Pattern tests the second half of the Overall Pattern equation, the (e - f) - (g - h) portion. This tests the reverse of the Ingroup Pattern (due to the negative sign preceding this equation), which therefore predicts that the strong vs weak argument difference will be greater when agreeing with the outgroup than when disagreeing with it. These three terms shall be used in the Results section to simplify and help clarify the analyses. It is important to keep in mind that *the Overall Pattern for the UOs is predicted to be greater than that for the COs*, where a reversal likely is to be found (again, due to the negative sign), such that COs should show greatest strong vs weak differentiation when agreeing with the ingroup and disagreeing with the outgroup (i.e., conditions of certainty).

Results

Multivariate Analysis of Principal Measures

The five main dependent measures of interest (argument strength [manipulation check], post-exposure attitudes, message persuasiveness, delegate trustworthiness, and delegate expertise) were entered into a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants multivariate analysis of variance (MANOVA, see Table 1-2 for summary). Results revealed a significant multivariate effect for Argument Quality (Pillais=.322, $F(5,114)=12.37$, $p<.001$), a marginal interaction of Uncertainty Orientation X Source (Pillais=.087, $F(5,114)=2.17$, $p<.062$), and a 4-way interaction that approached significance (Pillais=.089, $F(5,114)=2.21$, $p<.058$).

Manipulation Check for Argument Quality

Participants had been asked to rate the strength of the arguments presented by the delegate (9-point rating scale, 1 = very weak to 9 = very strong). This measure was subjected to a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA. In support of the manipulation, a significant main effect reveals that those exposed to strong arguments ($M=6.97$, $SD=1.45$) rated the arguments as stronger than those exposed to weak arguments ($M=4.65$, $SD=2.31$), $F(1,118)=41.77$, $p<.001$.

Several other effects for this variable were found. A significant Uncertainty Orientation X Source interaction reveals that for COs outgroup messages ($M=5.50$,

Table 1-2

Multivariate Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.), Source, Quality, and Position on Principal Measures

Source of Variation	Pillais	F	p of F
<u>Main Effects</u>			
U.O.	.041	.99	.430
Source	.039	.92	.468
Quality	.352	12.37	.000
Position	.065	1.58	.171
<u>2-Way Interactions</u>			
Quality X Source	.048	1.51	.338
Quality X U.O.	.059	1.43	.218
Quality X Position	.020	.44	.803
Source X U.O.	.087	2.17	.062
Source X Position	.074	1.82	.115
U.O. X Position	.059	1.42	.221
<u>3-Way Interactions</u>			
Quality X Source X U.O.	.002	.05	.998
QualityXSourceXPosition	.061	1.48	.202
Quality X U.O. XPosition	.030	.70	.628
Source X U.O. X Position	.027	.63	.678
<u>4-Way Interaction</u>			
U.O. X Source X Quality X Position.	.089	2.21	.058

$SD=2.20$) were rated stronger than ingroup messages ($M=6.42$, $SD=2.21$), yet for UOs ingroup messages ($M=5.96$, $SD=2.32$) were rated as stronger than outgroup messages ($M=5.19$, $SD=2.25$), $F(1,118)=7.11$, $p<.009$. In addition, a Source X Position interaction reveals that for counterattitudinal messages, ingroup arguments ($M=6.04$, $SD=2.08$) were rated as stronger than were outgroup arguments ($M=5.25$, $SD=2.21$), yet for proattitudinal messages, outgroup arguments were rated as being stronger ($M=6.32$, $SD=2.29$) than ingroup messages ($M=5.51$, $SD=2.34$), $F(1,118)=4.48$, $p<.036$. No other effects or interactions were significant.

Post-Exposure Attitudes Toward Comprehensive Exams

Immediately after reading the delegate's arguments, participants reported their attitudes toward the topic of comprehensive exams (9-point rating scale, 1 = very undesirable to 9 = very desirable). The predicted patterns for UOs and COs will be dealt with first, and then will follow a test of the overall effects.

Uncertainty-Oriented Participants. Figure 1-1a illustrates that for UOs, strong arguments resulted in more favourable attitudes toward comprehensive exams than did weak arguments, but only under conditions of uncertainty or incongruence (i.e., disagreement with the ingroup, agreement with the outgroup). Under conditions of relative certainty (i.e., agreement with ingroup, disagreement with outgroup), UOs were simply more accepting of ingroup messages and less accepting of outgroup messages.

The a priori test of the Overall Pattern of interaction tested that the difference between strong and weak arguments would be greater when disagreeing with an ingroup member ($M = 6.33$, $SD=2.89$ vs $M=3.86$, $SD=2.04$) than when agreeing with them ($M=6.50$, $SD=1.20$ vs $M=6.10$, $SD=1.37$), and that this difference would be greater than

Uncertainty-Oriented (UO) Participants

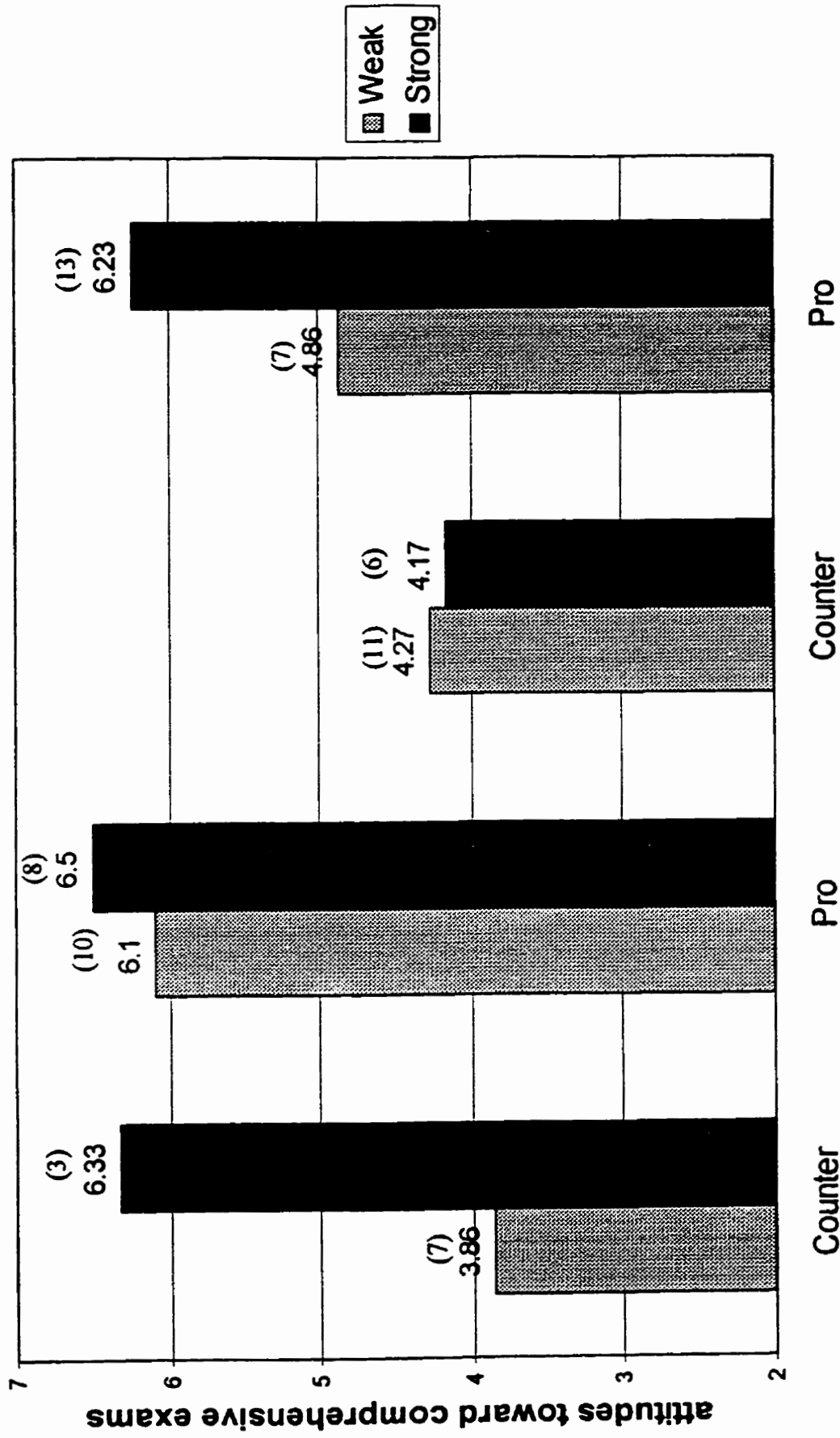


Figure 1-1a. Uncertainty-oriented participants' attitudes toward comprehensive exams as a function of Source and Quality of message, initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

the same difference for the outgroup message (agreement $\underline{M}= 6.23$, $\underline{SD}=1.92$ vs $\underline{M}=4.86$, $\underline{SD}=2.54$; disagreement $\underline{M}= 4.17$, $\underline{SD}=2.79$ vs $\underline{M}=4.27$, $\underline{SD}=2.61$). This pattern was only marginally significant, $t(118)=1.58$, $p<.10$. The Ingroup and Outgroup Patterns likewise were not significant, $t_s(118)=1.19$, 1.03 , respectively.

The only significant strong vs weak ($\underline{M}=6.33$, $\underline{SD}=2.89$ vs $\underline{M}=3.86$, $\underline{SD}=2.04$) comparison was found under the condition that offers perhaps the greatest degree of uncertainty, where UOs discovered that they disagreed with a representative from their ingroup $t(118)=1.73$, $p<.05$. The difference between strong and weak messages was not significant for any of the other three conditions, although it did approach significance for the other high uncertainty condition (i.e., agreeing with the outgroup, $\underline{M}=6.23$, $\underline{SD}=1.92$ vs $\underline{M}=4.86$, $\underline{SD}=2.54$), $t(118)=1.41$, $p<.10$.

Overall, the pattern illustrated in Figure 1-1a illustrates that UOs reported more favourable attitudes following strong than weak arguments only under an uncertain condition (ingroup disagreement), and marginally so when agreeing with the outgroup, (another uncertain condition). Under conditions of relative certainty (agreeing with the ingroup or disagreeing with the outgroup), UOs showed less evidence of differentiation between strong and weak arguments. In fact, under these conditions, UOs simply reported attitudes in line with their initial attitude positions, or, alternatively, consistent with ingroup's position and contrary to outgroup's position.

Certainty-Oriented Participants. Figure 1-1b illustrates the pattern of interaction for the CO participants. For the most part, strong arguments resulted in more favourable attitudes than did weak arguments, due to a significant main effect of Argument Quality to be discussed shortly. The only instance where this difference was significant (see

Certainty-Oriented (CO) Participants

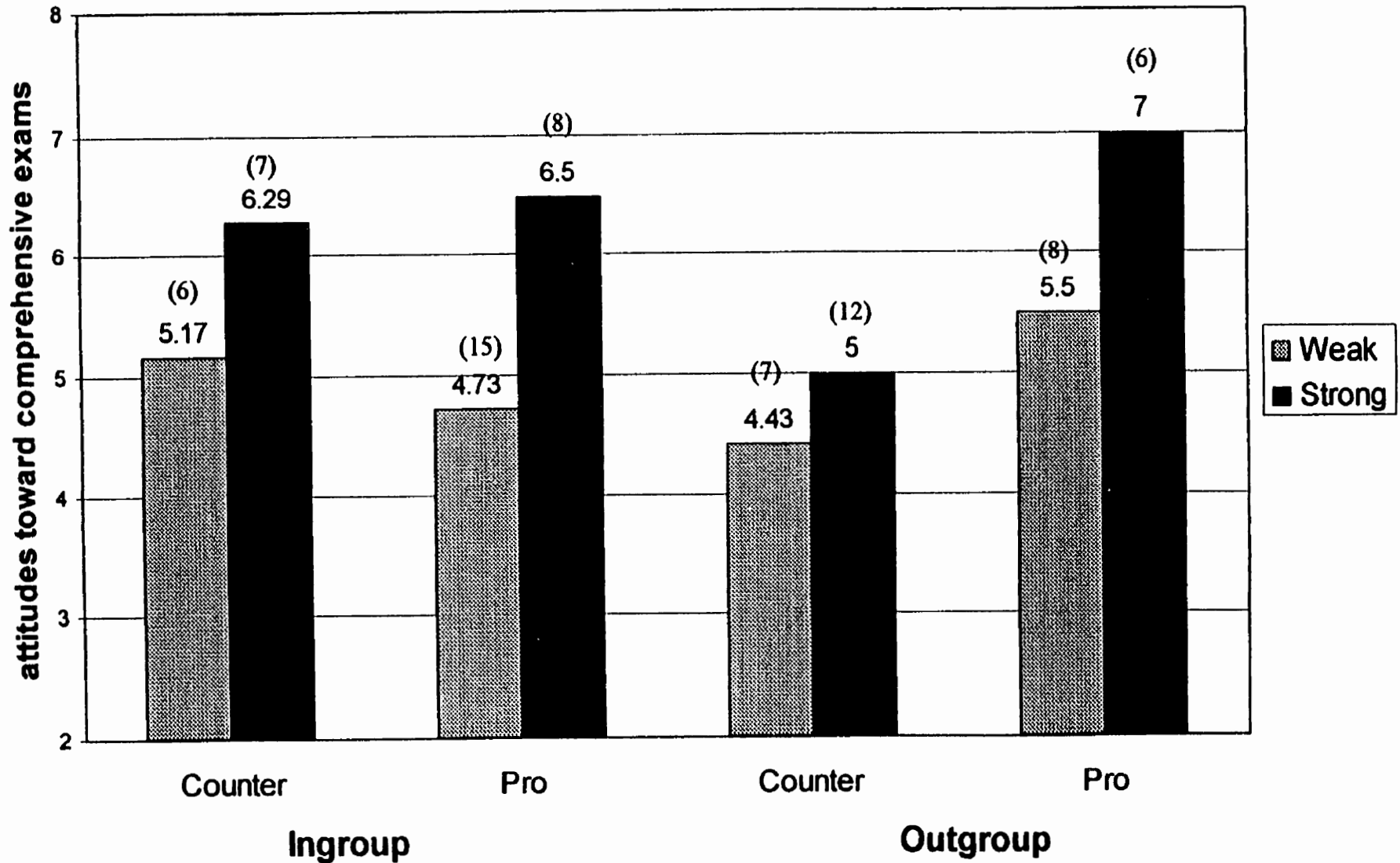


Figure 1-1b. Certainty-oriented participants' attitudes toward comprehensive exams as a function of Source and Quality of message, initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

below), however, was under the condition of perhaps the highest degree of certainty (agreement with the ingroup).

Again, it was expected that COs would have more favourable attitudes toward comprehensive exams following strong than weak arguments, and that this difference would be most pronounced under conditions of high certainty (i.e., agreeing with the ingroup or disagreeing with the outgroup member). The a priori tests failed to reach significance for the Overall Pattern, $t(118)=-.13$, Ingroup Pattern, $t(118)=.44$, or Outgroup Pattern, $t(118)=.62$, all ns.

Indeed, the only significant difference of reported attitudes between the strong and weak arguments conditions was found under the conditions of perhaps the greatest certainty, where COs found themselves agreeing with their ingroup ($M=6.50$, $SD=1.31$ vs $M=4.73$, $SD=2.55$), $t(118)=1.92$, $p<.05$. No other strong vs weak argument comparisons were significant. As will become evident in the following sections, the personality differences noted above become even more clearer when examining the other measures (such as ratings of message persuasiveness, and delegate trustworthiness and expertise).

The test that the Overall Pattern for the UOs would be greater than that for the COs was not found to be significant for this variable, $t(118)=1.06$, ns.

Overall Effects. The attitude measure was subjected to a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA. No differences in pre-exposure attitudes toward comprehensive exams (collected in Phase I) were found between experimental conditions or personality types (see Table 1-3, Appendix C). A significant main effect of Argument Quality reveals that

participants reported more favourable attitudes toward comprehensive exams after exposure to strong ($M=5.95$, $SD=1.90$) than weak ($M=4.87$, $SD=2.26$) arguments favouring the exams, $F(1,118) = 8.80$, $p<.004$. In addition, a Position main effect reveals that those who initially agreed with the argument position were more favourable toward the comprehensive exams ($M=5.83$, $SD=2.04$) after exposure to the message than those who initially disagreed with the position ($M=4.81$, $SD=2.19$), $F(1,118)=6.65$, $p<.011$. Although the predicted 4-way pattern of interaction was not statistically significant, $F(1,118) = 1.14$, ns, (see Table 1-4 for ANOVA summary), the predicted patterns of interaction were for the most part significant and consistent with predictions (see Figures 1-1a and 1-1b).

Message Persuasiveness

Participants also rated the extent to which the message was persuasive (9-point rating scale, 1= not at all persuasive, 9=very persuasive).

Uncertainty-Oriented Participants. As with the attitude measure, it was expected that UOs would rate arguments as more persuasive following strong than weak argument exposure, but that this difference would be greater under incongruent (uncertain) than congruent (certain) conditions. This pattern is found in Figure 1-2a. The a priori test of the Overall Pattern is significant, $t(118)=2.10$, $p<.025$, as is the test for the Outgroup Pattern, $t(118)=2.50$, $p<.01$. As expected for the Outgroup Pattern, strong arguments were more persuasive than weak arguments, particularly to the extent that they were presented under a condition of uncertainty (agreeing with outgroup). The Ingroup Pattern is not significant, $t(118)=.57$, ns. Thus for UOs, strong ingroup messages were rated more persuasive than weak ones, regardless of the initially held attitude of the recipient.

Table 1-4

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Attitudes Toward Comprehensive Exams

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	2.40	.56	.456
Source	1	7.36	1.72	.193
Quality	1	37.69	8.80	.004
Position	1	28.47	6.65	.011
<u>2-Way Interactions</u>				
Quality X Source	1	2.67	.62	.431
Quality X U.O.	1	.30	.07	.791
Quality X Position	1	.44	.10	.750
Source X U.O.	1	2.86	.67	.416
Source X Position	1	5.67	1.32	.252
U.O. X Position	1	2.21	.52	.474
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	.29	.07	.796
QualityXSourceXPosition	1	6.70	1.56	.214
Quality X U.O. XPosition	1	2.15	.50	.480
Source X U.O. X Position	1	4.24	.99	.322
<u>4-Way Interaction</u>				
U.O. X Source X Quality X Position.	1	4.88	1.14	.288

Uncertainty-Oriented (UO) Participants

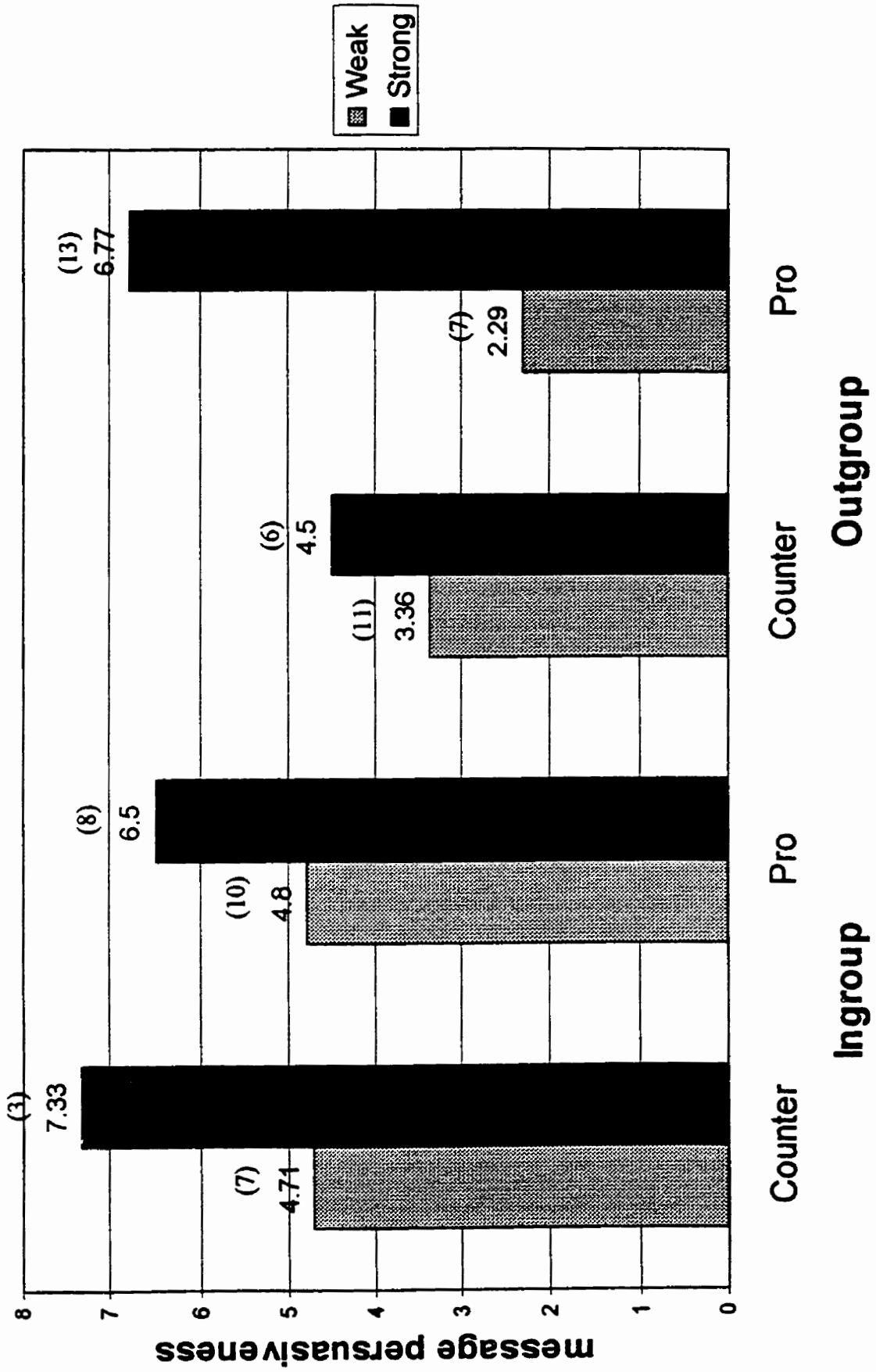


Figure 1-2a. Uncertainty-oriented participants' persuasiveness-ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

Looking at separate contrasts, UOs showed significant strong vs weak argument differentiation when disagreeing with the ingroup delegate ($\underline{M}=7.33$, $\underline{SD}=1.15$ vs $\underline{M}=4.71$, $\underline{SD}=1.89$), $t(118)=1.97$, $p<.05$, and when agreeing with the outgroup delegate ($\underline{M}=6.77$, $\underline{SD}=1.69$ vs $\underline{M}=2.29$, $\underline{SD}=1.38$), $t(118)=4.95$, $p<.001$, as expected. However, they also showed this pattern when agreeing with the ingroup ($\underline{M}=6.50$, $\underline{SD}=2.00$ vs $\underline{M}=4.80$, $\underline{SD}=2.30$), $t(118)=1.86$, $p<.05$. Under the other certain condition (disagreeing with the outgroup), strong arguments ($\underline{M}=4.50$, $\underline{SD}=2.26$) were not rated as more persuasive than weak arguments, ($\underline{M}=3.36$, $\underline{SD}=2.20$), $t(118)=1.16$, ns. In summary, UOs acted in accordance with predictions, showing strongest persuasion of strong than weak arguments under conditions of highest uncertainty (disagreeing with the ingroup, agreeing with the outgroup).

Certainty-Oriented Participants. The pattern for COs, shown in Figure 1-2b, is again consistent with predictions. That is, COs show increased ratings of message persuasiveness following exposure to strong than weak arguments under the more certain conditions compared to the uncertain conditions. The Overall Pattern of interaction for COs is significant, $t(118)=1.72$, $p<.05$, although the Ingroup and Outgroup Patterns are not, $t(118)=1.29$, $t(118)=1.14$, respectively.

Looking at specific contrasts, it can be seen that COs showed the most pronounced differentiation between strong and weak arguments under conditions where they agreed with an ingroup delegate ($\underline{M}=6.38$, $\underline{SD}=1.19$ vs $\underline{M}=3.87$, $\underline{SD}=2.07$), $t(118)=2.97$, $p<.005$, and disagreed with an outgroup delegate ($\underline{M}=6.92$, $\underline{SD}=1.24$ vs $\underline{M}=4.14$, $\underline{SD}=2.12$), $t(118)=3.03$, $p<.005$, both highly certain conditions. The strong vs weak argument comparisons were not significant under the more uncertain conditions.

Certainty-Oriented (CO) Participants

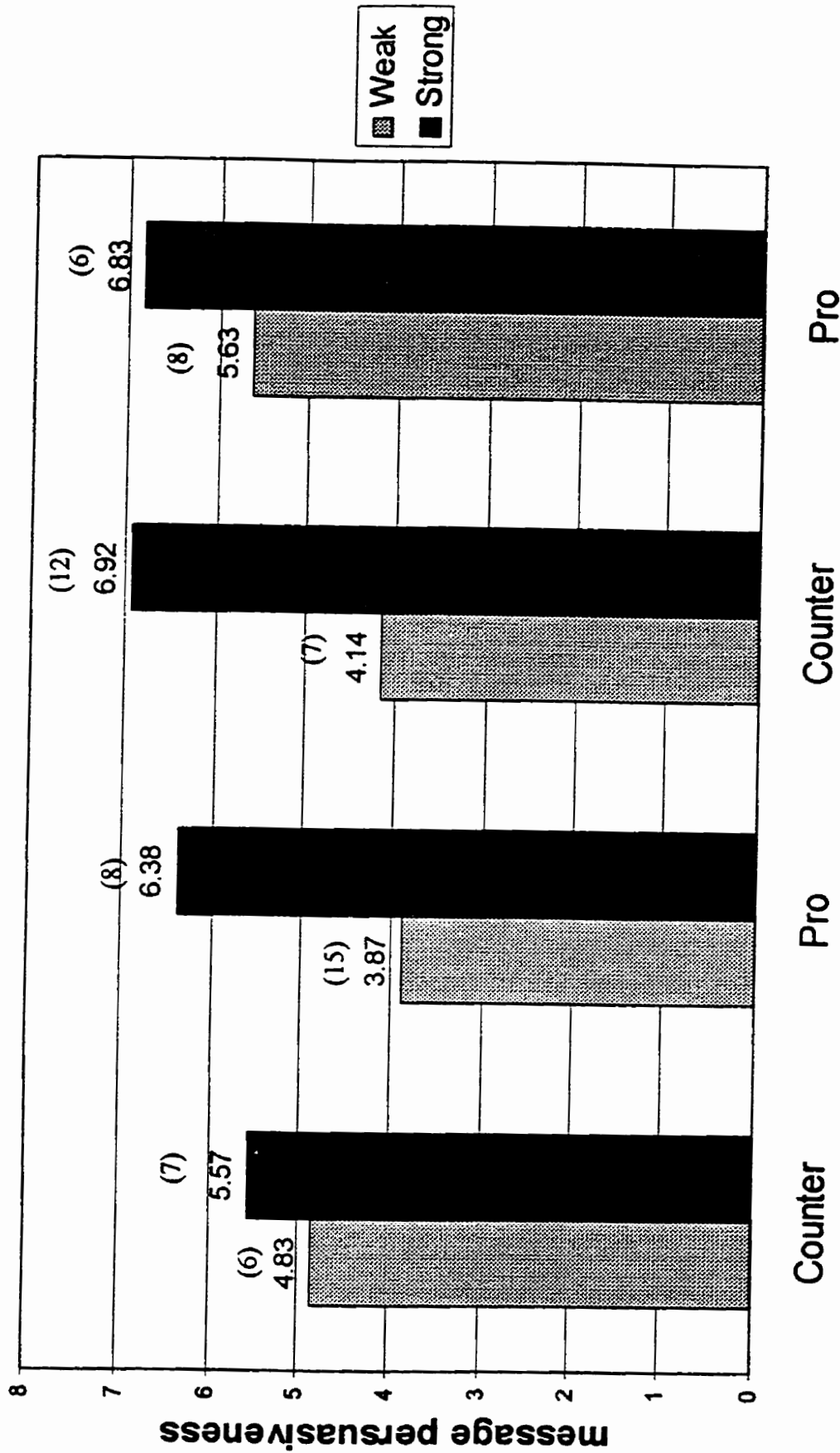


Figure 1-2b. Certainty-oriented participants' persuasiveness-ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

A significant a priori test reveals that the predicted Overall Pattern for UOs was significantly greater than the Overall Pattern for COs, $t(118) = 2.66, p < .005$.

Overall Effects. The message persuasiveness measure was subjected to a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA (see Table 1-5 for summary). As expected, a significant main effect for Argument Quality was found, whereby those exposed to strong arguments ($M=6.40, SD=1.73$) rated the message as more persuasive than did those exposed to weak arguments ($M=4.15, SD=2.23$), $F(1,118)=35.96, p < .001$. In addition, a significant Uncertainty Orientation X Source interaction was found, where COs rated ingroup messages ($M=4.92, SD=2.18$) to be less persuasive than outgroup messages ($M=6.00, SD=2.02$), yet UOs found ingroup messages ($M=5.54, SD=2.17$) to be more persuasive than outgroup messages ($M=4.54, SD=2.56$), $F(1,118)=10.55, p < .002$. These effects, however, were subsumed by a predicted, significant Uncertainty Orientation X Source X Argument Quality X Position interaction, $F(1,118)=7.05, p < .009$.

Trustworthiness of Delegate

Participants rated the extent to which the delegate was trustworthy (9-point rating scale), with higher scores reflecting higher trustworthiness. Although it was reasonable to expect a similar pattern with this variable as with the attitude and persuasiveness measures, argument scrutiny typically deals with evaluations of the message *per se*, as opposed to ratings of the speaker. Mackie et al. (1990, Expts 1 & 2) found no source by argument quality interaction effects for trustworthiness and expertise ratings of speakers. As a consequence, it was unclear whether effects would be found with these variables;

Table 1-5

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Message Persuasiveness

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	6.91	1.85	.176
Source	1	5.76	1.54	.216
Quality	1	134.11	35.96	.000
Position	1	1.28	.34	.559
<u>2-Way Interactions</u>				
Quality X Source	1	1.89	.51	.478
Quality X U.O.	1	3.34	.90	.346
Quality X Position	1	3.15	.85	.360
Source X U.O.	1	39.36	10.55	.002
Source X Position	1	5.58	1.50	.224
U.O. X Position	1	.28	.08	.783
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	.15	.04	.844
QualityXSourceXPosition	1	.39	.11	.746
Quality X U.O. XPosition	1	2.25	.60	.439
Source X U.O. X Position	1	.06	.02	.895
<u>4-Way Interaction</u>				
U.O. X Source X Quality X Position.	1	26.30	7.05	.009

they will not be tested by a priori tests of the interaction pattern but rather by ANOVA and two-tailed t-tests.

The delegate trustworthiness measure was thus analyzed in a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA (see Table 1-6 for summary). A significant main effect of Uncertainty Orientation reveals that COs ($M=5.61$, $SD=1.73$) rated the speaker as more trustworthy than did UOs ($M=5.11$, $SD=1.94$), $F(1,118)=4.27$, $p<.041$.

A significant Uncertainty Orientation X Source interaction was found, where COs rated the ingroup delegate ($M=5.33$, $SD=1.87$) as more trustworthy than the outgroup delegate ($M=5.91$, $SD=1.53$), while UOs rated the ingroup delegate to be more trustworthy ($M=5.64$, $SD=1.45$) than the outgroup delegate ($M=4.70$, $SD=2.17$), $F(1,118)=6.98$, $p<.009$. A significant Source X Position interaction revealed that when exposed to ingroup messages, delegates were rated as more trustworthy by those who countered the position ($M=5.74$, $SD=1.45$) than shared it ($M=5.32$, $SD=1.81$), while for outgroup messages, a pro-attitudinal speaker was rated more trustworthy ($M=5.85$, $SD=1.84$) than a counterattitudinal speaker ($M=4.72$, $SD=1.97$), $F(1,118)=7.51$, $p<.007$. However, these lower-order interactions were subsumed by a significant Uncertainty Orientation X Source X Argument Quality X Position interaction whose pattern conformed to predictions with principal hypotheses, $F(1,118)=4.65$, $p<.033$.

Uncertainty-Oriented Participants. The pattern shown in Figure 1-3a mirrors those for the attitude and persuasion measures for UOs. That is, these participants showed a tendency to rate delegates as more trustworthy after delivery of strong than

Table 1-6

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),Source, Quality, and Position on Trustworthiness of Delegate

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	12.48	4.27	.041
Source	1	6.37	2.18	.143
Quality	1	7.21	2.47	.119
Position	1	7.78	2.66	.165
<u>2-Way Interactions</u>				
Quality X Source	1	3.89	1.33	.251
Quality X U.O.	1	4.84	1.66	.201
Quality X Position	1	.34	.12	.733
Source X U.O.	1	20.42	6.98	.009
Source X Position	1	21.95	7.51	.007
U.O. X Position	1	3.17	1.09	.300
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	.00	.03	.869
QualityXSourceXPosition	1	4.39	1.50	.223
Quality X U.O. XPosition	1	2.29	.78	.378
Source X U.O. X Position	1	.00	.00	.989
<u>4-Way Interaction</u>				
U.O. X Source X Quality X Position.	1	13.60	4.65	.033

Uncertainty-Oriented (UO) Participants

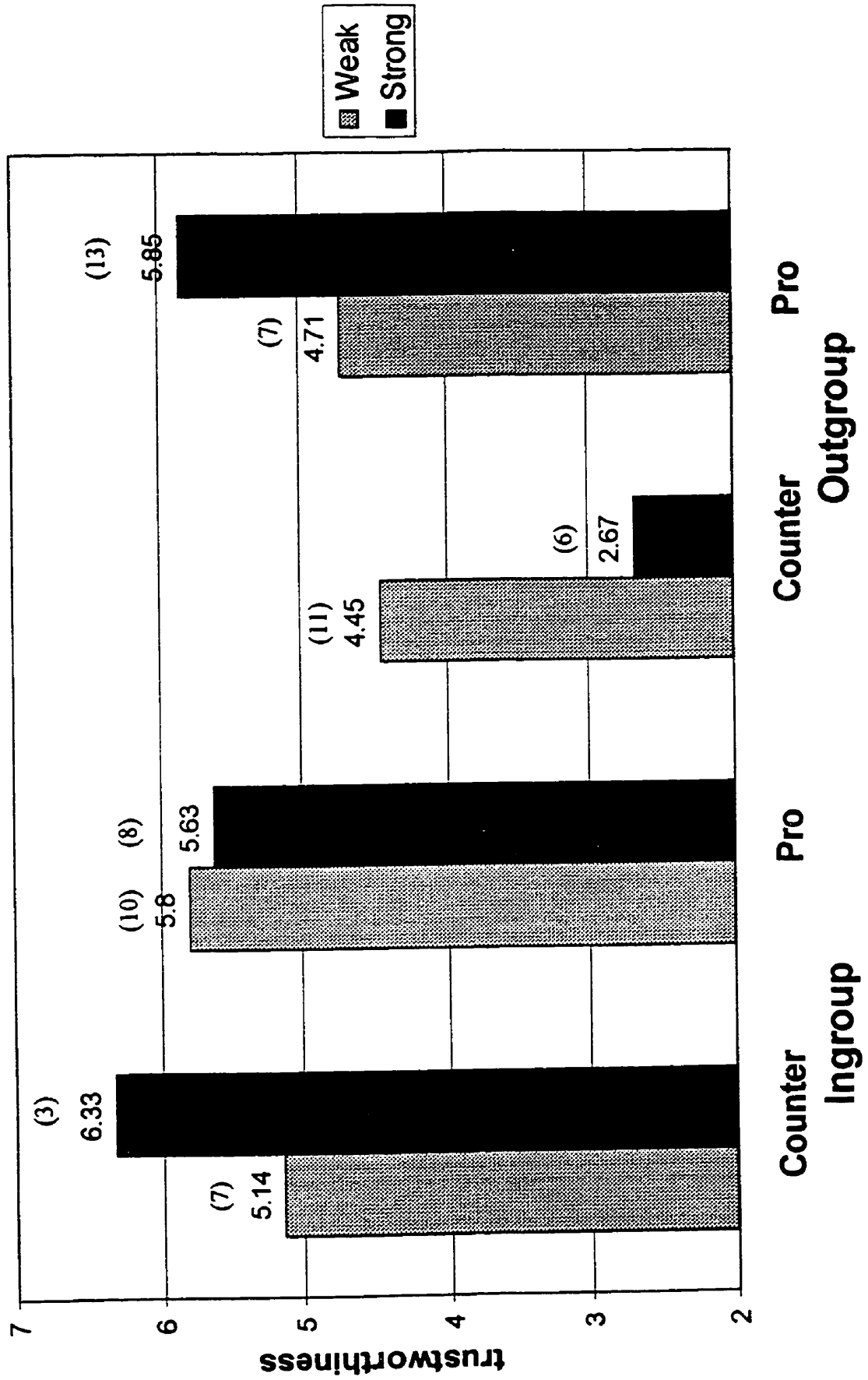


Figure 1-3a. Uncertainty-oriented participants' trustworthiness ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

weak arguments, but only under the conditions of relatively high uncertainty. Although these contrasts are not significant when disagreeing with the ingroup ($M=6.33$, $SD=.58$ vs $M=5.14$, $SD=1.21$), $t(118)=1.01$, ns, or when agreeing with the outgroup ($M=5.85$, $SD=1.82$ vs $M=4.71$, $SD=2.36$), $t(118)=1.42$, ns, these are the only conditions where strong arguments resulted in more favourable evaluations than did weak arguments. The only of the four cells showing significant differences between strong and weak argument conditions was found for the UOs receiving counterattitudinal message from the outgroup (i.e., a congruent/certain condition), but the mean was in the direction opposite to prediction, such that delegates delivering weak arguments were rated more favourably ($M=4.45$, $SD=2.16$) under these conditions than were those delivering strong messages ($M=2.67$, $SD=1.21$), $t(118)=2.05$, $p<.05$.

Certainty-Oriented Participants. The pattern for COs is shown in Figure 1-3b. This pattern appears to be consistent with the attitude and persuasion measures, with COs reporting what looks like higher trustworthiness ratings under certain conditions. However, two-tailed tests reveal that none of the strong vs weak contrasts were significant, $.13 < ts(118) < 1.80$. A marginally significant contrast was found in a congruent condition, where COs rated proattitudinal ingroup delegates as somewhat more trustworthy when they delivered strong ($M=5.88$, $SD=1.89$) than weak ($M=4.53$, $SD=1.85$) arguments, $t(118)=1.80$, $p<.10$.

In summary, a significant 4-way interaction for rated trustworthiness of delegates reveals a pattern that is consistent with the findings for the other attitude and persuasion ratings, where UOs show more pronounced differentiation between strong and weak arguments under conditions of uncertainty, and COs show more differentiation under

Certainty-Oriented (CO) Participants

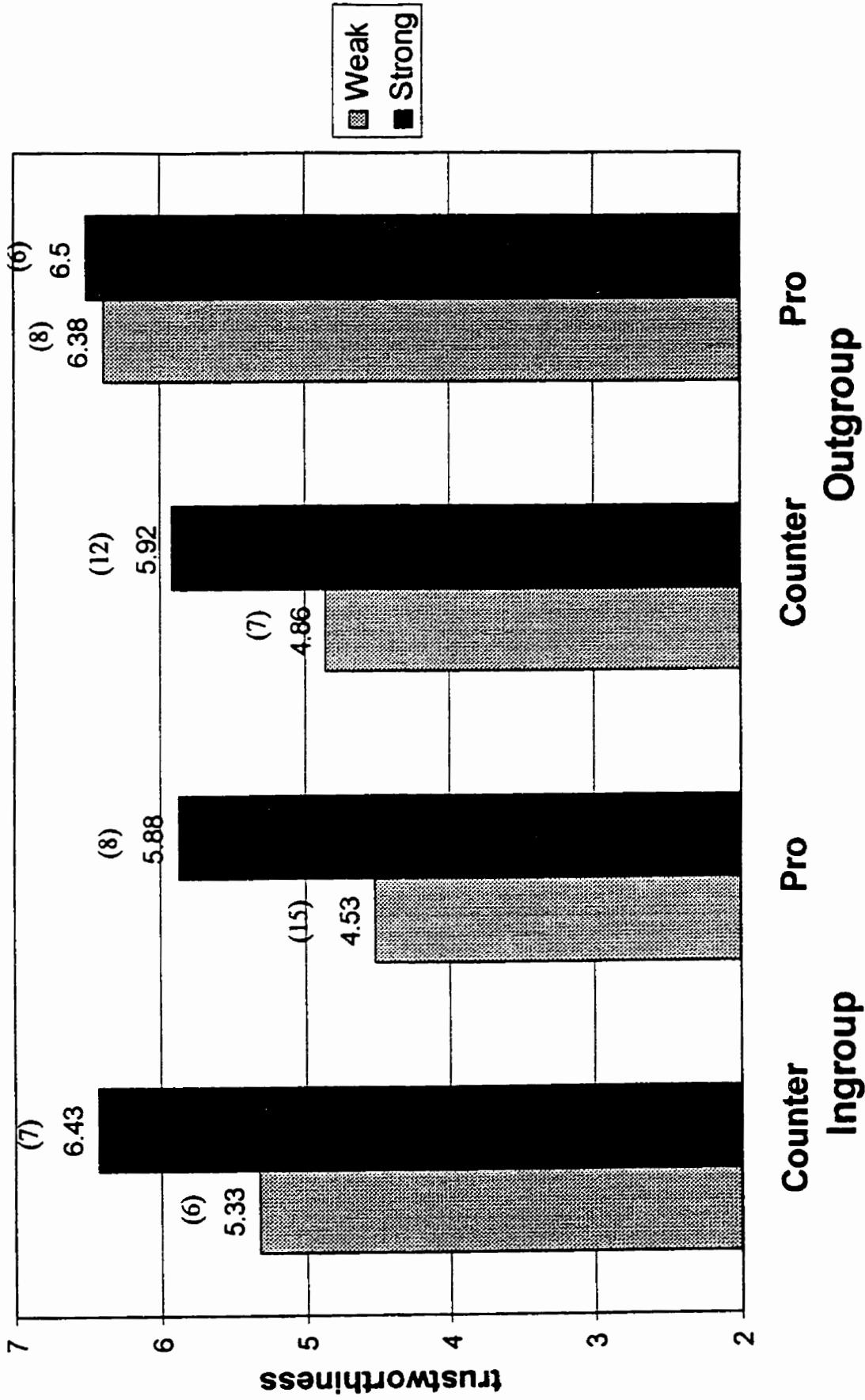


Figure 1-3b. Certainty-oriented participants' trustworthiness ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

conditions of certainty. Although many of the separate contrasts were not significant, the overall pattern is significant, and the pattern of interaction is of interest here.

Expertise of Delegate

Ratings of the delegate's expertise (9-point rating scale) were analyzed in a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA (see Table 1-7 for summary). A significant main effect of Argument Quality echoed that for post-exposure attitudes, whereby participants regarded the delegate delivering strong arguments ($M=6.06$, $SD=1.73$) to be higher in expertise than those delivering weak arguments ($M=4.21$, $SD=2.14$), $F(1,118)=25.29$, $p<.001$. A marginal main effect of Uncertainty Orientation shows that COs ($M=5.42$, $SD=2.02$) tended to rate the delegate as higher in expertise than did UOs ($M=4.72$, $SD=2.25$), $F(1,118)=3.59$, $p<.061$.

A significant Uncertainty Orientation X Source interaction reveals that while COs rated outgroup delegates ($M=4.92$, $SD=2.17$) as higher in expertise than ingroup delegates ($M=5.97$, $SD=1.72$), UOs rated ingroup delegates ($M=5.00$, $SD=2.13$) as higher in expertise than outgroup delegates ($M=4.50$, $SD=2.35$), $F(1,118)=6.70$, $p<.011$. Source also interacted with Position in a similar manner as with trustworthiness, so that ingroup delegates delivering counterattitudinal messages ($M=5.17$, $SD=2.12$) were deemed more expert than those delivering proattitudinal messages ($M=4.83$, $SD=2.16$), and outgroup delegates were seen as being more expert when delivering a pro- ($M=5.69$, $SD=2.10$) than counterattitudinal ($M=4.72$, $SD=2.20$) messages, $F(1,118)=3.80$, $p<.054$. Although the 4-way interaction based on the ANOVA was not statistically significant,

Table 1-7

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Expertise of Delegate

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	13.42	3.59	.061
Source	1	.25	.07	.795
Quality	1	94.64	25.29	.000
Position	1	3.16	.84	.360
<u>2-Way Interactions</u>				
Quality X Source	1	.44	.12	.732
Quality X U.O.	1	.48	.13	.720
Quality X Position	1	.00	.00	.963
Source X U.O.	1	25.08	6.70	.011
Source X Position	1	14.21	3.80	.054
U.O. X Position	1	.93	.25	.619
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	.00	.00	.987
QualityXSourceXPosition	1	.56	.15	.700
Quality X U.O. XPosition	1	.28	.08	.783
Source X U.O. X Position	1	1.07	.29	.595
<u>4-Way Interaction</u>				
U.O. X Source X Quality X Position.	1	6.93	1.85	.176

$F(1,118)=1.85, p<.176$, the pattern based on specific planned contrasts is consistent with the attitude, persuasiveness, and trustworthiness findings (see below).

Uncertainty-Oriented Participants. The pattern shown in Figure 1-4a reveals that expertise ratings were higher following the presentation of strong than weak arguments under the conditions of highest uncertainty. That is, when agreeing with the outgroup, these participants rated the strong-argument delegates as more expert ($M=6.12, SD=1.83$) than weak-argument delegates ($M=3.57, SD=2.23$), $t(118)=2.81, p<.01$, and a similar difference approached significance when disagreeing with the ingroup ($M=7.00, SD=1.00$ vs $M=4.43, SD=2.07$), $t(118)=1.93, p<.10$. Similar contrasts under conditions of certainty were not significant; agreement with ingroup ($M=5.75, SD=1.91$ vs $M=4.20, SD=2.20$), $t(118)=1.69, ns$, disagreement with outgroup ($M=4.33, SD=2.50$ vs $M=3.27, SD=2.00$), $t(118)=1.08, ns$.

Certainty-Oriented Participants. The expertise-rating pattern for COs is shown in Figure 1-4b. This pattern is also in keeping with the data presented thus far. The only significant strong vs weak contrasts are found for COs agreeing with an ingroup message ($M=6.13, SD=1.55$ vs $M=4.07, SD=2.19$), $t(118)=2.43, p<.02$, or disagreeing with an outgroup message ($M=6.42, SD=1.08$ vs $M=4.43, SD=2.07$), $t(118)=2.16, p<.05$. This is expected, as these conditions characterize a high degree of certainty. The similar contrasts under conditions of uncertainty are not significant (disagreement with ingroup, $M=5.86, SD=1.77$ vs $M=4.33, SD=2.50$, $t(118)=1.42$; agreement with outgroup, $M=7.00, SD=1.41$ vs $M=5.88, SD=1.73$, $t(118)=1.07$, both ns). Again the pattern shows higher expertise ratings following strong than weak arguments, particularly for COs under relatively certain conditions.

Uncertainty-Oriented (UO) Participants

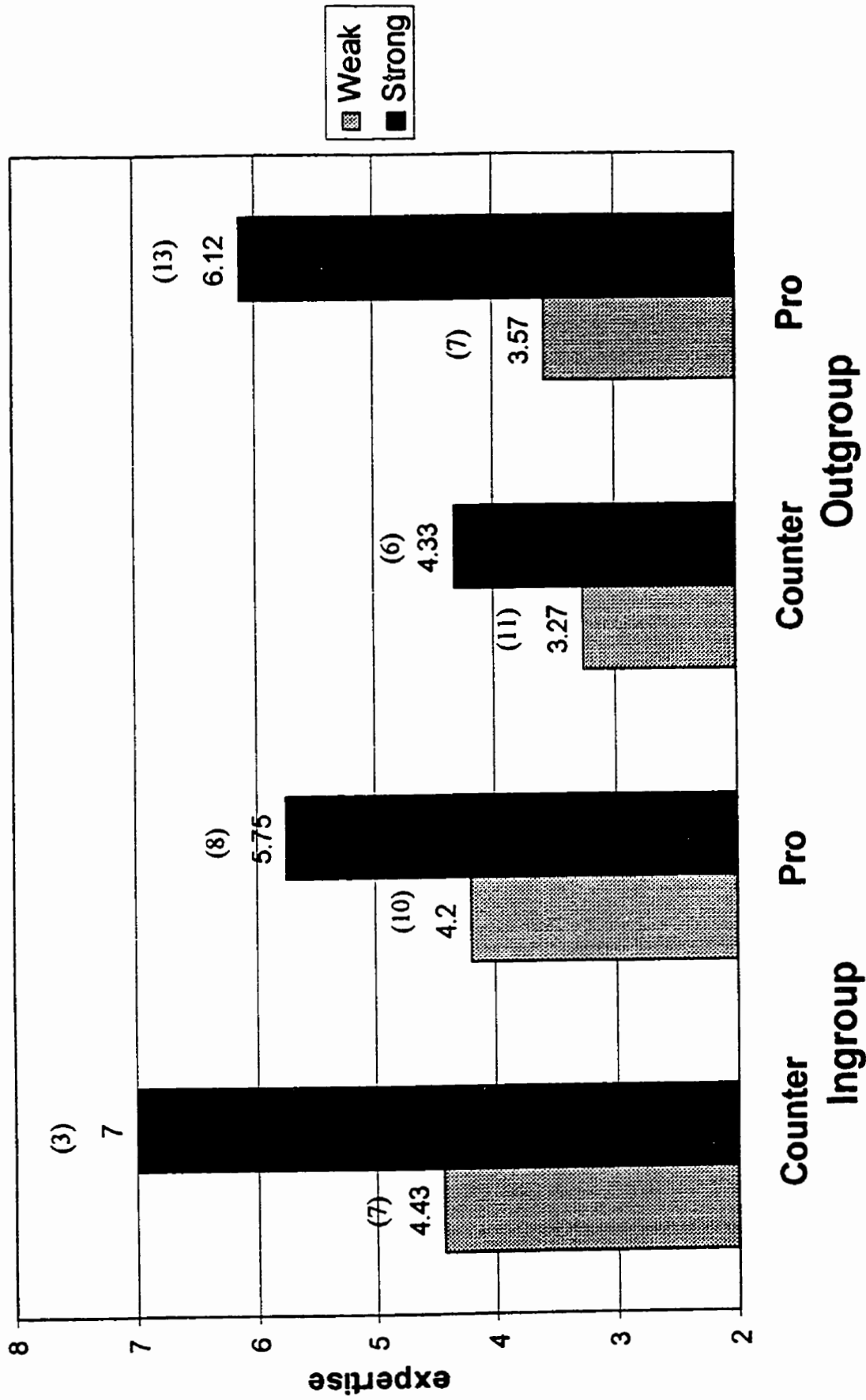


Figure 1-4a. Uncertainty-oriented participants' expertise ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

Certainty-Oriented (CO) Participants

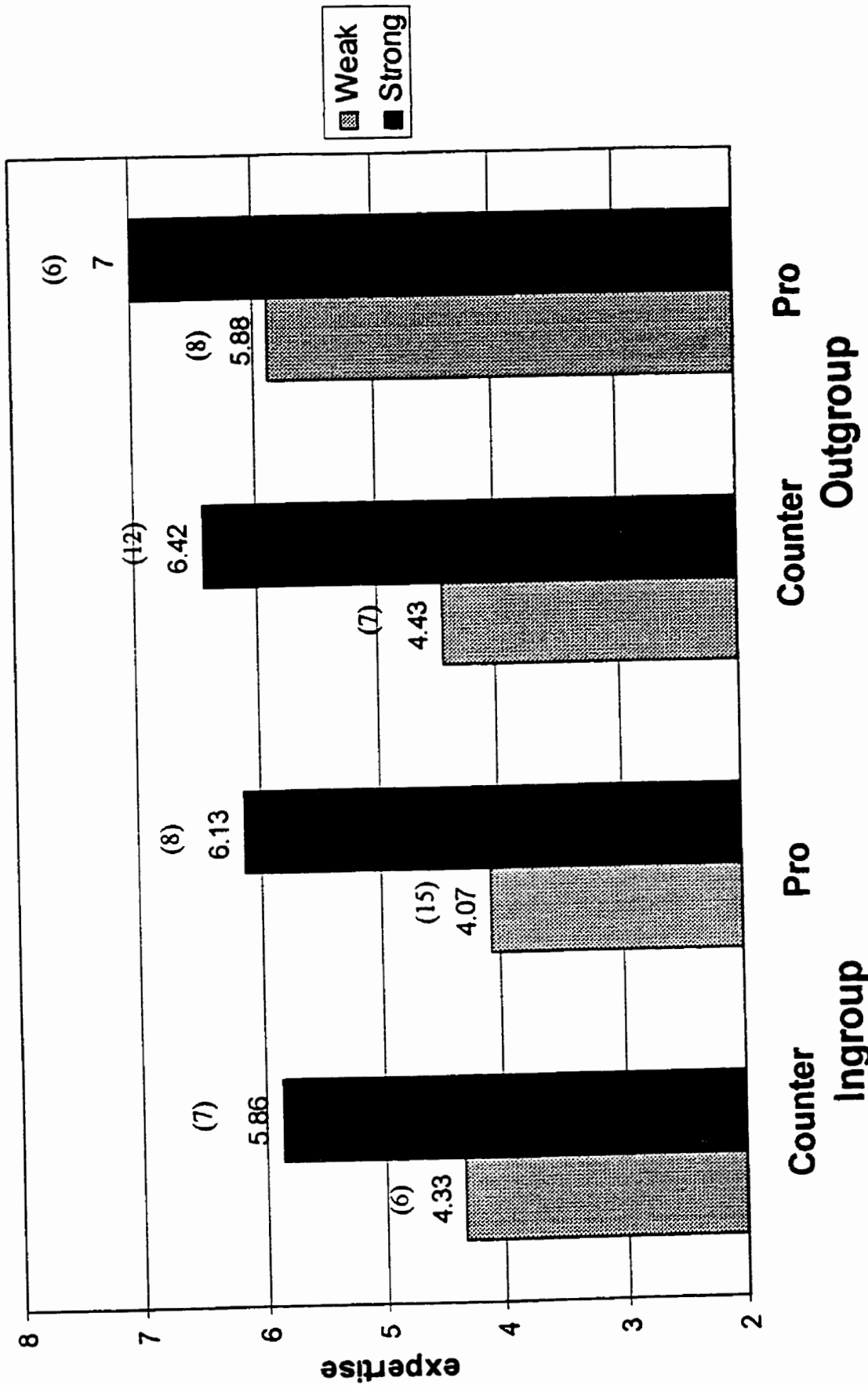


Figure 1-4b. Certainty-oriented participants' expertise ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

Change in Issue Importance

Using a 9-point rating scale, participants indicated the importance of the comprehensive exam issue in both Phase I and II. No differences in pre-exposure importance of the comprehensive exam issue were found between experimental conditions or personality types (see Table 1-8, Appendix C), with the exception that counterattitudinal participants ($M=4.46$, $SD=2.15$) initially viewed the issue as less important than those who were proattitudinal ($M=6.19$, $SD=1.68$), $F(1,118)=19.18$, $p<.001$. In order to examine the impact of the persuasion situation on importance ratings, a change score for issue importance was computed by subtracting importance during Phase I from importance during Phase II. This measure was analyzed by a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA (see Table 1-9 for summary).

A significant Position main effect revealed that counter-attitudinal participants demonstrated higher importance-rating change ($M=2.24$, $SD=2.81$) than did pro-attitudinal participants ($M=.61$, $SD=2.34$), $F(1,118)=9.43$, $p<.003$, though this is likely due to ceiling effects. This lower-order effect was subsumed by a marginally significant Uncertainty Orientation X Source X Argument Quality X Position interaction, $F(1,118)=3.31$, $p<.072$.

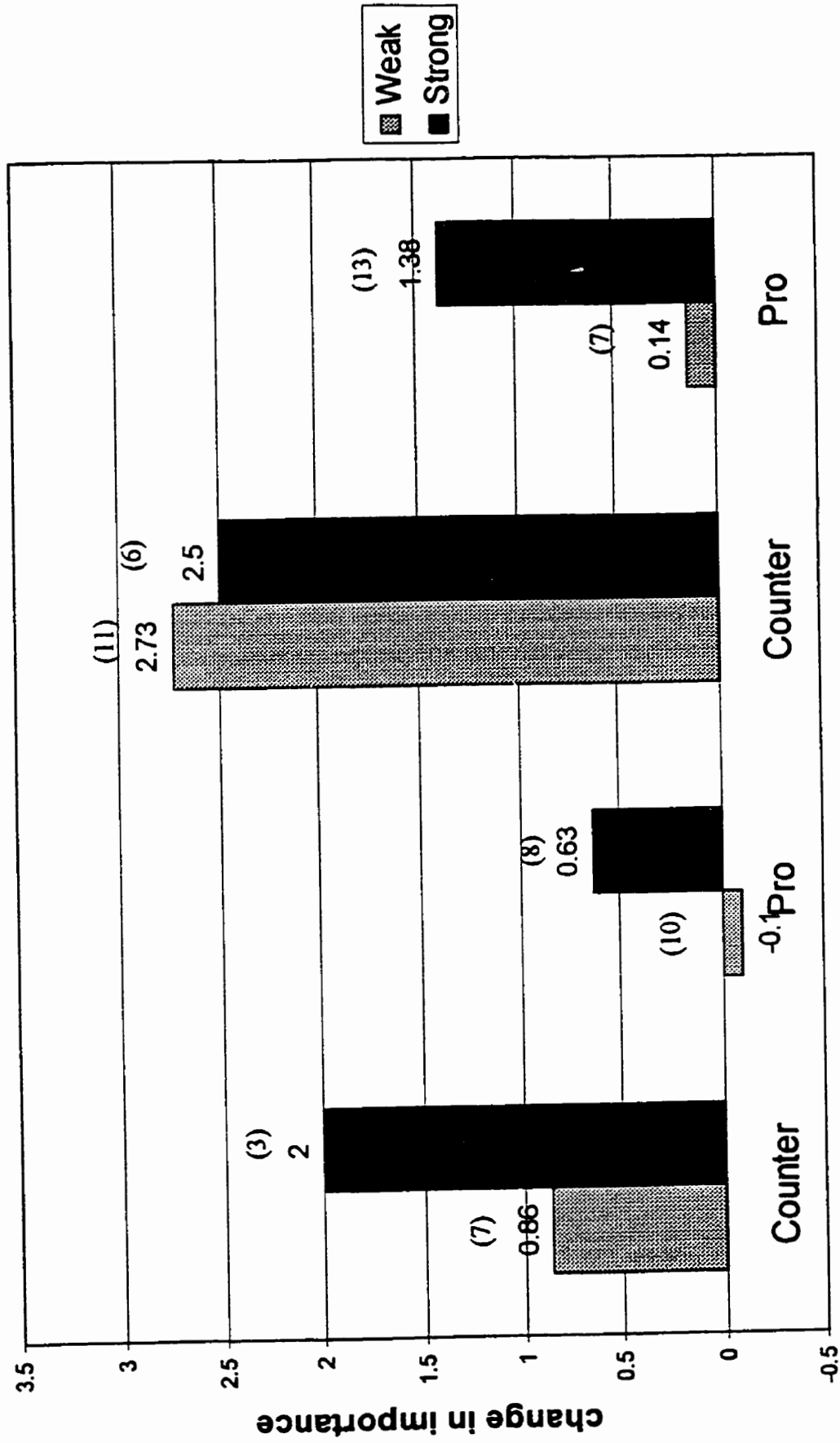
Uncertainty-Oriented Participants. The pattern for UO change in issue importance ratings is shown in Figure 1-5a. As differences on this variable were not predicted a priori, t-test patterns of the interaction are not appropriate, and significance

Table 1-9

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Change in Issue Importance

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	1.70	.26	.611
Source	1	14.27	2.18	.143
Quality	1	4.92	.75	.388
Position	1	61.78	9.43	.003
<u>2-Way Interactions</u>				
Quality X Source	1	2.03	.31	.579
Quality X U.O.	1	2.79	.43	.515
Quality X Position	1	.00	.00	.971
Source X U.O.	1	.60	.09	.763
Source X Position	1	2.05	.31	.577
U.O. X Position	1	.08	.01	.914
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	6.63	1.01	.317
QualityXSourceXPosition	1	4.45	.68	.412
Quality X U.O. Xposition	1	2.28	.35	.556
Source X U.O. X Position	1	10.73	1.64	.203
<u>4-Way Interaction</u>				
U.O. X Source X Quality X Position.	1	21.66	3.31	.072

Uncertainty-Oriented (UO) Participants



Ingroup

Outgroup

Figure 1-5a. Uncertainty-oriented participants' change in exam importance ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

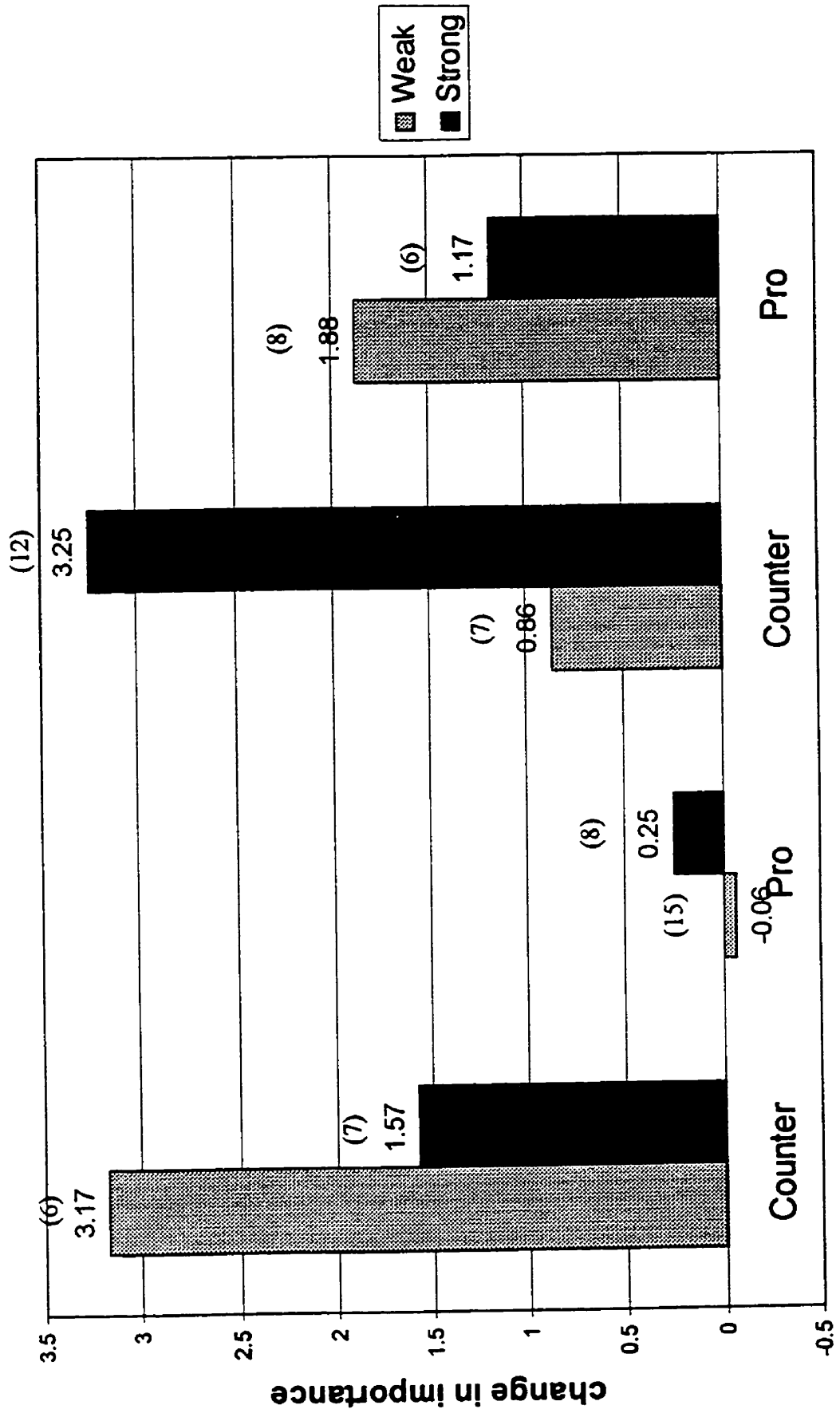
tests are two-tailed. As is clear from the Figure, the pattern of interaction is consistent with the findings reported thus far. The conditions under which UOs showed strongest change in importance ratings following strong than weak argument exposure was under the more uncertain conditions (i.e., disagreement with ingroup, $\underline{M}=2.00$, $\underline{SD}=1.00$ vs $\underline{M}=.86$, $\underline{SD}=3.67$; agreement with outgroup, $\underline{M}=1.38$, $\underline{SD}=1.98$ vs $\underline{M}=.14$, $\underline{SD}=3.39$) as opposed to the more certain conditions (i.e., agreement with ingroup, $\underline{M}=.63$, $\underline{SD}=1.85$ vs $\underline{M}=-.01$, $\underline{SD}=1.73$; disagreement with outgroup, $\underline{M}=2.50$, $\underline{SD}=3.27$ vs $\underline{M}=2.73$, $\underline{SD}=2.41$). None of the contrasts were statistically significant, however, $t_s(118)$ ranging from .18 to 1.03. Nonetheless, the marginally significant 4-way interaction supports the emerging patterns reported with other variables, especially when considering the pattern shown by the COs.

Certainty-Oriented Participants. COs show a much different pattern of responding (see Figure 1-5b) than do UOs. For COs, the only condition where strong arguments led to higher change in importance ratings than weak arguments was when they found that they disagreed with the outgroup (a certain condition), ($\underline{M}=3.25$, $\underline{SD}=3.05$ vs $\underline{M}=0.86$, $\underline{SD}=2.27$), $t(118)=1.96$, $p<.06$. Interestingly, COs also showed an increase in issue importance with exposure to counter-ingroup messages that were weak ($\underline{M}=3.17$, $\underline{SD}=1.94$) but not strong ($\underline{M}=1.57$, $\underline{SD}=3.26$), though this effect was not significant, $t=1.24$, ns.

Other Measures

Several other measures were collected, yet these did not reveal significant findings. First, the extra ratings of the comprehensive exams (good/bad, wise/foolish, beneficial/harmful), although highly correlated with one another ($\alpha = .89$) were only

Certainty-Oriented (CO) Participants



Ingroup Outgroup

Figure 1-5b. Certainty-oriented participants' change in exam importance ratings as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

modestly correlated with direct desirability ratings of the comprehensive exams (mean $r=.63$). Hence, these three items were aggregated and treated as a separate variable. No reliable findings were evident (see Table 1-10, Appendix C, for ANOVA summary). In addition, few findings were noted concerning the extent to which participants felt sure of their position on the issue when this variable was subjected to a similar 4-way ANOVA (see Table 1-11, Appendix C, for ANOVA summary). No predictions were made for this variable.

Cognitive Responses

The cognitive response analyses relied on the thought-listing measures provided by the participants. Two masked raters coded the materials ($r=.92$). Thoughts were coded as being favourable/unfavourable/neutral with regards to: message/content-related responses, source-related responses, and self-relevant responses (see Table 1-12, for Appendix C, for examples of coding). In addition, Accurate Reference to arguments was coded. Mackie et al. (1990) referred to this variable as “accurate recall,” but this does not seem an appropriate label, given that this variable simply measures the extent to which a specific argument used in the delegate’s speech was cited, and participants were not directly asked to recall arguments.

Accurate Argument Reference. Each time a particular fact or argument was mentioned by a participant in the thought-listing measure, it was recorded by the coders. This measure was analyzed by a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA (see Table 1-13, Appendix C for summary). Results indicated a marginal Argument Quality main effect,

$F(1,118)=3.02, p<.085$, a marginal Argument Quality X Position interaction, $F(1,118)=3.20, p<.076$, a marginal Uncertainty Orientation X Source X Position interaction, $F(1,118)=3.48, p<.065$, and a significant higher-order 4-way interaction, $F(1,118)=7.76, p<.006$. This 4-way interaction pattern is shown across Figures 1-6a and 1-6b. As shown in the figures, the interaction is driven primarily by two key differences between UOs and COs. Both personality types showed highest levels of argument reference when weak proattitudinal arguments were delivered, but for UOs this happened for an outgroup source ($M=2.57$), and for COs for an ingroup source ($M=2.20$). For both personality types, this high level of argument reference occurs under a condition matched with their personality (i.e., for UOs under an uncertain condition, and for COs under a certain condition).

Total Number of Thoughts. A sum of the total number of thoughts listed by participants was entered into a 2 (Uncertainty Orientation: CO vs UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA (see Table 1-14, Appendix C for summary). A marginal main effect of Uncertainty Orientation reveals that UOs ($M=8.11, SD=2.72$) tended to list more thoughts than did COs ($M=7.38, SD=2.25$), $F(1,118)=3.37, p<.069$. A marginal 4-way interaction was also found, $F(1,118)=3.20, p<.076$. No other effects approached significance.

Content-Related Thoughts. A favourability index was created by subtracting the number of negative content-related thoughts (i.e., those related to comprehensive exams) from the number of positive content-related thoughts. High scores reflect more positivity toward the exams. This variable was analyzed by a 2 (Uncertainty Orientation: CO vs

Uncertainty-Oriented (UO) Participants

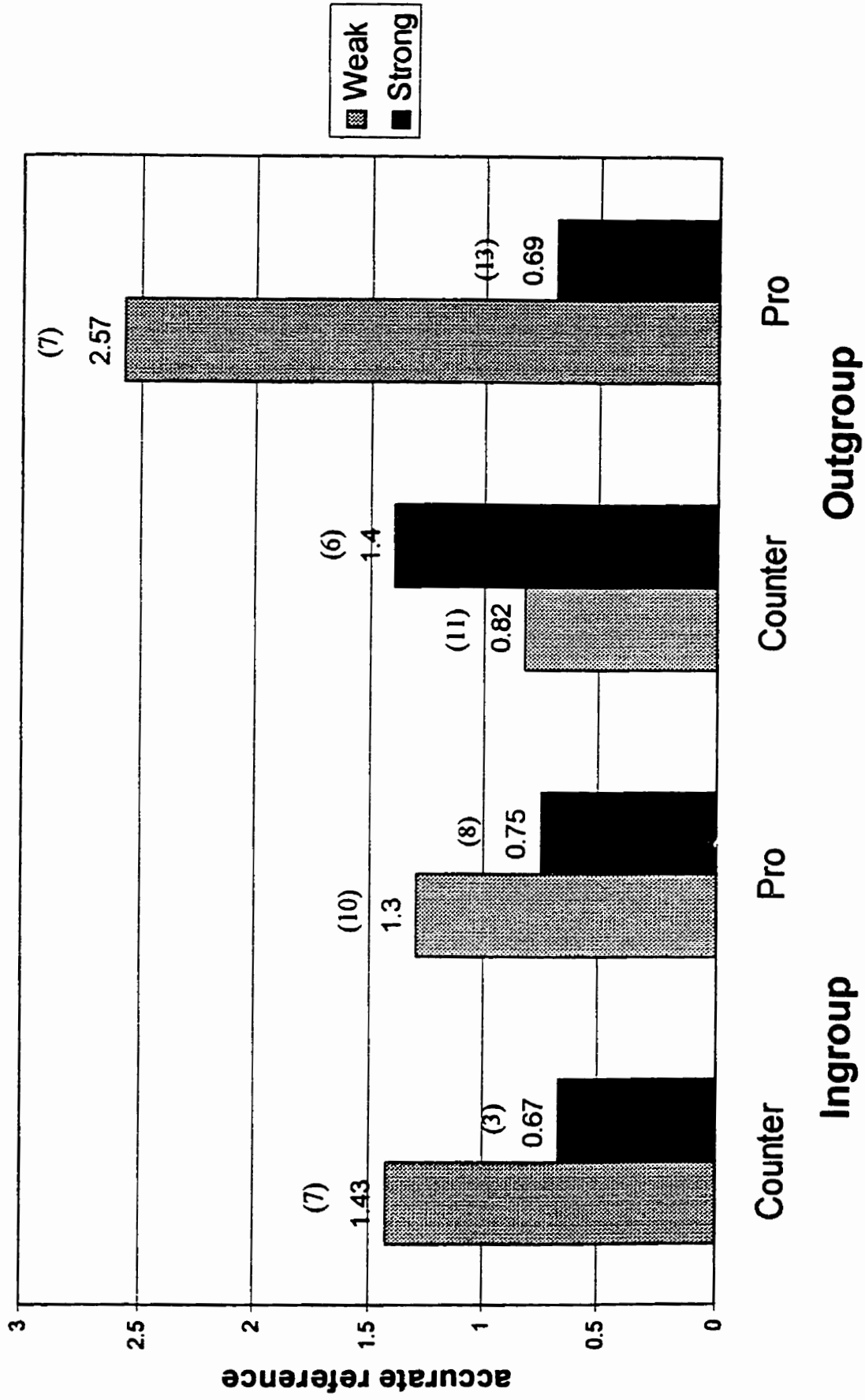
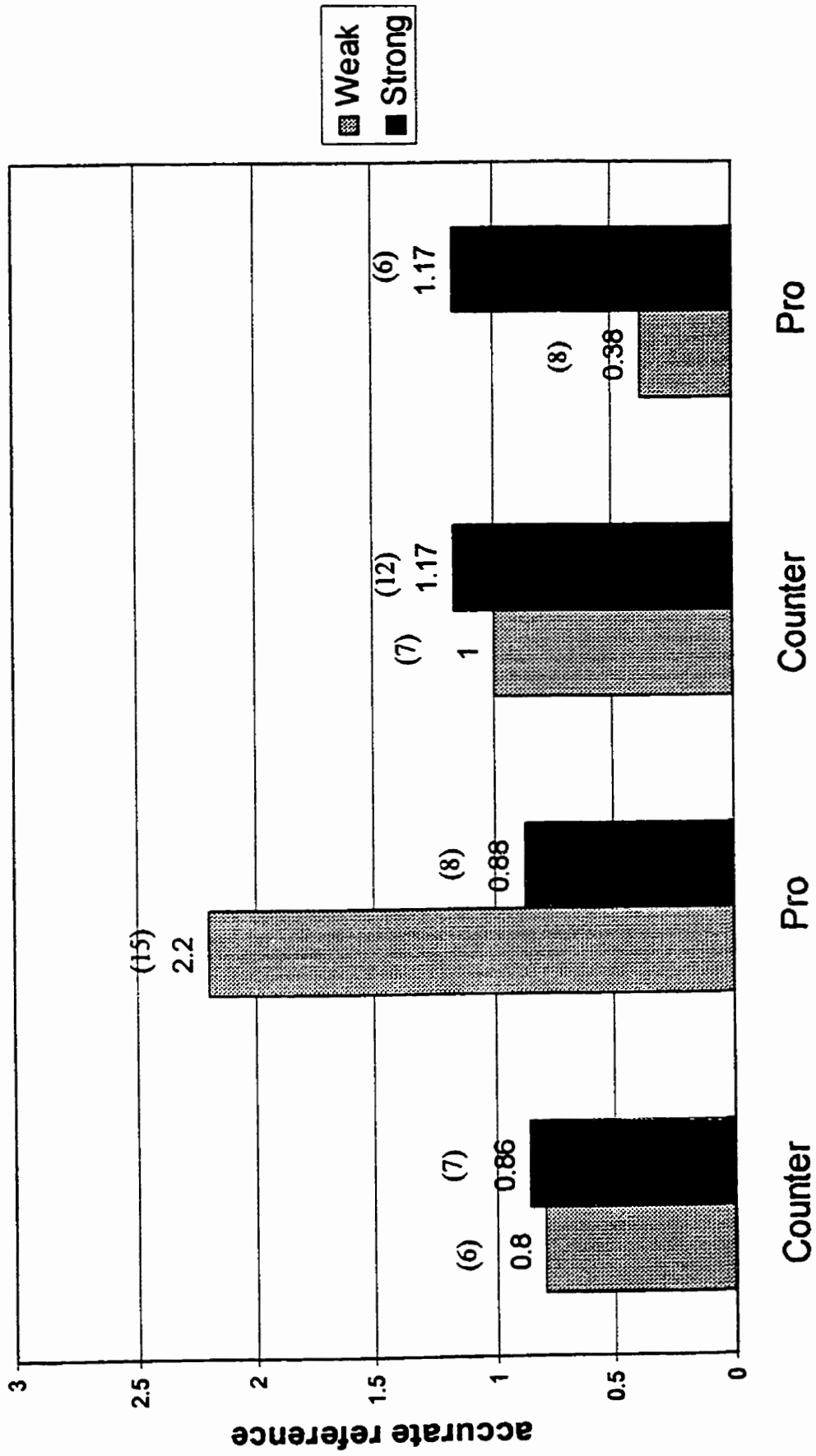


Figure 1-6a. Uncertainty-oriented participants' accurate message reference as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

Certainty-Oriented (CO) Participants



Ingroup

Counter

Outgroup

Figure 1-6b. Certainty-oriented participants' accurate message reference as a function of Source and Quality of message, and initial Position of attitude (Pro=proattitudinal; Counter=counterattitudinal). Cell sizes in parentheses.

UO) X 2 (Source: ingroup vs outgroup) X 2 (Argument Quality: weak vs strong) X 2 (Position: counterattitudinal vs proattitudinal) between-participants ANOVA (see Table 1-15, Appendix C). A significant Position main effect demonstrates that proattitudinal ($M = -.33$, $SD = 2.68$) participants listed fewer negative thoughts than did counterattitudinal ($M = -1.22$, $SD = 3.07$) participants, $F(1, 118) = 3.99$, $p < .048$. No other effects approached significance.

Source-Related Thoughts. A similar favourability index was created based on thoughts related to the delegate, and was submitted to a similar ANOVA (see Table 1-16, Appendix C). This analysis revealed that UOs ($M = -2.00$, $SD = 3.54$) tended to list fewer positive thoughts than did COs ($M = -1.26$, $SD = 2.47$), $F(1, 118) = 2.98$, $p < .087$. This marginal effect was subsumed by a significant Uncertainty Orientation X Source interaction, $F(1, 118) = 5.00$, $p < .027$, and a Source X Position interaction, $F(1, 118) = 8.91$, $p < .003$. No other significant effects were found.

Self-Related Thoughts. Likewise, a positive minus negative self-related index was created and submitted to a 4-way ANOVA for analysis (see Table 1-17, Appendix C for summary). A marginal Position main effect revealed that participants who were counterattitudinal ($M = -.27$, $SD = .74$) listed fewer positive thoughts than those who were proattitudinal ($M = -.09$, $SD = .50$), $F(1, 118) = 3.82$, $p < .053$. This pattern was subsumed by significant Argument Quality X Position interaction, $F(1, 118) = 7.19$, $p < .008$, and Uncertainty Orientation X Argument Quality X Position interaction, $F(1, 118) = 5.41$, $p < .022$. This latter pattern shows that for COs, strong arguments ($M = .00$, $SD = .33$) resulted in fewer negative self thoughts than did weak arguments ($M = -.62$, $SD = 1.12$) when the message was counterattitudinal, but the reverse pattern when proattitudinal ($M =$

-.29, $SD=.47$ vs $M=.17$, $SD=.49$ respectively). For UOs, predominantly negative thoughts were found when receiving counterattitudinal (strong $M=-.22$, $SD=.44$ vs weak $M=-.33$, $SD=.77$) or proattitudinal (strong $M=-.19$, $SD=.51$ vs weak $M=-.18$, $SD=.39$) messages. No other effects were statistically significant.

Relation Between Cognitive Responses and Post-Exposure Attitudes. In order to further explore the effect of ingroup vs outgroup message source on post-exposure attitudes toward comprehensive exams, a series of regression analyses were conducted. These analyses are based on those reported by Mackie et al. (1990). Indices of favourability were computed for each of these three measures of favourability: Content favourability (favourable minus unfavourable message-related thoughts), Source favourability (favourable minus unfavourable source-related thoughts), and Self favourability (favourable minus unfavourable self-related thoughts). Each of these measures, along with Accurate Reference, were directly entered into a series of regression equations to predict attitudes toward the exams.

As revealed in Table 1-18, both COs and UOs show significant prediction of attitudes by Content favourability ($\beta=.61$, $p<.001$; $\beta=.49$, $p<.001$, respectively) when the message is delivered by an Outgroup source. For Ingroup messages, Content favourability approaches significance for both COs and UOs (both $\beta=.34$, $ps<.10$). Interestingly, for Ingroup messages, UOs show significant prediction by Self-related favourability ($\beta=.45$, $p<.05$). Note that UOs also show a marginal tendency for this effect under Outgroup message conditions ($\beta=.27$, $p<.10$).

A true test of the assumptions of the model tested in the present study, however, would examine the influence of attitude position (i.e., counter- vs pro-attitudinal) in these

Table 1-18

Prediction of Post-Exposure Attitudes Toward Comprehensive Exams by Favourability of Content, Source, and Self-Relevant Responses and Accurate Recall of Arguments as a Function of Uncertainty Orientation.

Predictor Variables	<u>Certainty-Oriented</u>		<u>Uncertainty-Oriented</u>	
	Ingroup	Outgroup	Ingroup	Outgroup
Content Fav.	.34 [‡]	.61***	.34 [‡]	.49**
Source Fav.	.06	.09	-.22	.09
Self Fav.	.22	-.10	.45*	.27 [‡]
Accurate Recall	.02	-.21	-.13	.05

Note: Numbers are betas. Fav = favourability. [‡] p<.10, * p<.05, ** p<.01, *** p<.001

analyses. As has been repeatedly demonstrated in the Results section thus far, consideration of Position is crucial to the understanding of the persuasion process. However, regression analyses were not possible to test these effects due to sample size restrictions. Nonetheless, these results are useful for comparison with Mackie et al. (1990), where they found that content favourability predicted attitudes for ingroup and not outgroup messages.

Discussion

The present study found support for the expectation that information-processing in the persuasion context would vary as a function of ingroup and outgroup categorization, the extent of agreement or disagreement with these social categories and the ensuing levels of uncertainty, and personality differences in the uncertainty orientation of message recipients. As predicted, the principal dependent measures (post-exposure attitudes, persuasiveness, argument strength, delegate trustworthiness, delegate expertise) demonstrated a multivariate Uncertainty Orientation X Source X Argument Quality X Position interaction ($p < .058$). This general pattern, demonstrated across several variables, indicates that UOs showed higher evaluations following strong than weak arguments under conditions of relatively high social uncertainty (i.e., disagreement with ingroup, agreement with outgroup) compared to low uncertainty (i.e., agreement with ingroup, disagreement with outgroup). COs showed the opposite pattern, demonstrating more strong vs weak argument differentiation, for the most part, under conditions of certainty than uncertainty (see Figures 1-1a/b, 1-2a/b, 1-3a/b, 1-4a/b).

The social cognition literature generally asserts that differentiation between strong and weak arguments reflects systematic or central route processing (Chen & Chaiken, 1999; Chaiken, 1980; Eagly & Chaiken, 1993; Petty & Cacioppo, 1981; Petty & Wegener, 1999; Sorrentino et al., 1988). That is, when participants show more favourability toward strong than weak arguments, they are carefully scrutinizing the arguments, paying attention to the quality of the message itself and relying less on heuristic or peripheral cues. In the context of the present investigation, therefore, clear support has been found for the prediction that UOs would show the most evidence of

systematic information-processing under the most uncertain (or expectancy incongruent) conditions. These uncertain conditions were operationalized as situations where one disagrees with an ingroup member or agrees with an outgroup member. COs, on the other hand, showed strongest evidence of systematic processing under conditions of relatively high certainty (agreement with an ingroup, disagreement with an outgroup).

These findings are consistent with the general model of uncertainty orientation (Sorrentino et al., 1999; Sorrentino & Roney, 1999; Sorrentino & Short, 1986), and with persuasion studies showing increased systematic and decreased heuristic processing under highly relevant (and potentially uncertain) conditions for UOs, and increased heuristic and decreased systematic processing under highly relevant conditions for COs (Sorrentino et al., 1988).

Of course, these interpretations are based on acceptance of the assumptions that disagreement with ingroups creates uncertainty (McGarty et al., 1993; Turner, 1985) and that differential evaluation of strong and weak arguments is indicative of systematic information processing (Chaiken, 1980; Petty & Cacioppo, 1981; Petty & Wegener, 1999). Given the broad acceptance of these basic principles, however, and the predictions derived through the uncertainty orientation model and past research, a strong case is made for systematic processing by UOs under conditions of uncertainty and by COs under certainty, where uncertainty was created through “conflicts” based on social categorization and personal attitudes. This interpretation is also supported by the marginally significant interaction for the change in importance ratings of comprehensive exams. Figure 1-5a reveals that UOs somewhat increased their ratings of exam importance more for strong than weak argument conditions under high conditions of

uncertainty, mirroring the findings with the other measures. The pattern for COs illustrated in Figure 1-5b shows this strong vs weak difference to be significant in only one situation (high certainty - disagreement with outgroup). These data suggest that, not only were evaluations toward the exams, message persuasiveness, and the speaker influenced by personality and uncertainty created due to initial attitude positions, but that evidence of systematic processing was, for the most part, accompanied by changes of attitude importance consistent with this pattern.

An interesting story emerges when comparing how COs rate comprehensive exams (Figure 1-1b) and persuasiveness of the communication (Figure 1-2b). Based on the persuasiveness ratings, we see evidence of systematic processing exactly where expected (agreement with ingroup, disagreement with outgroup). This pattern is actually supported for both the attitude and persuasiveness measures in the ingroup-proattitudinal condition, as expected. But examination of the counterattitudinal-outgroup condition reveals that the strong vs weak pattern is considerably diminished for the attitude ratings. Based on the persuasiveness measure, it is clear that these COs *were* able to differentiate between strong and weak arguments, signalling systematic processing. Based on the attitude measure, however, we see that they are not more willing to accept the message.

In a similar light, Hodson and Sorrentino (1997) found that COs under more certain group conditions (i.e., high cohesion) more carefully considered the facts in a decision-making task, but this had no impact on the decision reached. At this point, they were strongly biased by the opinion of the group leader. This is also consistent with research by Hanna (1998), where COs showed stronger ingroup identity and rejection of the outgroup. In the present case, although COs were willing to carefully process a

counter-attitudinal outgroup message and rate strong messages as more persuasive than weak ones, presumably because consideration of the message would pose little threat of uncertainty in terms of social categorization, they were reluctant to accept the message. This message did originate, after all, from an outgroup source that held an opposing opinion on the topic, which would not be appealing to a CO person. Crano and Avaro (1998) have argued that attitudes might not necessarily change even though systematic-processing may be evident. They suggest that attitudes might change indirectly, where attitudes toward the specific topic might not alter, but attitudes on a related topic may be influenced by the arguments. This would be an interesting avenue to pursue in future research. That is, would COs under these circumstances show stronger attitude favourability on a related attitude topic? Whatever the mechanisms responsible, this tendency may have suppressed the overall interaction pattern for the attitude measure.

The thought-listing data also revealed some interesting findings. Figures 1-6a and 1-6b show considerable argument reference for weak proattitudinal arguments for UOs when they originate from an outgroup and for COs when delivered by an ingroup. Given that this occurs under the conditions where greater systematic processing was expected, and indeed found with the earlier measures, it would appear that weak arguments may have been particularly salient under these conditions. That is, in listing their thoughts, participants mentioned the weak arguments a great deal, likely due to their bizarre nature, which would have become all the more evident due to the systematic processing.

The relationship between cognitive responses and post-exposure attitudes (see Table 1-18) are somewhat exploratory in nature but worthy of discussion. These findings run somewhat contrary to those of Mackie et al. (1990) because they show evidence of

systematic information processing, reflected in a direct relation between message content favourability and post-exposure attitudes, but this relation is stronger for outgroup than ingroup messages. These findings were similar for both personality types. Collapsing across initial attitude conditions, therefore, outgroup messages showed strong signs of cognitive elaboration. These findings should be interpreted with caution however, given that: (a) strong and important effects were found when including initial attitude positions (e.g., see especially Figures 1-2a, 1-2b), which allowed an examination of uncertainty as dictated by social categorization; and (b) such elaborations were collected *after* exposure to the message, questioning the interpretation of direct mediation (see also McGarty et al., 1994 for a similar criticism).

In summary, therefore, the present study found some support for the notion that acceptance of a message would be contingent on social categorization effects and personality. UOs engaged in more systematic (vs less deliberative) processing under conditions of relative uncertainty and expectancy incongruence based on social categorization (i.e., disagreement with outgroup, agreement with outgroup). COs increased careful processing under relatively certain conditions (i.e., agreement with ingroup, disagreement with outgroup).

These findings have implications for extant persuasion models. In the social cognition tradition, the elaboration likelihood model and heuristic-systematic model have treated message source most typically as a cue that serves a peripheral or heuristic role to the audience member (see Chaiken et al., 1996; Petty et al., 1994). In other words, these models view the message source as being *less* important to the issue of systematic processing, particularly in relation to consideration of the message quality itself (Van

Knippenberg, 1999). Although this criticism does simplify the issue somewhat, it is the case that message-based processing is reflective of deliberative processing in these models. Interest in the present study was sparked by a debate in the literature concerning the role of group categorization in the persuasion process. Do ingroup categories serve as heuristic cues, allowing for simple and relatively effortless guides to social reality, or do they serve to stimulate the careful processing of information due to the high relevance of the message source?

The present data suggest that the answer to this basic question might be more complex than these persuasion theories suggest. Two issues seem particularly pertinent. First, researchers would be wise to avoid the “either-or” thinking that has to some extent dominated this literature. Budesheim et al. (1996) correctly remind the reader that systematic and heuristic processing can co-exist (Chaiken et al., 1989; Eagly & Chaiken, 1993)⁸, and that careful vs shallow processing differences exist along a continuum (Fiske & Neuberg, 1990; Petty & Wegener, 1999). Considered in this light, we might not look to simple systematic-vs-heuristic solutions to the issue of category-based influence on information processing. Second, the importance of personality differences, particularly as they pertain to coping with uncertainty, should not be understated in this process. Unlike the Sorrentino et al. (1988) persuasion studies, uncertainty was operationalized in the present study in terms of social categorization. Here, uncertainty was operationalized in terms of expectancy violation based on social categories. That is, uncertainty was created by disagreement with the ingroup and agreement with outgroup along a dimension relevant to group membership. This element interacted with personality, determining the

⁸ The ELM is rather silent on the possibility of the two persuasion routes co-existing.

extent to which ingroup and outgroup categories were used in a systematic or heuristic matter in information-processing.

The uncertainty orientation construct aided in understanding the relationship of ingroup/outgroup categories and systematic information-processing. It is possible that previous researchers were on the wrong track, so to speak. Based on the present investigation, it appears that what is important to this process is how socially-based uncertainty and uncertainty orientation influence information-processing.

The role of individual differences in this domain has traditionally been hampered by the fact that social identity and self-categorization perspectives shun individual approaches to influence and uncertainty reduction (e.g., Abrams & Hogg, 1990; Hogg & Mullin, 1999; Hogg, in press). On the flip side of the coin, the social cognition literature has hampered this study because these researchers typically treat group categories as factors that exist for the most part separate from messages. It is suggested here, therefore, that although uncertainty can be created through categorization processes, personality differences might determine how an individual reacts to such uncertainty. This returns us to our earlier theme. That is, social categories might serve different purposes for people with different cognitive styles (Sorrentino, Hodson, & Huber, in press; Sorrentino & Roney, 1999). Likewise, social cognition researchers should consider that not all people are motivated to process information carefully to the extent that an issue is important, diagnostic, or high in uncertainty (see Sorrentino et al., 1988). Successful integration of social identity and social cognition perspectives (see Abrams & Hogg, 1999) approaches might benefit from adoption of an individual difference approach such as uncertainty orientation.

In a related vein, Shah, Kruglanski and Thompson (1998) have recently investigated the role of need for cognitive closure in this context. Briefly, high need for closure individuals (dispositional or situationally induced) are people motivated to seek rapid closure to a question or issue, presumably in the service of dealing with confusion and uncertainty. Shah and colleagues found that those high (vs low) in need for closure showed stronger liking of ingroups and disliking of outgroups (Studies 1 & 2) and increased likelihood of social influence by an ingroup source on a novel or new issue (Study 3). High need for closure individuals, therefore, show a strong tendency to be group-oriented and attached to their groups, and readily conform to their ingroup, especially when an answer is desired. These studies, though interesting, did not directly pit heuristic and systematic processing modes against one another, and hence are rather silent on this overall topic. These recent studies, in conjunction with the present investigation, suggest that it is profitable to examine personality differences in the context of persuasion and social influence.

Issues and Future Directions

The conclusions reached concerning the present study must of course be viewed in light of the specific procedures employed. First, the social categories were broad, collective identities (i.e., University of Western Ontario/Ottawa membership). Having just completed their initial freshman orientation “indoctrination”, these groups were real, highly salient, and important to the participants. However, this experiment did not involve face-to-face ingroup disagreement found by small groups, where one might expect even stronger effects. Second, the comprehensive exam attitude topic could threaten participants’ social categorization (because exam failure could remove them

from their category), as opposed to the SAT (university *entrance* exams) topic used previously in this domain (e.g., Mackie et al., 1990, 1992; Van Knippenberg & Wilke, 1992; Van Knippenberg et al., 1994). In the present study, the delegate spoke in *favour* of comprehensive exams, as opposed to speaking *against* SAT exams. This difference might have implications for social influence processes, as the goals and motives of the speaker might be interpreted differently. Nonetheless, the present findings suggest that agreement or disagreement with the source itself is an important factor, presumably to the extent that this position is relevant to group membership.

Ingroup identification should also play an important role in these processes. According to social identity theory, intergroup behaviour should exist to the extent that group members identify with their ingroup. Unfortunately, ingroup identification was not measured in Study 1. One would expect increased identification to exacerbate the obtained effects. In addition, expectancy violation effects should be stronger to the extent that groups have a prolonged history, in part due to higher expected identification, but also due to increased confidence in the expectancy of the group's attitude.

One issue that should be addressed concerns the attitude measures collected in Study 1. Although interesting and meaningful effects were found for the principal desirability rating of comprehensive exams, no differences were found on the items that assessed the extent to which such exams are good-bad, wise-foolish, beneficial-harmful (see Appendix A). It is unclear why this is the case. It is possible that participants were confused by the presentation of these variables. While the main attitude measure ranged from undesirable to desirable, these measures were presented favourable to unfavourable. This may have puzzled participants, as might labels such as "wise" and "foolish" to

describe an exam. Such terms usually apply to people or courses of action. Although these measures are of secondary importance, it is still unclear why these variables did not show any reliable effects.

To some extent, the general confusion concerning the role of categorization in information processing routes arises due to the operationalization of systematic vs heuristic processing. Despite a general acceptance of the dual-process route to persuasion, researchers do not necessarily agree on the operationalization of systematic processing. There are two basic indices of systematic processing: (a) the differentiation in evaluation of strong vs weak arguments; and (b) the positive relation of favourable cognitive elaborations (based on thought-listing data) and reported attitudes. The latter criterion is somewhat weaker, one could argue, given that these measures are collected after attitudes are reported, and may reflect cognitive activity influenced by the reporting of the attitude. In addition, these thoughts are self-selected, and participants may engage in considerable monitoring and editing of these thoughts. It is questionable, therefore, whether one should treat such measures as true indices of cognitive mediation. The former criterion seems more important, as it indicates that content-related processing and argument scrutiny have occurred, enabling participants to evaluate message quality, resulting in more favourable attitudes following strong than weak messages.

The confusion in part stems from the fact that different researchers focus on different criteria. While Mackie et al. (1990, 1992) find evidence of both types (at least for ingroup messages), Van Knippenberg and associates (Van Knippenberg & Wilke, 1992, Van Knippenberg et al., 1994) claim the presence of systematic processing even in the absence of the strong-weak argument differentiation, basing their conclusions on their

thought-listing data. Although these measures may also reflect careful processing, it is difficult to argue for systematic processing when participants adopt an ingroup's position regardless of the message quality. If one accepts this interpretation, it becomes necessary to question seriously what we mean by systematic processing. Not all researchers follow the traditional social cognition approach in addressing the issue. Therefore, the studies based on the self-categorization approach (e.g., McGarty et al., 1994) do not include argument quality as a variable, making it difficult to compare results across studies. This is not to say that there can only be one criterion, but rather that researchers should recognize that chosen criteria may influence conclusions derived.

As a final point in this section, the issue of social comparison could be quickly addressed. Although social identity and self-categorization theorists such as Turner (1985) have suggested that people look to similar others (i.e., ingroup) for validation, others have argued that it is often more useful and desired to look to dissimilar others. According to this "triangulation" perspective (Goethals & Nelson, 1973), agreement with similar others might be discredited due to assumed biases shared with ingroup members. Outgroup members, on the other hand, should be less biased in this manner. As noted by Mackie et al. (1990), however, this research domain concerns attitude formation and confidence, not persuasion, and hence is less relevant to the present concerns.

Olson, Ellis, and Zanna (1983) suggest that, to the extent that a person is interested in information from others when making subjective judgements, that person should look to consensus (i.e., ingroup) information. Roney and Sorrentino (1995b) have found that UOs were more interested in comparing their scores on a values task with others than were COs, regardless of whether the information came from an allegedly

similar or dissimilar other. Again, this supports the assertion that UOs will look to social categories, be they ingroups or outgroups, for informational purposes relevant to the resolution of uncertainty. In the present study, increased motivation and careful processing occurred as a function of categorization, uncertainty, and one's personality.

Concluding Remarks

In investigating the role of group categorization effects on the nature of persuasive message processing, the present study introduced an individual difference approach to help understand two often competing perspectives. As predicted, UOs differentiated between strong and weak arguments (reflecting systematic information processing) under conditions of uncertainty (as defined by expectancy violations based on social categorization). COs showed more evidence of this careful processing under conditions of certainty. The issue of category-instigated motivation to process information is more complex than many theories might predict. These data suggest that consideration of *who* (ingroup vs outgroup) says *what* (proattitudinal vs counterattitudinal message) to *whom* (UO vs CO) aids in understanding categorization in the context of persuasion.⁹

Study 2 of this dissertation maintains its focus on the role of uncertainty orientation in categorization processes. In Study 2, however, the focus shifts from social influence and persuasion to the arena of intergroup discrimination. While Study 1 addressed when ingroup or outgroup categories can serve as heuristics or information-processing motivators, Study 2 addresses the role of categorization in the allocation of resources. This time we will ask which personality type favours the ingroup over the

⁹ Lasswell (1948) is credited with noting that traditional approaches to persuasion focused on the question of "Who says what in which channel to whom with what effect."

outgroup, and under what conditions. In other words, can the ingroup category serve as a heuristic rule for guiding behaviour in a resource distribution situation? We now turn to this issue.

CHAPTER III – STUDY 2

Uncertainty Reduction in Groups: The Role of Categorization

Study 1 demonstrated the importance of social identity in the creation of uncertainty, and of personality differences in how social categories were influential in dealing with the uncertainty. Study 2 focuses on how group members use social categories as decision-making tools when faced with uncertainty that is not directly related to group membership. In this case, the issue of interest is whether people, when uncertain about the appropriate strategy for resource allocation, will use their ingroup category as a heuristic to resolve the uncertainty.

The role of the social environment in defining reality (see Festinger, 1950, 1954; Hardin & Higgins, 1996; Moscovici, 1976; Turner, 1985) has been discussed in Study 1. In brief, social identity and self-categorization approaches suggest that: (a) people turn to their social ingroups for answers and validation (e.g., Abrams et al., 1990); and (b) uncertainty can result from a disagreement with others with whom one expects to agree, such as a relevant ingroup (Turner, 1985). Note, however, that Study 1 demonstrated that personality differences in uncertainty orientation can moderate these processes. Social identity theory and self-categorization theory go further, however, and stipulate that certainty is achieved through the identification with (and immersion into) a favourable ingroup category. Hogg and colleagues have begun to explore some of these issues, and we will turn now to their work.

Social Identity and Motivation. Tajfel (1969; Tajfel & Billig, 1974) initially held that stereotyping and other forms of intergroup behaviour may represent the motivated need to search for coherence (i.e., a set of consolidated and consistent ideas about a social

category). Tajfel (1972) soon replaced his emphasis on the coherence-seeking motive with the self-enhancement motive, arguing that group members make their ingroup category distinct from the outgroup category along dimensions that are relevant and positive in terms of social (and self) identity. Among others, Abrams and Hogg (1988) have questioned the motivational role of self-esteem in the phenomenon of social identity, including the issue of whether self-esteem is a cause or a consequence of categorization and intergroup behaviour (see Abrams & Hogg, 1988; Hogg & Abrams, 1993; Hogg & Sunderland, 1991; Jetten, Spears, & Manstead, 1997; Lemyre & Smith, 1985; Lindeman, 1997).

In short, there is mixed support for the notion that individuals identify with groups and engage in intergroup behaviour for the purpose of achieving a positive group (and hence self) identity. Abrams and Hogg (1988, p.328) conclude that “another motive which deserves attention is the search for meaning” (see also Shah et al., 1998). This view re-asserts Tajfel’s (1969) earlier view that motives for group structure and integrity are fundamental to group behaviour (Abrams & Hogg, 1990). In other words, group identities primarily function as a source of meaning and coherence for the social environment. This is in keeping with the self-categorization theory’s perspective that social identities are meaningful constructs that help individuals to make sense of their world.

Hogg and Abrams (1993) suggest a single-process model of group motivation based upon self-categorization theory (see also Turner, 1991). The authors note that traditional dual-process models of group motivation stress self-evaluation and self-enhancement, as reflected by informational and normative influences respectively. Dual-

process models typically emphasize the dependence of individuals upon other members in the group as either a source of information or norms. Self-categorization theory sees these two types of influence being intertwined (Abrams & Hogg, 1990). Hogg and Abrams (1993) review many motivational constructs that traditionally have been considered by researchers, including self-esteem, self-knowledge, search for meaning, need for balance and consistency, need for power and control, self-efficacy, and affiliation. In response to these models, Hogg and Abrams make two basic assertions. First, dual-process models devote too much attention to interpersonal processes, and essentially ignore the fact that “influence in groups is a *group process*” (Hogg & Abrams, 1993, p.182 [italics in original]). They stress that group belongingness, not interpersonal dependence, is important to group functioning. Second, they suggest that each of the alternative group motives (listed above) serves the higher-order motive of reducing uncertainty (see also Kagan, 1972).

Key to the perspective offered by Hogg and Abrams (1993, p.186) is the assertion that “people are motivated by a need to reduce subjective uncertainty” and that “uncertainty is reduced by agreement with others who are categorized as similar to self” (see also Turner, 1985). That is, certainty is desired by all people, and can be achieved through agreement with an ingroup, in turn increasing the value of (and attraction to) the ingroup. From this perspective, agreement with similar others (or rather, the perception of agreement) is crucial to the formation of a social category. For instance, membership in the Democrat political party would only be meaningful to the extent that group members agreed on key political positions relevant to their shared social identity. Uncertainty is reduced when group members internalize prototypes of their group (Hogg

& Abrams, 1993; Hogg & Mullin, 1999). These prototypes are perceived to be consensual, and thus reduce uncertainty in the group environment. Given that the self is also defined in terms of the social identity, this should also serve to diminish uncertainty about the self, although the authors do not address this point directly.

Consistent with the basic tenets of self-categorization theory, the model by Hogg and Abrams (1993) suggests that group definitions vary as a function of the social environment. For instance, a person might categorize himself as a Canadian when in the presence of an American, but as a man when in the presence of a woman. Given the fluidity of categorization, self definitions can easily become incongruent with one's group identity, and uncertainty can ensue. That is, a man's attitude might be consistent with ingroup attitudes when the ingroup is "Canadian", but no longer be consistent with the ingroup when the identity is switched to that of "man." To counteract the unpleasant state of uncertainty, the authors suggest that:

one can restructure the ingroup prototype in line with changing circumstances, or one can redefine erstwhile 'similar' others as no longer similar – one can effectively recategorize oneself as a member of a different group and seek uncertainty-reduction through internalization of that group's consensus, as embodied by its prototype (Hogg & Abrams, 1993, p.186).

Alternatively, various cognitive strategies may be employed, such as devaluing the source or the information, or outright denial of the information.

Hogg and Abrams (1993) suggest that the consequence of uncertainty reduction is positive affect. Indeed, the authors are careful to note that the process may appear to be quite cognitive, but that in fact "the entire mechanism is permeated by strong feelings" (Hogg & Abrams, 1993, p.186). Because group members prefer identity consensus to disagreement, prototypical ingroup members are rated as attractive. Outgroups are

consequently disliked because of the uncertainty that they can introduce; outgroups share a different reality than that shared by the ingroup, almost by definition of the categorization process.

In terms of motivation, therefore, Hogg and Abrams (1993; Hogg & Mullin, 1999) contend that uncertainty-reduction is the most fundamental motivation in group processes. Other motives, such as self-esteem enhancement, are considered “derivative” motives, serving the ultimate goal of uncertainty reduction. According to this position, positive social identities are desirable because these identities signal certainty, and self-esteem benefits are of secondary concern. This uncertainty-reduction function is best served by the categorization process, which serves to define reality through the presence of consensual prototypes. Thus, the motive to reduce uncertainty is an individual motivation, acted upon through group processes (i.e., the process of categorization and the sense of belongingness). In short, identification with an ingroup category leads to depersonalization of the self and other ingroup members, and to intergroup behaviour favouring the ingroup, all in the service of reducing uncertainty.

Insofar as these researchers are concentrating on the informational component of group behaviour (i.e., uncertainty reduction), personality differences in uncertainty orientation should become directly relevant. To the extent that the focus would be on the affective importance of groups, these affective concerns would be less directly relevant yet still interact with the informational aspects (see Sorrentino et al., 1999) in much the same manner as uncertainty orientation interacts with the affectively-based need for achievement motive. This issue is beyond the current body of work, and will not be further addressed.

In a more general sense, however, we should at least recognize that there are multiple, equally important motives relevant to group behaviour (cf. Hogg & Abrams, 1993). For instance, some have suggested that groups are important due to basic and evolved survival needs that show in contemporary life (e.g., Baumeister & Leary, 1995; Buss, 1996). On the other hand, Festinger (1950, 1954) suggests that we are motivated to test the validity of our beliefs through interpersonal consensus, while Hogg and Abrams (1993) have shifted their focus to group consensus. While groups could serve to enhance self-esteem, this position has been seriously challenged (see Hogg & Abrams, 1988). Likewise, it is conceivable that the self-categorization position as forwarded by Hogg and Abrams (1993; Hogg & Mullin, 1999) will prove too narrow in its focus. That is, uncertainty reduction may not be the only important motive relevant to group behaviour. Rather, both informational (knowing vs not knowing) *and* affective (feeling good vs feeling bad) factors may be involved, in addition to basic survival needs. Nonetheless, current models, such as the one forwarded by Hogg and Abrams, have focused on cognitive and informational issues, and the present investigation will share this focus.

The Minimal Group Paradigm, Resource Allocation, and Uncertainty

The literature review will focus on applications of the minimal group paradigm and the employment of the so-called "Tajfel matrices" (e.g., Tajfel et al., 1971) in the investigation of uncertainty reduction. Use of these matrices requires participants to allocate resources between ingroup and outgroup members, where categorization is typically based on a previously meaningless criterion and the participants have no previous history with either group. Because no resources can be allocated to the self, this paradigm is believed to represent group-oriented behaviour.

The first researchers to stress the crucial role of uncertainty reduction in the process of social categorization were Tajfel and Billig (1974). They followed Sherif and Harvey's (1952) observation that research participants are more influenced by one another under conditions of situational uncertainty. Tajfel and Billig predicted that uncertainty would increase intergroup discrimination, where identification with one's own group would reduce the uncertainty. Boys between the ages of 14 and 15 were randomly assigned to a condition of situational familiarity (certainty) or unfamiliarity (uncertainty). According to this manipulation, participants were either made familiar with the testing situation or were not given this opportunity. Participants were assigned to social categories, allegedly based on their preferences for the painters Klee or Kandinsky, though in reality they were randomly assigned. Those in the familiarity condition were remixed so as not to have had any previous ingroup experience. Participants individually worked on Tajfel matrices, a task with the goal of awarding points, transferable into money, to individual members of each group. Use of this method had previously shown that group members demonstrate ingroup bias, assigning more points to their ingroup than to an outgroup, even when it was explicitly stated that participants would not benefit personally from the transaction (Tajfel et al., 1971).

Contrary to expectations, Tajfel and Billig (1974) found that, although groups in both conditions demonstrated ingroup favouritism on all measures, the effect was significantly stronger for those in the familiar (i.e., certain) condition. Groups in the familiar condition also showed more fairness in their point allocations, and demonstrated more consistent responding. The authors speculated that category-based group discrimination is the norm in group behaviour, and that those in the familiar

(certain) condition were more at ease to act in the manner that is normal in groups. Those in the unfamiliar (uncertain) condition were possibly acting in a sensitive, careful manner. They conclude by stating that “‘uncertainty’ must be brought back into a social context and considered in the light of its interaction with this context rather than be treated as a purely cognitive variable” (Tajfel & Billig, 1974, p.170). Mullin and Hogg (1998) suggest that Tajfel and Billig were too quick to reject the initial hypothesis, proposing instead that the authors might simply have manipulated uncertainty (through the nature of their filler task) when they thought that they were manipulating certainty. This, however, is purely speculative. It is unclear why Hogg and Mullin (1998) can so casually dismiss this study in their subsequent treatment of uncertainty in groups.

Hogg and Grieve (in press, reported in Hogg & Mullin, 1999) conducted a study based on the original work by Tajfel and Billig (1974). The rationale underlying this study, as with the others by Hogg and colleagues, hinges on the belief that the minimal group situation, in combination with the Tajfel matrices, presents the participant with a highly uncertain situation. In their subsequent studies, they have virtually replicated the research design employed by Tajfel and Billig. Participants in the Hogg and Grieve study were either categorized (i.e., explicit random assignment to a group label) or uncategorized (i.e., given a participant number but no group number). Independent of this manipulation they were placed into a low or high uncertainty condition; in the low uncertainty condition, practice matrices were given to participants to reduce uncertainty, where no such practice trials were given to those under high uncertainty conditions. Results of the study revealed that ingroup bias, demonstrated by the use of strategies favouring the ingroup, were found only for categorized participants under high

uncertainty conditions, as expected. Participants under these conditions also demonstrated increased self-esteem and reduced ratings of uncertainty. However, support was weak for the notion that these individuals experienced increased identification with their ingroup. This finding is troublesome to self-categorization theory, as this is a crucial element in its framework.

Two follow-up studies by Grieve and Hogg (in press) revealed similar results, at least in terms of ingroup bias. In these studies, the number of practice trials was increased from 3 to 12 (to strengthen the manipulation), and the identification measure was expanded (from 5 items to 10). In Experiment 1, the authors predicted that only participants in the categorized, high uncertainty condition would show ingroup bias (favouritism in resource allocation aimed at the ingroup), increased ingroup identification, a decrease in reported uncertainty, and an increase in self-esteem. The design and procedure was very similar to Hogg and Grieve (in press), with the above exceptions. A filler task was provided to participants under high uncertainty conditions during the time period where those in low uncertainty conditions completed the practice trials. Main effects revealed significantly more ingroup bias for those in the categorized than uncategorized conditions, and more ingroup bias under high than low uncertainty conditions. However, these variables interacted so that ingroup bias was only found for categorized participants under high uncertainty. Unlike Hogg and Grieve, participants under this experimental cell of interest showed increased identification with the ingroup, and no significant effect for self-esteem (though the means were in the predicted direction). More striking was the finding that, although completion of the matrices reduced uncertainty when collapsing across conditions, there was no change in the rating

of uncertainty based on categorization differences. That is, ingroup bias for those in the categorized, high uncertainty condition was not accompanied by a reduction of uncertainty, contrary to predictions. The authors suggest the possibility participants were therefore acting on the basis of a social heuristic (rather than a group-based one), although the findings were not due to reported awareness of others. Grieve and Hogg are very unclear what they mean by this explanation. Nonetheless, it shows that they *expected* participants to allocate resources via heuristics of some description.

In Experiment 2, Grieve and Hogg (in press) maintained the use of the Tajfel matrices, but manipulated uncertainty independently. Participants described a variety of ambiguous TAT slides (high uncertainty condition) or unambiguous slides (low uncertainty condition). The use of practice matrices to create a low uncertainty condition was therefore not employed in this study. Those in the categorization condition were told that they would later interact with others to reach a common description, whereas uncategorized participants were told that they would simply return to the slides later. After completing the matrices, participants provided a variety of self-report ratings. As in Experiment 1, categorized participants showed more ingroup bias than did uncategorized participants, and more ingroup bias was found under high than low uncertainty conditions. As expected, most ingroup bias was found for participants categorized under high uncertainty. Increase in ingroup bias for this cell was accompanied by an increase in ingroup identification. Little support was found for self-esteem differences across conditions, and reported changes in uncertainty were not measured by the researchers.

Mullin and Hogg (1998) examined the effects of both task uncertainty and situational uncertainty on the categorization and discrimination processes. The design of the study was a 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) X 2 (Situational Uncertainty: low vs high) between participants design. Ingroup bias was again assessed via the Tajfel matrices. Categorized participants were informed that they were randomly assigned to category X (vs Y), whereas uncategorized individuals were simply aggregated with other people. All individuals completed the task individually in rooms with other participants present, and all were secretly given the same identification number. Very basic instructions on the use of the Tajfel point allocation matrices (see Methods section of present study) were presented to everyone. Those in the low task uncertainty condition were given very detailed instructions on the use of the matrices, six practice trials, and were told that there were no right or wrong answers to the distribution task, while those in the high task uncertainty condition completed a filler task. Participants were classified as being in the low situational uncertainty condition if they had previously completed at least five psychology studies (and hence were more comfortable with the testing environment), and in the high situational uncertainty condition if they had never participated in a research study. Various measures of uncertainty (measured at three times), self-esteem, social awareness were administered.

Mullin and Hogg (1998) found basic support for the hypothesis that intergroup behaviour is accentuated when people are categorized under conditions of uncertainty (both task and situational). Moreover, the highest levels of ingroup bias and group identification were found for those high in both types of uncertainty. These findings

were not due to reported awareness of others. As the experiment progressed, participants reported higher certainty (collapsing across conditions), but, as with Grieve and Hogg (in press, Expt 1), a reduction of certainty was not any stronger for the categorized, high uncertainty condition. Interestingly, identification did not mediate the effect of categorization on ingroup bias, contrary to expectations. Self-esteem was found to be higher for categorized than non-categorized participants, but no higher in the cell showing significant ingroup bias.

To summarize, Hogg and his colleagues (e.g., Abrams & Hogg, 1993; Hogg, in press) have argued that uncertainty reduction is the prime function of groups, and that this goal is realized through identification with the ingroup. As a result of depersonalization (i.e., becoming an interchangeable unit with other ingroup members) and subsequent strong positive feelings toward the ingroup, intergroup behaviour results, where group members act in favour of the ingroup. Support for this model is mixed. One finding is abundantly clear – ingroup bias is most often found under conditions of high uncertainty (Grieve & Hogg, in press, Expts 1 & 2; Hogg & Grieve, in press; Mullin & Hogg, 1998; but see also Tajfel & Billig, 1974). Despite this fairly consistent finding, however, the mechanisms underlying ingroup favouritism using the Tajfel matrices are far from clear. Two key findings are problematic for the self-categorization perspective. First, although categorization under conditions of uncertainty is accompanied by an increase of identification in some studies (Grieve & Hogg, in press, Expts 1 & 2; Mullin & Hogg, 1998) it was not in others (Hogg & Grieve, in press) and failed to mediate the process in one study testing for this effect (Mullin & Hogg, 1998). Second, under these same conditions, a reduction of reported uncertainty was found in only one study (Hogg

& Grieve, in press) and not in others (Grieve & Hogg, in press, Expt 1; Mullin & Hogg, 1998).¹⁰ The role of self-esteem is also unclear, considering that Hogg and Grieve (in press) found that ingroup bias was accompanied by increased self-esteem, while other studies did not support this finding (Grieve & Hogg, in press, Expts 1 & 2; Mullin & Hogg, 1998). Overall, self-categorization theory has the impressive ability to predict minimal intergroup behaviour, but the mechanisms responsible for such behaviour are still open to question. An examination of individual differences in the resolution of uncertainty is expected to help shed light on the categorization process.

Social Identification, Uncertainty, and Uncertainty Orientation

Both social identity theory and self-categorization theory have a great deal to say about how individuals categorize themselves at the social level, and the consequences of this process for group behaviour. Hogg and Abrams (1993) have recently argued that groups are formed for the purpose of reducing uncertainty. This is not a novel idea. Researchers have long suggested that social comparison serves an important function in social life (Festinger 1954; Hardin & Higgins, 1996; Moscovici, 1976; Tesser, 1986). However, the role of categorization processes in terms of resource allocation has not been adequately explored. Moreover, an analysis of personality is generally absent in the social identity literature.

Social identity and self-categorization theorists seem, for the most part, to be reluctant to consider the role of individual differences in categorization processes. Abrams and Hogg (1990) state that although personality differences such as the need for cognition and uncertainty orientation offer interesting insights, these personality

¹⁰ Grieve and Hogg (in press, Expt 2) did not include a measure of certainty.

approaches “obscure the context in which persuasive attempts occur and the motivations which may arise in different situations” (p.200). Hogg (in press, [p.6]) warns that “personality and individual difference conceptualizations of uncertainty should be treated cautiously” and that “if predispositions have a role to play it is a relatively minor role, and it is tightly constrained by social context.”

Such ideology is both unfair and misguided. Personality differences such as uncertainty orientation do not obscure the personality and situational influences of uncertainty, but rather they address the complex person by situation interactions that influence behaviour. More to the point, simply because uncertainty can be created by social or situational factors does not mean that it is nonsensical to examine how people differ in their reactions to such uncertainty.

For instance, Huber et al. (1992) provided an early test of the uncertainty orientation dimension in a group setting. Students at different levels of education and across different cultures were given the opportunity to learn in either a cooperative setting (open group discussion) or a traditional learning setting (very structured). The authors expected that UOs would appreciate and be motivated by conditions that allowed them to learn via self-discovery, as would be facilitated by the cooperative learning strategy. They expected that the COs would not be motivated under these conditions, and would rather prefer the structure offered by the more traditional class dynamics. The results of the study revealed that all individuals preferred cooperative to traditional learning styles, but that this was more the case for UOs than COs. Moreover, UOs performed better under the discovery method than traditional methods. COs were more negative toward this style of group dynamic, and demonstrated worse performance

under these conditions. In the words of the authors, COs “would rather have a teacher tell them what is right or wrong than find out for themselves” (Huber et al., 1992, p.5). Thus, uncertainty in group settings is best resolved for the CO group member by relying on a structured situation or an expert source. This finding was paralleled by Sorrentino et al. (1988), who found that COs showed increased reliance on expert source cues under conditions of high than low personal relevance. Rather than using the group setting as a vehicle for learning, therefore, it is possible that COs will use group categories as judgement shortcuts, this facilitating heuristic processing.

In a test of the groupthink model, Hodson and Sorrentino (1997) examined how uncertainty orientation influenced group decision-making. Janis (1982) had previously speculated that high group cohesion and closed (i.e., directive) leadership style would likely lead to poor decision-making, reflected in symptoms of groupthink (e.g., self-censorship, perceived unanimity of decision) and symptoms of defective decision-making (e.g., failure to consider risk and objectives). Hodson and Sorrentino assembled 68 groups of COs and UOs to work on a legal task. Participants were randomly assigned to a low or high cohesion condition and to a closed (or directive) or open (or non-directive) leadership condition. Leaders in the closed and open leader conditions were instructed to state their opinions to the group at an early or late point, respectively. The scenario was arranged so that it was possible to examine the amount of biasing influence the leader could contribute to the discussion, and how cohesion conditions could influence group-based motivation to consider information relevant to the task.

As predicted, Hodson and Sorrentino (1997) found that CO groups were more likely to reach biased decisions with closed than open leaders, whereas UO groups were

unaffected by leadership style. Closed leadership style also influenced CO (but not UO) groups by motivating them to exert more pressure on dissenters. CO groups were affected significantly by the cohesion manipulations, shown by an increased consideration of the task details under high than low cohesion conditions. Interestingly, COs did not make less biased decisions under these high cohesion conditions; leadership style alone determined the extent of decision biasing. A significant pattern of interaction revealed that while COs considered more case facts (suggesting motivated information processing) in the high cohesion (high certainty) conditions, UOs did the opposite, considering more facts in the low cohesion (high uncertainty) conditions. The results provide support for personality-based differences in how people deal with uncertainty in group situations. Overall, it would appear that COs are more susceptible to group biases than are UOs, at least in terms of group decision-making. The question at this point is whether these differences translate to differences in social identification.

Brewer and Harasty (1996) suggest that the CO individual should be more likely to view the ingroup category as high in entitativity. That is, COs should be more likely than UOs to derive a sense of homogenous "groupness" (and consequently, certainty) from a group category (see also Roney & Sorrentino, 1987). In support of Brewer and Harasty's suggestion, CO groups in the Hodson and Sorrentino (1997) groupthink study were less likely to issue statements of disagreement when interacting as a group. In addition, they turned to leaders for guidance when making decisions in groups. Considering that leaders are often perceived as prototypes for social categories (see Fielding & Hogg, 1997), it stands to reason that COs should be more likely than UOs to

“turn to” an ingroup category when faced with a situation demanding the resolution of uncertainty.

Study 2 - Rationale and Hypotheses

The purpose of the proposed study is twofold. First, it is necessary to address the motivational role of uncertainty reduction in groups. As noted in the literature review, ingroup bias in minimal group conditions is strengthened under conditions of high uncertainty. However, the mixed results concerning the role of identification, uncertainty reduction, and self-esteem leave the underlying mechanisms relatively unknown. Given the limited testing of the hypothesis, and the conflicting findings, additional testing of the hypothesis is necessary. Second, the role of personality differences in the categorization process remains relatively untested (but see Perreault & Bourhis, 1999). The dimension of uncertainty orientation should prove directly relevant to the question of how group identity reduces uncertainty in groups, which will in turn help to address the first issue.

In accordance with the predictions by Tajfel and Billig (1974), and the results of Grieve and Hogg (in press, Expts 1 & 2), Hogg and Grieve (in press), and Mullin and Hogg (1998), it is predicted that more ingroup bias will be found for participants who are explicitly categorized (i.e., assigned to salient groups) than when uncategorized (i.e., unassigned to groups). This difference based on categorization should be greater under conditions of uncertainty than under conditions of certainty.

These predictions are expected, however, to be more true for the CO than UO person. Presumably the CO is the type of person that Hogg (1996a, p.74) had in mind when he stated that “people seek subjective certainty.” Therefore, the predicted pattern

for COs should be greater than the same pattern for the UO personality type. In short, COs are expected to show more ingroup bias (i.e., favouritism) when they are categorized under conditions of uncertainty than certainty. When faced with uncertainty, COs should use the group as a heuristic to reduce the uncertainty (see arguments for Study 1), acting in a similar manner to the participants tested by Hogg and colleagues. Such reliance on a heuristic should be reduced when uncertainty is lower. UOs are not expected to show ingroup bias under these minimal group conditions, as the group can only serve a heuristic value in this paradigm and should prove of little interest to these group members.

Method

Participants

Those participants who completed Study 1 were also used in Study 2 (a substantially different experiment with little procedural similarity). As mentioned previously, assignment to the experimental conditions in Study 1 did not influence the outcome of Study 2. Of the 223 participants who returned to complete the experimental phase of Study 2, two were omitted from analyses due to suspicion (both COs), leaving a total of 72 COs, 75 UOs, and 74 moderates. Due to the fact that moderates are not typically employed in statistical analyses for both theoretical and empirical reasons (see Sorrentino & Short, 1977), 147 participants (38 men, 109 women) were used in the principal analyses.

Phase I: Mass-Testing

In Phase I, participants were mass-tested for their uncertainty orientation (see instructions from Study 1, Phase I).

Phase II: Experimental Design

The design of the study was a 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Uncertainty: low vs high) between participants design. Two different types of uncertainty were analyzed, one involving uncertainty about the experimental task (Task Uncertainty), and the other concerned with the number of previous experiments completed by participants (Situational Uncertainty). For reasons that will soon become apparent, this report focuses on Task Uncertainty. The procedure was similar to that of Mullin and Hogg (1998), except where noted. Participants returned individually for the second session, yet two were run simultaneously

in adjacent rooms. Uncertainty orientation and situational uncertainty (operationalized as the amount of past experience in psychology studies) were participant factors.

Individuals were randomly assigned to either a salient categorization condition or not, and also to a low or high task uncertainty condition.

Phase II: Experimental Session

All materials employed and instructions given in this study can be found in Appendix B. Participants arrived and were seated at a desk. They were informed that the experimenter was investigating decision-making and social judgements. Participants were told that they were each receiving their own identification number, but in fact they all received the same identification number (i.e., #34) on the pamphlet. The nature and general procedure of the point allocation matrices (i.e., the Tajfel matrices) were explained to them at this point (see Appendix B for instructions). In short, they were informed that they would be assigning points to individuals; categorized participants were also informed that these individuals would belong to different groups (Y vs Z). A sample matrix was completed by all participants to ensure that they understood the basic instructions. This matrix had a different pattern of distribution boxes than any of the matrices provided in the subsequent task, so that performance on the matrix would allow them to learn the general (but not specific) procedure of the task.

Task Uncertainty Manipulation. In short, those in the low uncertainty condition were given detailed instructions and practice on the matrix task, whereas those in the high uncertainty condition completed a filler task. In the low uncertainty condition, an opportunity was given for participants to complete up to six matrices similar to the upcoming task. They were told that the matrices were all different and that there were

different combinations of point recipients on different pages of the matrices, and that they could choose to allocate: (a) equal numbers of points to each person; (b) more points to one participant than the other; or (c) the maximum number of points, regardless of who gets more. These low uncertainty participants were also informed that point distribution choices were entirely up to the participants, and it was stressed that there are no correct or incorrect strategies. According to Mullin and Hogg (1998), these instructions decrease uncertainty before the categorization manipulation is to be instituted.

In the high uncertainty condition, a filler task (an alphabetizing chore) was used instead of completing the practice matrices. In addition, these participants were *not* informed that the choices had no correct or incorrect answers. The lack of detailed instruction and practice on the upcoming matrix task was intended to introduce more relative uncertainty for these participants compared to those in the low uncertainty condition (Mullin & Hogg, 1998).

After the task uncertainty manipulation, participants completed a questionnaire assessing self-reported levels of uncertainty (see Appendix B). Using 9-point rating scales, the questionnaire asked participants to indicate their degree of certainty or uncertainty. This measure was administered again after the main dependent measures (i.e., responses to the Tajfel matrices) were collected. The “baseline” measure of uncertainty used by Mullin and Hogg (1998) was dropped due to a concern that participants would be both suspicious and bored from repeated exposure to the same measure.

Categorization Manipulation. After the task uncertainty manipulation came the categorization (i.e., identification) manipulation. Those in the categorization condition

were informed that they were explicitly assigned to be members of Group Y or Group Z. In reality, all of these participants were assigned to Group Z. This information was written on the cover of their booklets, and they were explicitly asked to remember their group assignment, as it would be important at a later point in the experiment.

Uncategorized participants simply kept their original identification number (#34) and no mention of groups was made. These participants allocated points to individuals with identification code numbers that were distanced from 34. Although categorized participants were to award points to individuals with the same identification numbers as the uncategorized participants, these identification numbers were also linked to the group label Y or Z. In other words, the only difference between the conditions was the attachment of group category labels (Y vs Z) to the materials for categorized participants.

“Tajfel Matrices”. After completion of the abovementioned experimental manipulations, participants were given a series of payment matrices (known as "Tajfel matrices"). These matrices provided measures of Ingroup Bias (or ingroup favouritism). The object of these matrices is to assign points to specific individuals; those in the categorization condition also saw that these individuals are associated with specific groups. Therefore, for those participants in the categorized conditions, payments were made to specific members belonging to either the ingroup or the outgroup.

The use of the Tajfel Matrices is based on recommendations stipulated by Bourhis et al. (1994). Each matrix consisted of 13 boxes (or columns), with each box containing two numbers. One of these numbers referred to the number of points awarded to a specific individual and the other number refers to the number of points awarded to another member. Participants were instructed to place a check mark above the box that

reflected the number of points that they wished to award. In addition, they were asked to write (in the space provided) the number of points that they had awarded to each member. On each page there was one matrix, with a total of 12 pages. The order of the pages were randomly sorted across participants. See Appendix B for a sample of the matrices.

The Tajfel matrices provide data relevant to several allocation strategies. Parity (P), or fairness, is a strategy whereby an individual awards an equal number of points to both the ingroup and outgroup member. The Maximum Joint Profit (MJP) strategy reflects a choice to award a high number of points to both members. This represents “an economically rational strategy, because it maximizes the number of points obtained for all subjects in the experiment” (Bourhis et al., 1994, p.211). The Maximum Ingroup Profit (MIP) strategy is selected by a participant who wishes to allocate a high number of points to the ingroup member irrespective of the coinciding reward to the outgroup member. The strategy known as Maximum Differentiation (MD) is characterized by a participant who is concerned with creating the greatest differential possible between the ingroup and outgroup member, with the aim to favour the ingroup. This strategy compromises the MIP, but creates a large differential between the two groups. For example, the choice to allocate 7 points to the ingroup and only 1 to the outgroup maximizes the difference between the ingroup and outgroup (thus showing severe favouritism), even though a participant might have chosen to award higher numbers (e.g., 19 and 25, respectively) to those members to ensure that all recipients receive a large number of points overall. This strategy is not considered to be economically rational (see Bourhis et al., 1994), because the participant chooses to veer away from awarding a high number of points to the ingroup because he or she wishes to maximize the points-ratio

between the ingroup and outgroup. Ingroup Favouritism (FAV) refers to a strategy whereby a participant employs both the maximum ingroup profit and maximum differentiation allocation strategies. This is represented as $FAV = MIP + MD$. Outgroup favouritism is characterized by an individual who consistently provides negative FAV or MD scores.

Three matrix types were presented to participants. Matrix Type A contrasts the FAV (i.e., $MIP + MD$) with MJP, while Type B contrasts MD with $MIP + MJP$, and Type C contrasts P with FAV (Bourhis et al., 1994). For each type of matrix, the strategies are presented as being opposed or together, with the ingroup recipient always being located on the top of the matrix. For example (taken from Bourhis et al., 1994, p.212), in the Type A Opposed condition, the values of 19/1 are at the left end of the matrix, with 7/25 at the other. Therefore, the 7/25 option maximizes the joint (or total) profit for the recipients (as $7 + 25$ equals 32), whereas the 19/1 option gives the most points to the ingroup at the cost of considerable points to the joint profit. Note, however, that in the Together version of the same matrix, the columns in the matrix are inversed and in the opposite order. In this case, *both* FAV and MJP are located at the same location on the column (here, the far left column, 25/7). Hence selection of this column would show the most ingroup favouritism and at the same time maximize the total points given to recipients. The same reversals for the Opposed and Together versions of the matrices is true for the B and C matrix types, allowing for the researcher to compare a variety of allocation strategies. "Pull scores" (discussed later) can be calculated to measure the degree of ingroup bias. See Bourhis et al. (1994) for more detail.

Post-Experimental Questionnaire. After completing the Tajfel matrices, participants answered a questionnaire (see Appendix B). In this booklet, the uncertainty index was administered for a second time. Five additional items (using 9-point rating scales) determined ingroup identification. These items assessed: (a) liking of ingroup members (or, for uncategorized participants, members with similar code numbers); (b) similarity of self with these people; (c) desire to get acquainted with these people; (d) feelings of belongingness with their ingroup; and (e) preferences for belonging to ingroup vs outgroup. These items were later aggregated into a composite identification index based on Mullin and Hogg (1998).

Considering that Mullin and Hogg (1998) examined social awareness and self-esteem, these measures were also included in the present study. Specifically, participants rated the extent to which they were: (a) aware that others were present; (b) observed by others present; (c) observed by the experimenter. Similar to Mullin and Hogg, the self-esteem measure assessed transitory personal-level self-esteem, asking “how favourable is your impression of yourself right now?” In addition, participants reported the number of psychology experiments completed during the last 6 months and during their lifetime, and whether they had taken part in studies asking them to allocate points to other individuals. Participants were then probed for suspicion, debriefed, and thanked for their participation (see Appendix B for debriefing and consent forms).

Summary of Experimental Procedure for Phase II (Study 2). Participants were assigned their own “unique” identification number (#34). A brief description of the Tajfel matrices was given to all participants, followed by one sample matrix. Task Uncertainty was then manipulated, whereby participants received either detailed

instructions (including the instructions that there were no correct or incorrect answers) and six practice matrices (low Task Uncertainty condition) or worked on a filler task (high Task Uncertainty). This was followed by the self-report uncertainty questionnaire. Next, Categorization was manipulated. Participants were either: (a) randomly assigned to Group Z (with personal identification #34), as opposed to Group Y; or (b) left with their personal identification number, with no mention being made of Groups Y or Z. The Tajfel matrices were then completed, followed by the post-experimental measures.

Results

Manipulation Checks

Task Uncertainty Manipulation. A measure of reported certainty (5 items, 9-point rating scales, $\alpha = .81$) was collected before and after the Tajfel matrix task completion. The first rating of certainty is of interest as a manipulation check. A 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) ANOVA was performed with an average of uncertainty items at Time 1 as a dependent measure. Supporting the experimental manipulation, a significant main effect indicated that those participants in the high uncertainty condition ($M=6.64$, $SD=1.33$) reported more uncertainty than did those in the low uncertainty condition ($M=6.01$, $SD=1.20$), $F(1,139) = 9.76$, $p < .002$. No other significant main effects or interactions were found.

Categorization Manipulation. To determine the effectiveness of the Categorization manipulation, participants were asked to indicate (5 items, 9-point rating scales, $\alpha = .72$) the extent to which they identified with their group (for categorized participants) or with other participants with identification numbers in the 30s (for uncategorized participants). A 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) ANOVA was performed with an average of the identification measures as the dependent variable. A significant main effect reveals that categorized participants ($M= 5.72$, $SD=1.33$) identified more strongly with their group than did uncategorized participants ($M=4.91$, $SD=1.14$), $F(1,141) = 16.10$, $p < .001$, supporting the manipulation. No other significant main effects or interactions were found.

Ingroup Bias

The key variable of interest to the present study is the extent to which participants demonstrate favouritism toward the ingroup (i.e., “ingroup bias”). This variable represents an aggregation of the three discriminatory strategies that can be used by participants (i.e., FAV on MJP; MD on MIP+MJP; FAV on P) via the Tajfel matrices, as used by Mullin and Hogg (1998).

Task Uncertainty. The 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) pattern of interaction was tested employing a between-participants ANOVA with Ingroup Bias as the dependent measure. None of the effects reached conventional levels of significance (see Table 2-1 for the ANOVA summary). However, as demonstrated in Figure 2-1, a very interesting pattern emerged, and this pattern is entirely consistent with predictions. Analyses in subsequent sections will reveal the importance of this pattern.

As can be seen in Figure 2-1, the strongest evidence of Ingroup Bias is found in one specific cell – *when COs are categorized under high task uncertainty*. As reflected in the omnibus F-test, an a priori t-test of the predicted pattern of interaction (Winer, 1971) testing that the difference between categorized vs uncategorized participants is strongest under high (vs low) task uncertainty, with this difference being greater for COs than for UOs, was not significant, $t(139) = 1.25$, ns. Specifically, this test investigates whether CO participants under high uncertainty showed more ingroup bias if categorized ($M = 10.93$, $SD = 20.39$) than uncategorized ($M = -.38$, $SD = 8.73$), and whether this difference was greater than the same difference for low uncertainty ($M = 2.95$, $SD = 28.30$ vs $M = 4.24$, $SD = 15.24$), and whether this overall CO pattern was greater than the UO

Table 2-1

Analysis of Variance summary for 3-way interaction of Uncertainty Orientation (U.O.),
Categorization (Catn), and Task Uncertainty (Task-U.) on Ingroup Bias.

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	76.27	.22	.637
Catn	1	273.52	.80	.372
Task-U.	1	498.49	1.46	.229
<u>2-Way Interactions</u>				
U.O. X Catn	1	183.48	.54	.465
U.O. X Task-U.	1	149.07	.44	.510
Catn X Task-U.	1	219.60	.64	.424
<u>3-Way Interaction</u>				
U.O. X Catn X Task-U.	1	531.70	1.56	.214

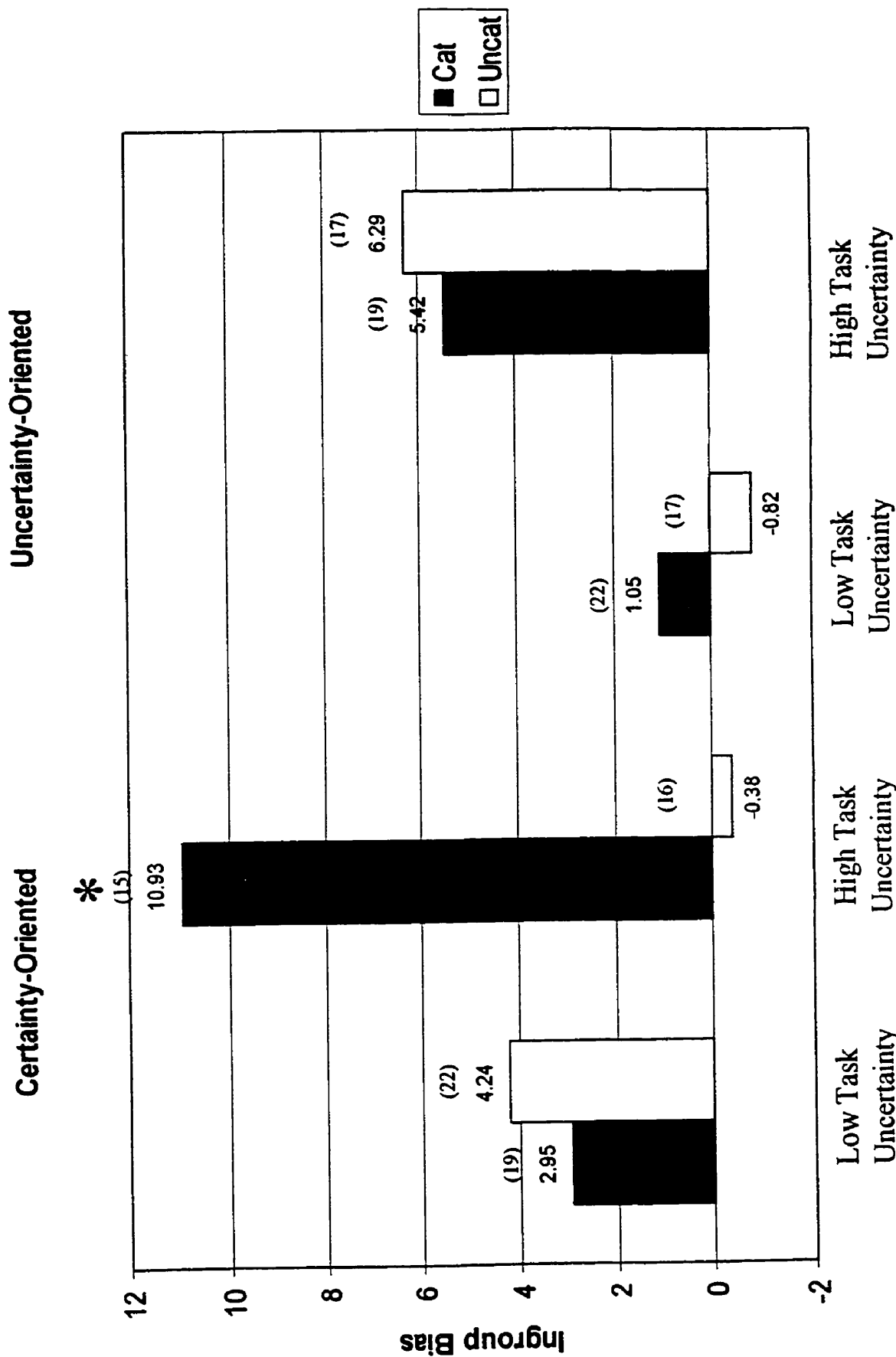


Figure 1. Ingroup Bias as a function of Uncertainty Orientation, Categorization, and Task Uncertainty. Cat=Categorized, Uncat=Uncategorized. Cell sizes in parentheses.

* cell differs from zero $p < .05$.

pattern (high uncertainty, $M=5.42$, $SD=23.01$ vs $M=6.29$, $SD=16.21$; low uncertainty, $M=1.05$, $SD=9.39$ vs $M=-.82$, $SD=18.58$).

Consistent with predictions, however, COs under high Task Uncertainty conditions were the only participants shown in Figure 2-1 to demonstrate a significant difference in Ingroup Bias between the categorized ($M=10.93$) and uncategorized ($M=-0.38$) conditions, $t(139) = 1.70$, $p < .05$ (one-tailed). Actually, the only one of the eight experimental cells with a mean significantly different than zero (showing evidence of a consistent pattern of discriminatory response) was the CO-Categorized-High Task Uncertainty cell, $t(14) = 2.08$, $p < .025$ (one-tailed). As predicted, therefore, the strongest evidence of Ingroup Bias was found for CO participants who were categorized as group members and found themselves in a situation of high task uncertainty.

A weighted contrast between the key cell of interest (COs under high uncertainty, categorized vs uncategorized) and the remaining three cells (all categorized vs uncategorized) was performed. The former contrast was given a weight of +3, with the other three contrasts being given weights of -1, -1, -1. A marginally significant difference was found between the CO-high uncertainty cell ingroup bias differential (i.e., categorized vs uncategorized) and the differential contrasts in the other three cells, $t(139)=1.61$, $p < .10$.

Situational Uncertainty. This measure was a self-report account of the number of previous experiments completed by participants. A median split on the number of reported experiments split participants into categories of high (≤ 2) and low (> 2) situational uncertainty. Recall that Mullin and Hogg (1998) anticipated that participants completing a higher number of previous experiments should experience less uncertainty

about the testing situation than their counterparts. The predicted 3-way interaction of Uncertainty Orientation (CO vs UO) X Categorization (categorized vs uncategorized) X Situational Uncertainty (low vs high) was not statistically significant (see Table 2-2 for ANOVA summary). This variable did not provide any significant findings. Most of the subsequent analyses and discussions do not involve situational uncertainty as a variable.

Specific Discrimination Strategies (Pull Scores)

As mentioned previously, the Ingroup Bias analyses reported above reflect the overall extent to which participants allocated more points to their own group than to an outgroup. The subsequent analyses are more sensitive tests of *which* particular strategies are predominant for which people under different experimental conditions.

Turner (1978) suggests that differences in simple rank scores for the two versions of the same matrix (i.e., Opposed vs Together) be examined to determine allocation strategies. The benefit of this procedure is that it “enables subjects to be used as their own controls against their idiosyncratic, extraneous response biases” (Bourhis et al., 1994, p.215; see also Brown, Tajfel, & Turner, 1980; Turner, 1980). These difference scores are called “pull scores”, and are typically analyzed using the Wilcoxon Matched Pairs Test on the difference score. These scores test the competing influence of two different allocation strategies that are presented on each of the participant’s pages. These scores tend to be orthogonal, both theoretically and empirically (see Bourhis et al., 1994; Sachdev & Bourhis, 1985, 1987, 1991).

Two pull scores are computed for each of Type of matrix (A, B, and C), for a total of 6 types of pull scores. For example, for Matrix Type A, one computes the pull of FAV (MIP+MD) on MJP, and the pull of MJP on FAV (MIP+MD). The theoretical range on

Table 2-2

Analysis of Variance summary for 3-way interaction of Uncertainty Orientation (U.O.),
Categorization (Catn), and Situational Uncertainty (Sitn-U.) on Ingroup Bias.

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	63.73	.18	.671
Catn	1	217.96	.62	.432
Sitn-U.	1	43.73	.12	.725
<u>2-Way Interactions</u>				
U.O. X Catn	1	167.01	.48	.492
U.O. X Sitn-U.	1	401.41	1.14	.287
Catn X Sitn-U.	1	37.87	.11	.743
<u>3-Way Interaction</u>				
U.O. X Catn X Sitn-U.	1	34.53	.10	.754

the pull scores is typically -12 to $+12$, where negative scores on FAV and MD denote outgroup favouritism. In the present experiment these values range from -24 to $+24$, as two sets of each type of matrix were employed. That is, the experimenter used 2 forms of matrix types A, B, and C, each with its own Opposed and Together version. For greater details on Tajfel matrices in general, and pull scores in particular, the reader is referred to Bourhis et al. (1994), Brown et al. (1980), and Turner (1980).

Task Uncertainty. Table 2-3 shows the Uncertainty Orientation X Categorization X Task Uncertainty pattern of interaction as a function of specific pull scores related to particular resource allocation strategies. Employing Wilcoxon Matched Pairs tests, two features of these data become quickly apparent. First, the only evidence of discriminatory resource allocation strategies is found in one cell, that of categorized COs under high task uncertainty. Specifically, participants in this particular experimental cell consistently employed two of the three discriminatory strategies (i.e., FAV on P; FAV on MJP, $ps < .02$) when allocating resources. This finding mirrors the Ingroup Bias findings. No other discriminatory strategies were reliably selected by participants in any other cell.¹¹ The second finding of interest is that the P on FAV strategy was selected by all participants in all experimental conditions (all $ps < .05$). This is not surprising, and is a common finding with use of the Tajfel matrices (for e.g., see Allen & Wilder, 1975; Mullin & Hogg, 1998; Sachdev & Bourhis, 1987). That is, participants choose fair strategies, but some (here, COs categorized under high uncertainty) *also* choose discriminatory strategies.

¹¹ These six types of pull scores were also subjected to a multivariate analysis of variance (MANOVA), but no multivariate effects were significant, and only one univariate effect was significant (i.e., FAV_P Task-U. main effect, $p < .035$). This is not surprising, given that the only interesting effects were limited primarily to one experimental cell, and only for the discrimination measures.

Table 2-3.
 Mean "pulls" of distribution strategies selected as a function of Uncertainty Orientation, Categorization, and Task Uncertainty.

Strategies	Certainty-Oriented				Uncertainty-Oriented				
	Low Task Uncertainty		High Task Uncertainty		Low Task Uncertainty		High Task Uncertainty		
	Uncat	Cat	Uncat	Cat	Uncat	Cat	Uncat	Cat	
<i>Parity</i>									
P on FAV	8.77**	7.42**	11.43***	7.6**	7.53*	12.86***	8.47**	7.11*	
<i>Discrimination</i>									
FAV on P	.50	.37	.31	6.13‡	0	-.23	1.41	4.16	
FAV on MJP	2.29	1.16	1.31	4.67‡	-.35	.73	2.94	.79	
MD on									
MIP+MJP	1.45	1.42	-2.0	.13	-.47	.55	1.94	.47	
<i>Joint Profit</i>									
MIP+MJP on	1.00	1.00	-1.13	4.27	2.59	2.73	-.18	.05	
MD					.94	.27	-.35	1.00	
MJP on FAV	-1.98	-1.58	1.44	0					

Note: * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed); † $p < .02$ (one-tailed) on Wilcoxon Matched Pairs tests. Mean pull scores for each matrix ranges from -24 to +24. Uncat = Uncategorized, Cat = Categorized.

Situational Uncertainty. In a similar manner, the effects of the pull scores were examined within the Uncertainty Orientation X Categorization X Situational Uncertainty pattern of interaction, and these data are displayed in Table 2-4. Consistent with the ingroup bias measure, no reliable discrimination effects were found for any participants under any experimental conditions. Not surprisingly, significant P on FAV pulls were found in 7 out of 8 experimental cells ($p < .05$), similar to the Uncertainty Orientation X Categorization X Task Uncertainty pattern.

Group Identification

Upon completion of the experimental task, participants completed a measure tapping the extent to which participants identified with their group. As mentioned previously, the manipulation check successfully demonstrated that categorized participants more strongly identified with their groups than did uncategorized participants. According to self-categorization theory, however, categorization should result in ingroup bias to the extent that an individual identifies with his or her group (e.g., see Hogg & Mullin, 1999).

The Identification measure was subjected to a 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) between-participants ANOVA design presented in the manipulation check (see Table 2-5 for ANOVA summary). Specific a priori contrasts of means revealed that for COs, categorized participants reported higher levels of identification than did uncategorized participants, under conditions of both low task uncertainty ($M=5.99$, $SD=1.58$ vs $M=4.96$, $SD=1.09$, $t(137)=2.57$, $p < .05$) and high task uncertainty ($M=5.93$, $SD=1.24$ vs $M=4.59$, $SD=.87$, $t(137)=2.98$, $p < .05$). UOs did not show significant

Table 2-4.

Mean "pulls" of distribution strategies selected as a function of Uncertainty Orientation, Categorization, and Situational Uncertainty.

Strategies	Certainty-Oriented				Uncertainty-Oriented				
	Low Situation Uncertainty		High Situation Uncertainty		Low Situation Uncertainty		High Situation Uncertainty		
	Uncat	Cat	Uncat	Cat	Uncat	Cat	Uncat	Cat	
<i>Parity</i>									
P on FAV	13.93***	9.64**	8.00**	6.48**	10.20***	12.79***	4.86	8.20*	
<i>Discrimination</i>									
FAV on P	.36	3.45	-.17	2.65	-.70	.05	2.71	3.20	
FAV on MJP	2.93	3.82	1.10	2.17	1.95	-.21	.36	1.90	
MD on									
MIP+MJP	0	.73	0	.91	.45	.11	1.14	1.50	
<i>Joint Profit</i>									
MIP+MJP on	1.86	3.45	-.96	1.96	1.25	.32	1.14	2.90	
MD									
MJP on FAV	-.50	.36	-.81	-1.48	2.55	.53	-2.93*	.40	

Note: * $p < .05$, ** $p < .01$, *** $p < .001$ (two-tailed) on Wilcoxon Matched Pairs tests. Mean pull scores for each matrix ranges from -24 to +24. Uncat = Uncategorized, Cat = Categorized.

Table 2-5

Analysis of Variance summary for 3-way interaction of Uncertainty Orientation (U.O.),
Categorization (Catn), and Task Uncertainty (Task-U.) on Identification.

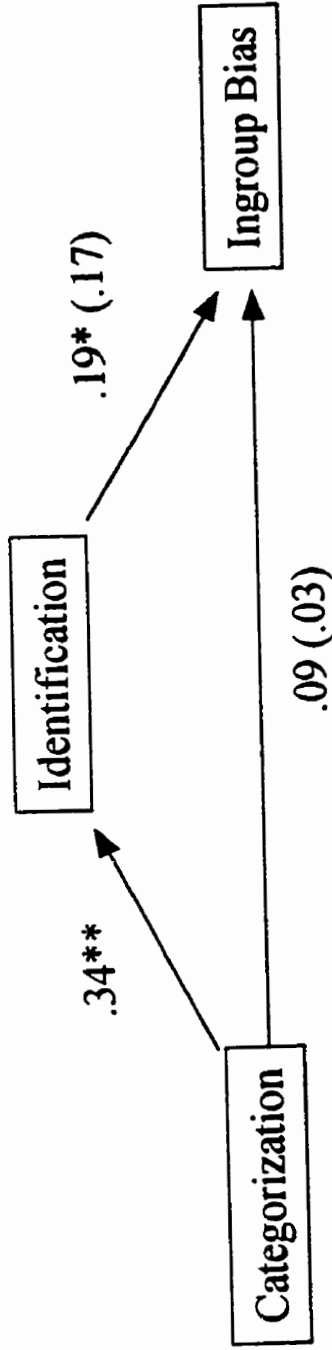
Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	.30	.19	.660
Catn	1	25.21	16.10	.000
Task-U.	1	.39	.25	.617
<u>2-Way Interactions</u>				
U.O. X Catn	1	4.33	2.76	.099
U.O. X Task-U.	1	.43	.27	.602
Catn X Task-U.	1	.65	.41	.522
<u>3-Way Interaction</u>				
U.O. X Catn X Task-U.	1	.02	.01	.910

differences in identification between categorized vs uncategorized conditions under low ($M = 5.46$, $SD=1.10$ vs $M=5.08$, $SD=1.17$) or high ($M= 5.57$, $SD=1.41$ vs $M=4.96$, $SD=1.09$) task uncertainty conditions, $t(137)= 0.94$, $t(137)=1.41$, respectively.

A series of mediation analyses were conducted to test the mediational role of Identification. This general model, collapsing across personality, is presented in the top panel of Figure 2-2. According to Baron & Kenny (1986), three conditions must be met to demonstrate successful mediation. In the present case, the following conditions should be met: (a) Categorization must be significantly related to both Identification and Ingroup Bias; (b) Identification must be significantly related to Ingroup Bias; and (c) the relationship between Categorization and Ingroup Bias must be dramatically reduced (while the relationship between Identification and Ingroup Bias remains relatively robust) when both Categorization and Identification are simultaneously used to predict Ingroup Bias. When interpreting these data, keep in mind that in these analyses Categorization is a categorical variable and the other two are continuous. As the top panel of Figure 2-2 demonstrates, there is no evidence for the mediational role of Identification under conditions of high Task Uncertainty (collapsing across personality). In fact, Categorization is not even significantly related to Ingroup Bias ($r=.09$, ns). This is also true under conditions of low task uncertainty.

However, additional analyses were conducted to test this model for both COs and UOs separately, under both low and high Task Uncertainty. Only those analyses involving CO participants under high task uncertainty revealed any significant effects. As depicted in the bottom panel of Figure 2-2, categorized COs did show higher levels of Identification ($r=.55$, $p<.001$) and higher levels of Ingroup Bias ($r=.35$, $p<.05$) than did

All Participants High Task Uncertainty



COs High Task Uncertainty

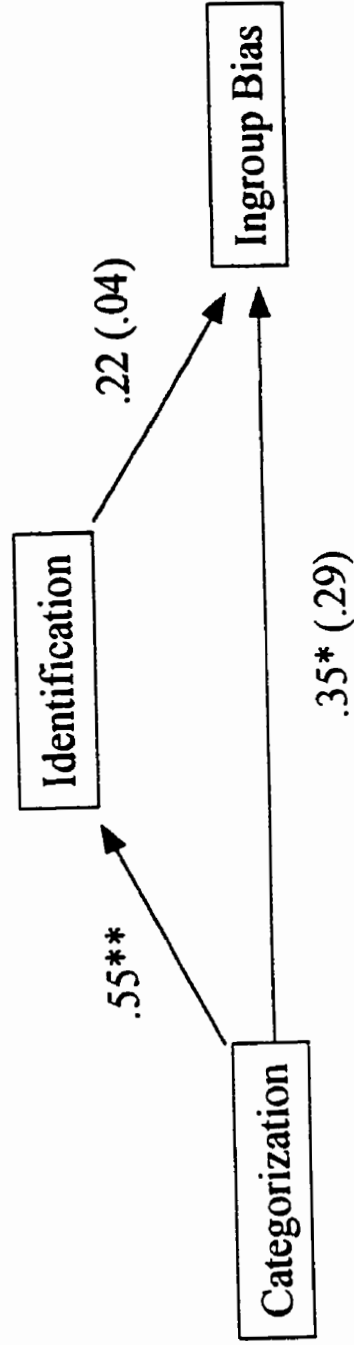


Figure 2-2. Mediation analyses of relations among Categorization, Identification, and Ingroup Bias. Pearson correlations are indicated on figure paths, with partial correlations (where applicable) in parentheses. * $p < .05$, ** $p < .001$.

uncategorized COs. However, the extent to which these participants identified with their group was not significantly related to the amount of bias they demonstrated, and consequently did not properly mediate the process. No other interesting effects were found for COs under low task uncertainty conditions, or UOs under any conditions.

Further analyses revealed some interesting findings. For instance, COs showed a significant correlation between Categorization and Identification under both low ($r=.37$, $p<.022$) and high ($r=.55$, $p<.001$) task uncertainty conditions, but only showed a significant correlation between Categorization and actual Ingroup Bias when the task was high in uncertainty ($r=.35$, $p<.05$). In brief, COs identified with their groups, regardless of task uncertainty, yet allocated more points to their own group only when the task was highly uncertain. UOs did not show significant correlations between Categorization and Identification under low ($r=.17$, ns) or high ($r=.22$, ns) task uncertainty, and no significant correlations were found between Categorization and Ingroup Bias under either of the task uncertainty conditions (both $r_s <.08$, ns).

In summary, therefore, Identification did not mediate the relationship of Categorization and Ingroup Bias overall. However, of particular interest to the principal findings, COs under high task uncertainty conditions did identify more strongly with their groups and did allocate more points to their own group than to another group. Despite this finding, an individual's level of identification was not directly related to their propensity to allocate more resources to their own group over an outgroup. UOs did not show any of these patterns of behaviour.

Change in Certainty Ratings

Ratings of subjective certainty were collected at two points (before and after the task was completed). A change in certainty measure was created by subtracting the averaged certainty rating at Time 1 from the averaged certainty rating at Time 2. Hence positive values indicate that participants felt more certain about aspects of their performance on the task. This Change in Certainty variable was subjected to a 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) between participants ANOVA (see Table 2-6, Appendix C for summary). A marginal main effect for Categorization revealed that uncategorized participants ($M=.69$, $SD=1.68$) tended to report greater change in certainty after completing the task than did categorized participants ($M=.24$, $SD=1.37$), $F(1,139)=3.49$, $p<.064$. A strong main effect of Task Uncertainty was found, whereby those in the high task uncertainty condition ($M=1.08$, $SD=1.81$) showed a much greater change in reported certainty than did those in the low task uncertainty condition ($M=-.06$, $SD=1.01$), $F(1, 139)=23.09$, $p<.001$. This is expected, as those in the low uncertainty conditions should experience less change in certainty because they were less uncertain in the first place. No significant higher-order interactions were found. Tests of a mediational model, where changes in certainty mediated the relationship between Categorization and Ingroup Bias, produced no reliable results.

“Awareness” of Others

Participants rated the extent to which they were aware of the presence of others, felt observed by others, and felt observed by the experimenter (9-point rating scales, $\alpha = .82$). Given the high degree of internal consistency among these items, they were

aggregated into a variable referred to as “Social Consciousness”, and subjected to a 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) between-participants ANOVA. A marginal main effect of Uncertainty Orientation shows that COs were marginally more conscious of others ($M=3.89$) than were UOs ($M=3.23$), $F(1,136) = 3.49$, $p<.064$. A significant 3-way interaction was found, $F(1,136) = 6.52$, $p<.012$ (see Table 2-7 for ANOVA summary). This pattern of interaction is represented in Figure 2-3. As seen in the Figure, COs are reporting the most Social Consciousness ($M=4.73$, $SD=1.53$) in the very cell under which they show the most Ingroup Bias (i.e., categorized COs under high uncertainty). UOs, on the other hand, show the opposite pattern, reporting the most Social Consciousness ($M=3.88$, $SD=2.58$) when the task is highly uncertain and they are uncategorized; their lowest value ($M=2.76$, $SD=1.91$) was found under the key cell of interest (categorized under high uncertainty).

These data suggest the possibility that Social Consciousness might be mediating the link between categorization and ingroup bias for COs. To test this possibility, a mediational model similar to the one in Figure 2-2 was tested, and is shown in Figure 2-4. Obviously the test for all participants failed because Categorization is not related to Ingroup Bias (see upper panel of Figure 2-4).

A rather compelling case for partial mediation, however, was found when examining COs under high task uncertainty. As can be seen from Figure 2-4, Categorization predicts both Social Consciousness ($r = .34$, $p<.058$) and Ingroup Bias ($r = .35$, $p <.05$), and Social Consciousness also predicts Ingroup Bias ($r = .36$, $p<.047$) for these participants. The link between Categorization and Ingroup Bias is considerably

Table 2-7

Analysis of Variance summary for 3-way interaction of Uncertainty Orientation (U.O.),
Categorization (Catn), and Task Uncertainty (Task-U.) on Social Consciousness

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	16.67	3.49	.064
Catn	1	.27	.06	.814
Task-U.	1	2.44	.51	.476
<u>2-Way Interactions</u>				
U.O. X Catn	1	2.87	.60	.439
U.O. X Task-U.	1	.17	.04	.850
Catn X Task-U.	1	.00	.00	.977
<u>3-Way Interaction</u>				
U.O. X Catn X Task-U.	1	31.11	6.52	.012

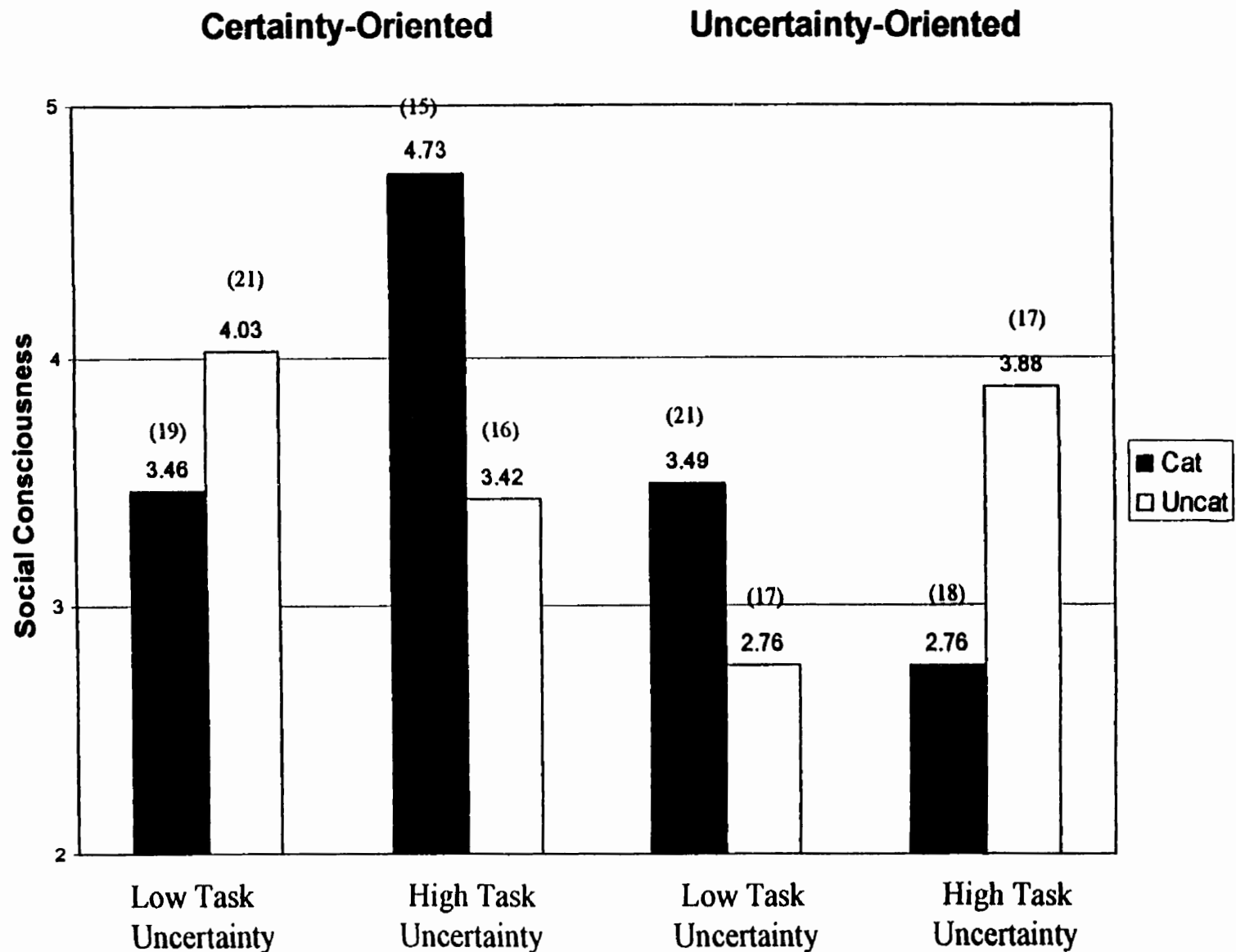
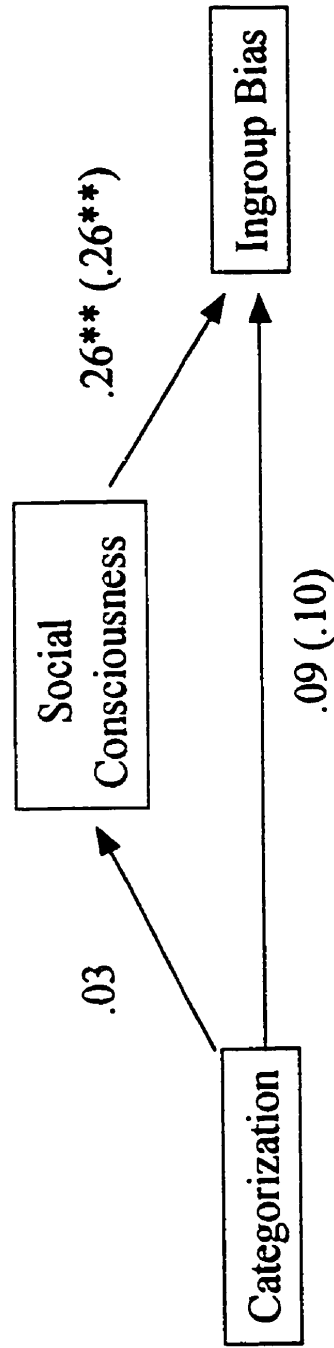


Figure 2-3. Social Consciousness as a function of Uncertainty Orientation, Categorization, and Task Uncertainty. Cat=Categorized, Uncat=Uncategorized. Cell sizes in parentheses.

All Participants High Task Uncertainty



COs High Task Uncertainty

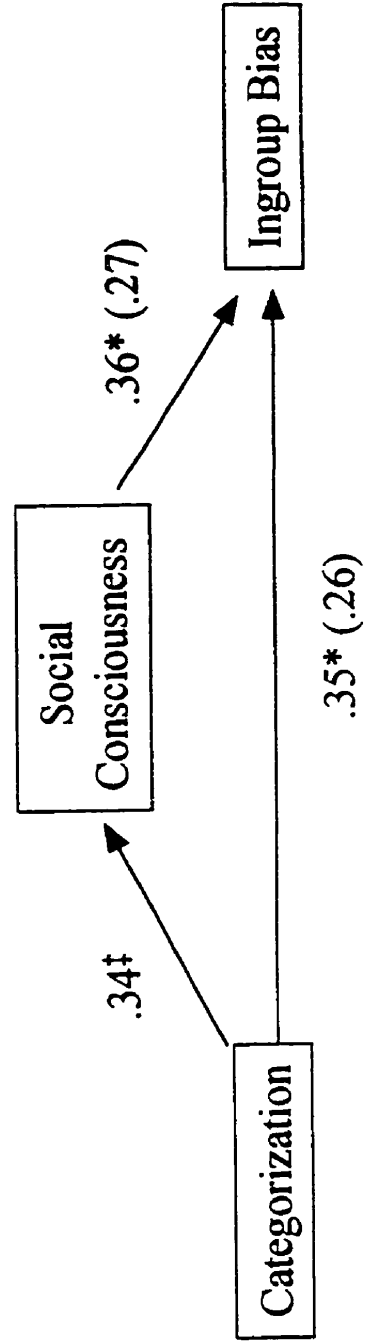


Figure 2-4. Meditational analyses of relations among Categorization, Social Consciousness, and Ingroup Bias. Pearson correlations are indicated on paths, with partial correlations (where applicable) in parentheses. * $p \leq .05$, ** $p < .01$, † $p < .058$.

weakened (i.e., partial $r = .26$, $p < .163$) with the inclusion of Social Consciousness (although this variable itself loses its predictive power in this final analysis, as its partial correlation was attenuated to $r = .27$, $p < .148$). These analyses suggest that Social Consciousness at least partially mediates the relationship between the Categorization and Ingroup bias for COs under high task uncertainty.¹² No other effects were found for COs under low task uncertainty conditions, or for UOs under either level of task uncertainty. The argument for a mediational role of Social Consciousness certainly seems stronger than that for Identification (compare Figure 2-4 with Figure 2-2). Of course, any interpretations based on these variables (i.e., dealing with awareness of others) will have to be speculative, as other people were not physically present during the experiment. On the other hand, each participant was aware that another participant was partaking in the experiment in the adjacent room.

Self-Esteem

Using a 9-point rating scale (1 = very unfavourable to 9 = very favourable), participants answered the item “How favourable is your impression of yourself right now?” This item was subjected to a 2 (Uncertainty Orientation: CO vs UO) X 2 (Categorization: categorized vs uncategorized) X 2 (Task Uncertainty: low vs high) between participants ANOVA (see Table 2-8, Appendix C for summary). As expected, a marginal main effect of Task Uncertainty indicated that those in the low task uncertainty condition ($M=6.95$, $SD=1.54$) reported marginally higher self-esteem than those in the high task uncertainty condition ($M=6.42$, $SD=1.95$), $F(1,136) = 3.46$, $p < .065$.

¹² Similar analyses using “observed by experimenter” as the mediator failed to show mediation. In fact, this variable was unrelated to ingroup bias ($r=.24$, $p<.201$), ruling out the possibility that such behaviour was due to demand characteristics.

Due to the fact that no contrasts were predicted for this variable, Tukey's HSD was used to examine all pairwise contrasts. None of these contrasts were statistically significant, $0 < q_s < 2.97$, ns. Although not significant, it is interesting to note that categorized COs show slightly *lower* self-esteem under high ($M=5.93$, $SD=2.40$) than low ($M=7.05$, $SD=1.18$) task uncertainty, $q=2.64$, ns.

Another interesting outcome was found. Recall that COs under high task uncertainty engaged in considerable ingroup favouritism, and that for these participants categorization was significantly correlated with ingroup identification. Interestingly, under these same conditions there was a positive correlation between Identification and Self-Esteem ($r = .42$, $p < .019$). For UOs under these conditions, this correlation was negative ($r = -.37$, $p < .027$), and they did not engage in consistent discrimination.

Additional Analyses

Breaking the resultant uncertainty orientation measure into its two components (\underline{n} Uncertainty, authoritarianism), it appears that the principal effects are driven more by the \underline{n} Uncertainty than authoritarianism component, but that the resultant measure better explains the data, as is usually the case (e.g., see Study 1). Examination of these components does, however, reveal some interesting findings. For group members (i.e., categorized participants) ingroup identification was correlated with authoritarianism ($r = .28$, $p < .004$) and with resultant uncertainty orientation ($r = -.20$, $p < .036$), but not with \underline{n} Uncertainty ($r = .01$, ns). Ingroup bias was not significantly correlated with authoritarianism ($r = .03$), \underline{n} Uncertainty ($r = -.05$), or resultant uncertainty orientation ($r = -.06$), but keep in mind that these analyses collapse across uncertainty conditions.¹³

¹³ These correlations include uncertainty orientation moderates.

Discussion

As predicted, only COs categorized under conditions of high task uncertainty showed evidence of ingroup bias ($p < .05$), operationalized in the present study as the use of resource allocation strategies favouring the ingroup (see Figure 2-1). Not surprisingly, UOs did not show this propensity for ingroup bias, consistent with the notion that COs are more biased by ingroups than UOs (Brewer & Harasty, 1996; Hodson & Sorrentino, 1997) and prone to think in black-and-white, categorical terms (Roney & Sorrentino, 1987). As predicted, however, group-oriented tendencies translated into actual ingroup bias only when the interaction of personality and situational determinants was considered. That is, COs showed more bias when faced with high than low uncertainty, and this pattern was greater for COs than UOs.

These findings are largely consistent with self-categorization theory's view that ingroup bias will be strengthened under conditions of high uncertainty (Hogg, in press; Hogg & Abrams, 1993; Hogg & Mullin, 1999), although the self-categorization approach minimizes the impact of individual differences in group behaviour. Such differences, the results of the present study attest, *are* important to understanding the role that groups serve in the reaction to uncertainty. Of particular interest to the present investigation is the finding that increased ingroup bias shown by COs categorized under high uncertainty was not accompanied by increased ingroup identification, certainty ratings, or self-esteem. These findings run counter to the *predictions* of social identity theory and self-categorization theory, but not necessarily to the findings in the research literature. In similar studies, increased ingroup bias under conditions of uncertainty was accompanied by: (a) an increase of identification in some studies (Grieve & Hogg, in press, Expts 1 &

2; Mullin & Hogg, 1998) but not in others (Hogg & Grieve, in press), and failed as a mediator in another (Mullin & Hogg, 1998); (b) reduction in reported uncertainty in one study (Hogg & Grieve, in press) and not in others (Grieve & Hogg, in press, Expt 1; Mullin & Hogg, 1998); (c) increased self-esteem in some cases (Hogg & Grieve, in press) but not others (Grieve & Hogg, in press, Expts 1 & 2; Mullin & Hogg, 1998). The fact that these variables were unrelated to ingroup bias in the present study is interesting, and warrants further discussion.

The role of ingroup identification in intergroup behaviour is crucial to the tenets of social identity and self-categorization theories. Hogg and Mullin (1999, p.258) clearly state that “the core idea of [their] model is that people identify with groups to reduce uncertainty.” This assertion was not supported in the present study, nor in some of their own studies listed in the literature review, proving a serious concern to these models. This problem has been noted before. For instance, Hinkle and Brown’s (1990) review of 14 ingroup bias studies, where bias was operationalized as positive evaluations of ingroups over outgroups, found no link between identification and ingroup bias (but see also Perreault & Bourhis, 1999 for criticisms of their approach).

In support of the position that groups serve different purposes for the different personality types, COs showed significantly higher levels of identification when categorized than uncategorized, and this finding was independent of task uncertainty levels. Despite elevated levels of identification in categorized COs, however, no significant relationship was found between identification and ingroup bias under high uncertainty (see Figure 2-2). In short, although COs identified with their groups

generally, this did not itself translate into increased favouritism, contrary to prediction by social identity and self-categorization theories.

The fact that reported levels of uncertainty were not reduced after demonstration of ingroup bias by categorized COs under high uncertainty is also troublesome to the model presented by Hogg & Abrams (1993), as is (to a lesser extent) the absence of elevated self-esteem under these conditions. The social consciousness variable may be more promising in terms of explaining the findings. Not only did categorized COs under high uncertainty report the highest levels of social consciousness, but UOs under these conditions showed very little evidence of this tendency, possibly because they were self-absorbed in an effort to figure out this somewhat confusing task. Thus the categorization process may have induced relatively uncertain COs to become more socially aware, and this was related to increased ingroup bias (see Figure 2-4). Not only was social consciousness directly related to ingroup bias ($r=.36$, $p<.05$), but it maintained a moderate (though not statistically significant) relationship after removal of the variance contributed by categorization ($r=.27$). When compared with Figure 2-2, it is evident that social consciousness is a stronger mediator of the categorization-bias link than is identification. These effects were not due to demand characteristics inherent in the task (see Footnote 12), but rather due to a heightened sense of others.

Taken together, these findings have implications for the role of social categories in judgement making, a theme common to both studies presented in this dissertation. The findings of the present study suggest that, at least for COs, ingroup categories were used as a heuristic for the completion of the resource allocation task. That is, a simple “*look out for your own*” judgement rule appears to have been employed by COs categorized

under high task uncertainty conditions. The analyses suggest that, for these individuals, categorization served to increase both social consciousness and ingroup identification, but only the former was significantly related to ingroup bias. These results imply partial mediation by social consciousness. Being conscious of others most likely increased the salience of the ingroup heuristic (or norm), increasing the degree of ingroup favouritism. This is consistent with Tajfel's (1969; Tajfel & Billig, 1974) assertion that there is a norm for ingroup favouritism. Thus, CO participants under high uncertainty conditions allocated more points to their ingroup over an outgroup because of a heightened sense of social awareness rather than a close attachment or identification with their ingroup.

This interpretation is consistent with the finding that, when discriminating in favour of the ingroup, these COs used only two of the three discriminatory strategies possible (i.e., FAV on P; FAV on MJP, see Table 2-3). The third discriminatory strategy (MD on MIP+MJP) is particularly vindictive because it involves a compromise in points allocated to the ingroup in order to most substantially differentiate between the ingroup and outgroup in favour of the ingroup, reflecting strong favouritism toward the ingroup (Bourhis et al., 1994). Although this strategy costs the ingroup an absolute number of points, it discriminates severely against the outgroup in a relative sense. Given that discriminating COs avoided use of this strategy suggests that they were not strongly invested in their groups, as social identity and self-categorization theories would suggest, but rather that they were using their ingroup category as a useful heuristic in determining an appropriate course of action. This interpretation is consistent with a study by Perreault and Bourhis (1999), where the MD on MIP+MJP strategy was only employed by

participants who had choice in entering their group and not by those who were randomly assigned to group categories.

Categorized COs under high uncertainty appear to have simply used an ingroup heuristic (e.g., “*look out for your own*”), awarding more points to their own group than an outgroup because they were uncertain of the appropriate procedure. This was accompanied by moderate forms of discrimination, as opposed to extreme bias (MD on MIP+MJP). No link was found between ingroup identification and ingroup bias, and participants did not feel better about their selves for having engaged in such behaviour. If anything, these COs showed a non-significant tendency to have lower self-esteem in this condition. Thus, for COs the ingroup was favoured not so much because it was regarded as an integral part of the self-concept *per se*, but rather because when faced with uncertainty COs typically increase their use of heuristics (see Sorrentino et al., 1988, Expts 1 & 2). Finding themselves in a situation where they did not know what to do, they adopted a strategy favouring their ingroup. Grieve and Hogg (in press, Expt 1) found ingroup bias without a change in reported certainty and concluded that a social heuristic may have been employed by participants. They argue that this is still a type of uncertainty reduction, nonetheless. This very well may be the case, particularly to the extent that a participant is certainty-oriented.

In the present study, the source of the uncertainty was not related to groups or social identity (as opposed to Study 1). Rather, it centred on uncertainty about how to behave (i.e., how to distribute resources on the Tajfel matrices). It is possible that a heuristic was used in order to accomplish the goal of task completion (i.e., the matrices)

rather than the goal of reducing uncertainty *per se*, particularly given that reported certainty levels did not change. Such speculation could be pursued in future research.

The Role of Personality in Minimal Group Paradigms

To reiterate the main findings, only COs categorized under high uncertainty showed significant ingroup bias, although this was not accompanied by increased identification, certainty, or self-esteem. Rather, increased social consciousness under these conditions may have been responsible for this finding. The importance of personality variables is evident. This perspective contradicts the self-categorization notion that

social contextual factors influence uncertainty, the resolution of uncertainty, and the way in which such resolution is expressed. If predispositions have a role to play it is a relatively minor role, and it is strongly constrained by social context (Hogg & Mullin, 1999, p.257-258 [emphasis added]).

While it may be true that situational factors play the stronger role in the origins of uncertainty, the resolution of uncertainty (and its expression) appear to be heavily constrained by personality influences. While uncertainty itself may depend on the situation, reactions to it can depend on one's personality, and specifically, how one's personality interacts with the situation. In the case of the present study, COs not only showed stronger evidence of ingroup bias under expected conditions, but they were the only people to show such behaviour, challenging the social identity and self-categorization perspectives that personality differences are minimal and inconsequential. Rather, certain aspects of these theories may be more relevant to certain personality types than others, where personality by situation interactions should be considered.

Other researchers have argued that personality is important in understanding ingroup identification and ingroup bias. For instance, research indicates that high

authoritarians are more favourable toward ingroups than outgroups (Altemeyer, 1988; Downing & Monaco, 1986; Eckhardt, 1991), and identify more strongly with their groups (Altemeyer, 1994; Duckitt, 1989, Perreault & Bourhis, 1999). Similarly, Shah et al. (1998) found that those people dispositionally high (vs low) in need for cognitive closure were more favourable toward ingroups than outgroups (Study 1), and that situational manipulations of need for closure precipitated increased ingroup identification and decreased outgroup identification (Study 2). Perreault & Bourhis (1999) report that ethnocentrism, authoritarianism, and personal need for structure (Neuberg & Newsom, 1993) were all positively correlated with identification, but not with ingroup bias (even though identification was positively related to ingroup bias). Path analyses revealed that ethnocentrism adds significantly to the prediction of bias when the other two variables are partialled out. Sidanius, Pratto and Mitchell (1994) conducted a study where participants evaluated minimal ingroups and outgroups rather than having them allocate resources. While those high in social dominance orientation (who desire ingroup dominance over outgroups) wanted greater distance between ingroups and outgroups, and reported less inclination to be cooperative with outgroups, they did not evaluate the ingroup more favourably than the outgroup (unless they were also high in identification).

Analyses in the present study found that COs identified with ingroups under both low and high task uncertainty, but that this identification was unrelated to ingroup bias. Several minimal groups studies (including the present one) have found that some personality differences are related to ingroup identification. Others, however, have found no relation between personality and ingroup bias (e.g., Perreault & Bourhis, 1999). Results of the present study suggest, however, that inclusion of a personality variable that

is theoretically expected to interact with situational conditions (e.g., uncertainty orientation) can be fruitful in explaining group behaviour. Note that Perreault and Bourhis (1999) tested a high uncertainty condition, as the standard Tajfel matrices are deemed very ambiguous and high in uncertainty (see Hogg & Mullin, 1999; Mullin & Hogg, 1998), and found no ingroup bias effects for authoritarianism or personal need for structure. In the present study, COs under these conditions did favour their ingroup.

Issues and Future Directions

Although the present study replicated the basic ingroup bias findings of the Mullin and Hogg (1998) study it was modelled after, it did so only for COs, and only for task (vs situational) uncertainty. COs are expected to make more use of heuristics under uncertain situations, and they did give more to their ingroups even though identification was itself not related to ingroup bias. This likely came naturally to them given their more group-oriented personality style (Hodson & Sorrentino, 1997). It is not surprising that effects for situational uncertainty were not found in the present study. While Mullin and Hogg were able to classify their participants into those having taken part in no previous psychology studies (high situational uncertainty) or five or more studies (low situational uncertainty), such a categorization was not possible with the present sample. Instead, a median split was conducted on the number of studies participants had completed. This measure is not ideal as a measure of situational uncertainty, and did not produce differences between conditions or personality types. With greater differentiation between low and high situational uncertainty groups, stronger effects would be predicted, but a stronger operationalization of situational uncertainty would be in order.

The failure of ingroup bias to be accompanied by increased ingroup identification is not a novel finding (see Hinkle & Brown, 1990 for a review), nor a consistent one (e.g., Grieve & Hogg, in press, Expts 1 & 2; but Perreault & Bourhis, 1999). The fact that it sometimes does not occur, however, does pose a problem for theories of group behaviour focusing on social identity. It is worth noting that in two of Hogg's studies that failed to find either increased identification or mediation of identification (Hogg & Grieve, in press; Mullin & Hogg, 1998), a 5-item measure of identification was employed (see also the present study). Using a 10-item measure, Grieve and Hogg (in press) did show an increase in identification with ingroup bias. It is unclear whether the addition of these items increased prediction of this variable, or whether another aspect of the testing situation was responsible for this effect. Item examination reveals no clue to the issue.

The central theme of the study, whether group members will show more ingroup bias under high than low uncertainty, was tested within the framework of both social identity and self-categorization theories, and as such has relied on the minimal group paradigm as a starting place. Although the minimal group paradigm has consistently revealed that categorization into social categories leads to intergroup discrimination (Brewer, 1979; Diehl, 1990; Hogg & Abrams, 1988; Messick & Mackie, 1989), some criticism has been levelled at the interpretation of the Tajfel matrices. For instance, Rabbie and colleagues (Rabbie, 1991; Rabbie, Schot, & Visser, 1989) propose an alternative explanation, namely that ingroup biasing strategies are both rational and self-serving, pivoting on the notion that participants expect reciprocation from ingroup members and consequently favour the ingroup. According to this Behavioural Interaction Model, categorization is not sufficient to lead to intergroup behaviour. Support for their

model has been seriously challenged elsewhere (see Bourhis, Turner, & Gagnon, 1997; Gagnon & Bourhis, 1996; Perreault & Bourhis, 1999). Tajfel matrices continue to be widely used in intergroup research, particularly within the social identity framework, offering a dependent measure that is subtle, relatively free of demand characteristics, and uses participants as controls against personal response biases (Bourhis et al., 1994; St. Claire & Turner, 1982; Turner, 1980). The commonly held view, therefore, is that “the Tajfel matrices constitute a sensitive dependent measure” (Bourhis et al., 1994, p.209) that “can provide psychologically meaningful and valid measures of intergroup behaviors” (Bourhis et al., 1994, p.227).

The next logical step in a programme of research would be to examine the impact of uncertainty using previously existing groups with real histories and face-to-face contact as opposed to the ad hoc “groups” assembled in the present study. It is possible that COs would show an even stronger tendency to identify with and favour their ingroup. The present study found no evidence that UOs favoured their ingroups. This is not to say, however, that UOs would never use an ingroup category as a heuristic. According to the uncertainty orientation model, UOs should show an increase in heuristic use under conditions of low uncertainty (Sorrentino et al., 1988). Given an existing and more meaningful group, UO group members should use the ingroup category as a heuristic and allocate more resources to the ingroup, but likely under conditions where they are personally unmotivated and, in a sense, cognitively lazy (see Forgas & Fiedler, 1996). This is an issue for future investigation. Given past and present findings, however, it is doubtful whether UOs would ever demonstrate the degree of ingroup

favouritism exhibited by COs under uncertainty, given the rather group biased, categorical nature of CO mental processing.

This again suggests that social categories may serve different purposes for UOs than COs. Although exploratory in nature, the self esteem measures did indicate that COs under high uncertainty showed a positive relationship ($r=.42$) between identification and self esteem. These participants felt positively about their group identification. For UOs under these conditions, the relationship was negative ($r=-.34$). This possibly reflects the fact that UOs were displeased with being a member of a group where group membership could offer no information in terms of reducing the uncertainty. That is, the ingroup category in the present study could only serve a heuristic value, and this possibly caused UOs who identified with their groups to feel more negatively about the self. Due to the correlational nature of these issues, however, future research is needed to more closely examine these issues.

A related issue concerns the nature of ingroup bias expressed in the present study. Ingroup bias was here operationalized as favouritism toward the ingroup in terms of resource allocation strategies. Alternatively, ingroup bias is operationalized as highly positive evaluations of the ingroup over the outgroup (e.g., Hinkle & Brown, 1990; Mullen, Brown, & Smith, 1992; Sidanius et al., 1994; Shah et al., 1998). Although related concepts, these are distinct properties of intergroup discrimination, and the distinction must be kept in mind when interpreting the results. Thus, although categorized COs showed high levels of identification regardless of uncertainty levels, they only showed ingroup bias (or favouritism) under high uncertainty, and identity was not significantly correlated with ingroup bias.

Brewer (1996) concludes that ingroup bias exhibited through resource allocation tasks typically reflects ingroup favouritism, a subtle form of discrimination, rather than outgroup derogation. This conceptual distinction has been stressed in other places (Brewer, 1979; Gaertner & McLaughlin, 1983; Mummendey, 1995). For instance, Otten, Mummendey and Blanz (1996) found that although categorization resulted in discriminatory behaviour favouring the ingroup when distributing positive resources (e.g., money), mere categorization could not lead to discriminatory behaviour when allocating negative consequences (e.g., unpleasant noises). The behaviour exhibited by COs under high uncertainty was indeed more concerned with favouring the ingroup than with derogating the outgroup.

Concluding Remarks

The present investigation tested the argument by Hogg and his colleagues (Hogg, in press; Hogg & Abrams, 1993; Hogg & Mullin, 1999) that social categorization results in ingroup bias under conditions of high but not low uncertainty. Although Hogg and Abrams may be correct in their belief that uncertainty is the key to group behaviour, it appears that one needs to consider individual differences simultaneously. That is, COs categorized under high (vs low) uncertainty conditions showed the strongest evidence of ingroup favouritism. Perreault and Bourhis (1999, p.101) suggest that “the minimal group paradigm provides an us-and-them environment that may activate the categorical world view of the [non-pathological] authoritarian.” COs similarly view social categories in a less complex and rich manner (Roney & Sorrentino, 1987). Thus it is argued here that the minimal group situation not only accentuated the us-vs-them nature of the social environment, but provided COs with a heuristic tool when faced with uncertainty, leading

them to favour the ingroup. This bias was not a function of increased identification, certainty ratings, or self-esteem, suggesting a more “casual” use of a rule-of-thumb under conditions of relatively high task uncertainty. This affords COs a convenient and satisfying manner in which to use an ingroup category as a basis for subjective judgment.

CHAPTER IV – GENERAL DISCUSSION AND CONCLUSIONS

The themes common to Study 1 and Study 2 involve concerns with uncertainty and the role of heuristics in judgments and behaviour. To some extent, the “heuristic” approach forwarded by social cognition researchers (Chaiken, 1980; Chen & Chaiken, 1999; Petty & Cacioppo, 1981, Petty & Wegener, 1999) stipulates that increased situational relevance, quite possibly through a mechanism such as intergroup conflict, decreases reliance on heuristics (simple decision and persuasion cues). One could argue that the social identity (Tajfel & Turner, 1979) and self-categorization (Turner et al., 1987) approaches have been pitted against this perspective. That is, increased situational relevance, again possibly via intergroup arenas, increases reliance on group categories, which may be interpreted as a heuristic. In this sense, group categories gain more meaning to the extent that the group context demands it. The former perspective appears to be driven primarily by information-processing goals, such as accuracy and defense motivation (Chaiken et al., 1996). The latter appears to be driven by issues relevant to the group context, where behaviour is governed by concerns of self-esteem maintenance (Tajfel & Turner, 1979), depersonalization processes, prototypic representations, self-definition, reality validation (Turner, 1985; Turner et al., 1987), or uncertainty reduction (Hogg, in press; Hogg & Abrams, 1993; Hogg & Mullin, 1999). Closer examination of these issues reveals that these perspectives may not be as contradictory as it would first appear. That is, these two basic overarching concerns may very well have more in common than they do in conflict, and the difference may lie in the level of analysis dictated by both (for a review see Operario & Fiske, 1999).

More to the point of the present study, the systematic vs heuristic processing distinction truly represents a continuum (Chaiken et al., 1989; Eagly & Chaiken, 1993; Fiske & Neuberg, 1990), and researchers in this field should keep this point in mind (Petty & Wegener, 1999). Part of the confusion stems from the seeming reluctance of social identity and self-categorization theorists to specifically label ingroup categories as heuristics, although they have done so at times (e.g., Abrams & Hogg, 1990; Mullin & Hogg, 1998). In the interest of espousing the importance of ingroup categories for group and individual life, these researchers almost treat “heuristic” like a dirty word, and this may in part be the fault of its presentation by the social cognition researchers. Unfortunately, heuristic processing is viewed as the lazy default manner of processing when compared with the more deliberative and demanding mode of systematic processing. This is unfortunate, because heuristics *can* be meaningful and accurate, as can the reliance on group categories, as specified by social identity and self-categorization theorists. That is, although it may be entirely rational and appropriate to be influenced by one’s ingroup (see Haslam et al, 1996), we cannot avoid the possibility, from a social cognition point of view, that the ingroup category might still be used as a heuristic under such circumstances. Thus, while it is entirely reasonable to listen to one’s doctor for medical advice, though this does not negate the fact that the category “doctor” can serve as a heuristic cue in gauging the validity of a message.

Based on the findings of the present research, the current state of social identity and self-categorization theories can be addressed. First, these approaches need to recognize that ingroup categories could be used as heuristic cues under some circumstances. Second, the role of individual differences in the categorization process

specifically, and group behaviour more generally, need to be further explored.

Assumptions that all people have the same goals in groups (Abrams & Hogg, 1993) and that most people deal with uncertainty in the same manner (Abrams & Hogg, 1993; Chaiken, 1980; Petty & Cacioppo, 1981) need to be reconsidered.

Across two studies, the present investigation introduced the uncertainty orientation construct to help understand the impact of uncertainty in groups and how such uncertainty is resolved. In the first study, it was expected that the degree of systematic vs heuristic processing evoked by the presentation of an ingroup or outgroup message would be moderated as a function of one's uncertainty orientation and the uncertainty inherent in the situation. To the extent that uncertainty is the key to group life, and that people carefully process information when the situation is uncertain, UOs should adhere to predictions relevant to the approach and resolution of uncertainty. COs were expected to perform in the opposite manner. All participants received strong or weak arguments from an ingroup or outgroup source, and these messages happened to be consistent with or contrary to their personal attitudes. As predicted, UOs showed differential evaluation between strong and weak arguments, on a variety of measures, under conditions of relatively high uncertainty based on social identity "conflicts" (i.e., disagreeing with the ingroup, agreeing with the outgroup). COs showed more evidence of this tendency under conditions of certainty (i.e., ingroup agreement, outgroup disagreement). These findings are consistent with the general theory of uncertainty orientation (Sorrentino et al., 1999; Sorrentino & Roney, 1999; Sorrentino & Short, 1986) and further extend uncertainty orientation into the domain of group behaviour and social influence.

Study 2 branched into the realm of intergroup resource allocation, addressing whether the ingroup category would more likely serve as a heuristic under conditions of uncertainty than certainty. To the extent that the general theory of uncertainty orientation is true, COs (vs UOs) should be the people falling under this rubric. It was predicted that more ingroup bias would be found for categorized than uncategorized participants, with this difference being greater under high than low uncertainty. This pattern in turn was expected to be greater for COs than UOs. Participants were either categorized or uncategorized, and assigned to a low or high task uncertainty condition. Results supported predictions - - COs did show strong evidence of ingroup favouritism, notably under high task uncertainty. Heightened levels of social consciousness partially mediated the process, whereas identification did not. In addition, these COs did not report higher self-esteem or certainty, nor did they engage in the severest form of discrimination possible using the Tajfel matrices. These data suggest that these participants used some variation of a "*look out for your own*" heuristic when allocating points. UOs, at least under these minimal group conditions, showed no evidence of ingroup bias.

The implications for both studies have already been addressed and will consequently not be covered here. It would appear, however, that group categories serve different functions for different types of people. Recent work on uncertainty orientation and group processes (e.g., Hodson & Sorrentino, 1997; see Sorrentino & Roney, 1999 for a review) are beginning to paint a fairly consistent picture. In keeping with their personalities, UOs are expected to use group categories, ingroup or outgroup, in the interest of resolving uncertainty. In Study 1, they showed more evidence of systematic processing when social categorization created uncertainty, and in Study 2 they did not

show ingroup favouritism toward a group that offered no information concerning the resolution of the uncertainty present. COs, on the other hand, are expected to use their group categories to the extent that such categories provide the basis of subjective judgment and experience, all in the interest of circumventing uncertainty. In Study 1, these people more carefully considered messages from group sources to the degree that careful processing could introduce little uncertainty. In other words, under “relaxed” and highly certain conditions they were motivated to carefully process messages where argument scrutiny could only reveal why they agree with an ingroup or disagree with an outgroup. In Study 2, COs placed in a situation where the appropriate procedures for allocating points were uncertain and dubious chose to award more points to their own group. Under these highly uncertain conditions, they defaulted to their tendency to use heuristics, of which ingroup favouritism is undoubtedly a strong tendency.

In closing, McGarty et al. (1994, p.270) warn that “the process of persuasion involves more than just information processing, because the way we process information is profoundly mediated by the way we perceive social reality.” The data from the present two studies take this caveat and raise it a level. To the extent that uncertainty is taken as key aspect of social categorization and group behaviour, personality differences in uncertainty orientation should moderate intragroup and intergroup phenomena.

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APPENDIX A

Study 1 Materials

The University of Western Ontario
Department of Psychology

September 2, 1997

MEMORANDUM

To: Gordon Hodson
From: Clive Seligman on behalf of the Ethics and Subject Pool Committee
Re: Ethical review of " Social judgements, campus issues..."
Protocol #97 09 03

STATUS

- Approved
 Approved conditional to making changes listed below
 (please file changes with your application to use the subject pool with Helen Harris in Rm. 7304)
 Please make the changes listed below and resubmit for review

SIGN-UP POSTER

- Briefly describe the task required of subjects
 Do not "hype" the advertising of your study
 Use 10cpi or 12cpi, with standard letter size, for description
 Other (see attached sheet)

INFORMED CONSENT SHEET

- Briefly describe the task the subjects are agreeing to perform
 Promise that the data will be kept confidential and used for research purposes only
 Promise that audio and/or video tapes will be erased, in part or entirely, at the subjects' wishes at any time
 State how many credits the subjects will receive for participation
 State that subjects may terminate the experiment at any time without loss of promised credit(s)
 State that there are no known risks to participation or state the risks
 State that subjects will receive written feedback at the end of the session or study and/or that subjects have had an opportunity to ask questions about the study
 Other (see attached sheet)

WRITTEN FEEDBACK

- Elaborate your feedback
 Rewrite your feedback at a level that is understandable to a Psychology 020/023 student
 Add a few references at the end and/or your name and how you can be reached
 Other (see attached sheet)

OTHER See attached comments

c. ✓ Sorrentino

[GH02.eth]

Consent Form (Phase I)

Social Judgements, Campus Issues, and Questionnaire Inventory

This session is concerned with several issues. It may take approximately 50 minutes to complete. You will be asked to read a speech about an academic issue and will be asked for your opinions on the issue. In an unrelated study, you will partake in a decision-making task where you will be asked to allocate points to other people. In the last study, you will be asked a series of questions relevant to your beliefs of different social groups, and you will be asked to engage in a brief discussion with another person. Afterwards you will be asked to complete some questions concerning your participation in today's session. All information that you provide will be kept strictly confidential. Afterwards you will be informed of the nature of this study. You will receive one research credit for your participation in today's session. There are no known physical or psychological risks from participating in this study. Your participation is voluntary; you may refuse to participate or withdraw from participation at any point of today's session and still receive a research credit. If you have any questions, please contact Dr. R. Sorrentino in the Department of Psychology at 679-2111 ext. 4658.

Having read the information sheet, I agree to participate in this study for the psychology department at the University of Western Ontario for which I will receive 1 academic research credit.

Name (print): _____

Signature: _____

Student No.: _____

Date: _____

Consent Form (Phase II)**Social Judgements, Campus Issues, and Questionnaire Inventory**

This session is concerned with several issues. It may take approximately 50 minutes to complete. You will be asked to read a speech about an academic issue and will be asked for your opinions on the issue. In an unrelated study, you will partake in an decision-making task where you will be asked to allocate points to other people. In the last study, you will be asked a series of questions relevant to your beliefs of different social groups, and you will be asked to engage in a brief discussion with another person. Afterwards you will be asked to complete some questions concerning your participation in today's session. All information that you provide will be kept strictly confidential. Afterwards you will be informed of the nature of this study. You will receive one research credit for your participation in today's session. There are no known physical or psychological risks from participating in this study. Your participation is voluntary; you may refuse to participate or withdraw from participation at any point of today's session and still receive a research credit. If you have any questions, please contact Dr. R. Sorrentino in the Department of Psychology at 679-2111 ext. 4658.

Having read the information sheet, I agree to participate in this study for the psychology department at the University of Western Ontario for which I will receive 1 academic research credit.

Name (print): _____ Student No.: _____

Signature: _____ Date: _____

Participant Debriefing

Dear Research Participant,

You have just participated in several social psychology experiments. In doing so, you have helped to contribute to the understanding of human behaviour, and we thank you for your participation. In addition, we hope that you learn something from this experience. The purpose of this letter is to inform you about the study.

We are interested in a personality dimension known as “uncertainty orientation” (Sorrentino & Short, 1986). Uncertainty-oriented people are those who like to learn new things about themselves and their environments. Certainty-oriented people are those who are typically more interested in maintaining clarity about what they already know. We are interested in how these personality differences influence group processes. Today you have taken part in three separate studies. Please note: There is nothing good or bad about being either uncertainty-oriented or certainty-oriented; people simply differ in how they deal with uncertainty.

1. The first study is interested in how people process information from members of their own group (i.e., their ingroup) or from another group (i.e., their outgroup). To test this, we had people read strong and weak arguments about the issue of comprehensive exams. We told some of the study participants that the message was given by a UWO student (ingroup) or a University of Ottawa student (outgroup), when in reality the same arguments were shown to all participants. We expect that people will be differentiated between strong and weak arguments from their ingroup (because these arguments are more relevant to people) than from their outgroup. This is what we expect from uncertainty-oriented people. We expect that this effect will be smaller, or even reversed for certainty-oriented people, who might accept the ingroup message regardless of how strong or weak it is. Please note that as far as we are aware, comprehensive exams will not be instituted at this or any other university in Ontario.

2. Some researchers believe that the prime function of groups is to reduce uncertainty (e.g., Hogg & Abrams, 1993). The second study tested this idea. Basically, we are testing whether people will show more ingroup favoritism when allocating points when the situation is uncertain. Such a strategy would suggest that the ingroup becomes an important way to lower uncertainty levels. We expect this to be true of certainty-oriented people, because they don't like to resolve uncertainty themselves, and are more likely to rely on their group identity to reduce their uncertainty. We expect the opposite of the uncertainty-oriented people, who like to resolve uncertainty themselves; they will likely show ingroup favoritism when they are uninterested in the task (i.e., when there is lots of certainty). To test this idea, we gave some people more practice and instructions on the point allocation task, so make the situation less uncertain. In addition, some participants were told that they were randomly assigned to given groups, where others were not made aware of assignment to groups. We did this because we expect people to show ingroup favoritism only to the extent that their group identity is made salient (or evident) to them.

So we hope that you have enjoyed your participation and have learned a great deal from the studies. If you have any questions, please feel free to contact my advisor, Dr. Richard Sorrentino at 679-2111 ext 4658..

Good luck with your studies!

Gordon Hodson (PhD student)
SSC rm 7234.

Suggested Readings:

Hogg, M.A., & Abrams, D. (1993). Towards a single-process uncertainty-reduction model of social motivation in groups. In M.A. Hogg & D.Abrams (Eds.), Group motivation: Social psychological perspectives (pp. 173-190). London: Harvester-Wheatsheaf.

Mackie, D.M., Worth, L.T., & Asuncion, A.G. (1990). Processing of persuasive in-group messages. Journal of Personality and Social Psychology, 58, 812-822.

Sorrentino, R.M. & Short, J.C. (1986). Uncertainty orientation, motivation and cognition. In R.M. Sorrentino & E.T. Higgins (Eds.), The handbook of motivation and cognition: Foundations of social behaviour (Vol 1. pp. 379-403). New York: Guilford Press.

Uncertainty Orientation Measures: Need for Uncertainty

SENTENCE INTERPRETATION

Instructions

You are going to see a series of sentences, and your task is to tell a story that is suggested to you by each sentence. Try to imagine what is going on. Then tell what the situation is, what lead up to the situation, what the people are thinking, feeling, and what they will do.

In other words, write as much of a story as you can – a story with plot and characters.

You will have twenty (20) seconds to look at a sentence and then 4 minutes to write your story about it. Write your first impressions and work rapidly. I will keep time and tell you when it is time to finish your story and to get ready for the next sentence.

There are no right or wrong stories or kinds of stories, so you may feel free to write whatever story is suggested to you when you look at a sentence. Spelling, punctuation, and grammar are not important. What is important is to write out as fully and as quickly as possible the story that comes into your mind as you imagine what is going on.

Notice that there is one page for writing each story. If you need more space for writing any story, use the reverse side of the paper.

The 4 sentences are:

- (1) Two people are working in a laboratory on a piece of equipment.
- (2) A person is sitting, wondering about what may happen.
- (3) A young person is standing: Some kind of operation can be seen in the background.
- (4) A person is thinking: An image of crossroads is in the person's mind.

The 4 questions are:

- (1) What is happening? Who is (are) the person(s)?
- (2) What has lead up to this situation? That is, what has happened in the past?
- (3) What is being thought? What is wanted? By whom?
- (4) What will happen? What will be done?

Uncertainty Orientation Measures: Authoritarianism

The following is a study of what the general public thinks and feels about a number of important social and personal questions. The best answer to each statement below is your personal opinion. We have tried to cover many different and opposing points of view; you may find yourself agreeing strongly with some of the statements, disagreeing just as strongly with others, and perhaps uncertain about others; whether you agree or disagree with any statement, you can be sure that many people feel the same as you do.

Circle +3, +2, +1, or -1, -2, -3, depending on how you feel in each case.

+1: I AGREE A LITTLE	-1: I DISAGREE A LITTLE
+2: I AGREE SOMEWHAT	-2: I DISAGREE SOMEWHAT
+3: I AGREE VERY MUCH	-3: I DISAGREE VERY MUCH

1. There is hardly anything lower than a person who does not feel a great love, gratitude and respect for his or her parents.

+3 +2 +1 -1 -2 -3

2. An insult to our honour should always be punished.

+3 +2 +1 -1 -2 -3

3. Books and movies ought not to deal so much with the unpleasant and seamy side of life; they ought to concentrate on themes that are entertaining or uplifting.

+3 +2 +1 -1 -2 -3

4. What the youth needs most is strict discipline, rugged determination, and the will to work and fight for family and country.

+3 +2 +1 -1 -2 -3

5. No sane, normal, decent person could ever think of hurting a close friend or relative.

+3 +2 +1 -1 -2 -3

6. Young people sometimes get rebellious ideas, but as they grow up they ought to get over them and settle down.

+3 +2 +1 -1 -2 -3

7. The findings of science may someday show that many of our most cherished beliefs are wrong. *

+3 +2 +1 -1 -2 -3

8. People ought to pay more attention to new ideas, even if they seem to go against the Canadian way of life. *

+3 +2 +1 -1 -2 -3

9. If people would talk less and work more everybody would be better off.

+3 +2 +1 -1 -2 -3

10. A person who has bad manners, habits, and breeding can hardly expect to get along with decent people.

+3 +2 +1 -1 -2 -3

11. Insults to our honour are not always important enough to bother about. *

+3 +2 +1 -1 -2 -3

12. It's right for people to raise questions about even the most sacred matters. *

+3 +2 +1 -1 -2 -3

13. Obedience and respect for authority are the most important virtues children should learn.

+3 +2 +1 -1 -2 -3

14. There is no reason to punish any crime with the death penalty. *

+3 +2 +1 -1 -2 -3

15. Anyone who would interpret the Bible literally just doesn't know much about geology, biology, or history. *

+3 +2 +1 -1 -2 -3

16. In this scientific age the need for a religious belief is more important than ever before.

+3 +2 +1 -1 -2 -3

17. When they are little, kids sometimes think about doing harm to one or both of their parents.

+3 +2 +1 -1 -2 -3

18. It is possible that creatures on other planets have founded a better society than ours. *

+3 +2 +1 -1 -2 -3

19. The prisoners in our corrective institutions, regardless of the nature of their crimes should be treated humanely. *

+3 +2 +1 -1 -2 -3

20. The sooner people realize that we must get rid of all traitors in the government, the better off we'll be.

+3 +2 +1 -1 -2 -3

21. Some of the greatest atrocities in history have been committed in the name of religion and morality. *

+3 +2 +1 -1 -2 -3

* reverse scored

Student Attitude Survey

This survey is aimed at determining how students feel about "life on campus". Please answer the following questions about University life here at Western.

1. Rate how you feel about the University making graduation for seniors dependent on the completion of comprehensive examinations in the students' main area of study.

very undesirable	1	2	3	4	5	6	7	8	9	very desirable
---------------------	---	---	---	---	---	---	---	---	---	-------------------

2. How important is the issue of comprehensive exams to you personally?

not very important	1	2	3	4	5	6	7	8	9	very important
-----------------------	---	---	---	---	---	---	---	---	---	-------------------

3. Rate how you feel about changing the University year to a "tri-semester", where students would have three semesters, from September to June, but would also be finished their degree sooner.

very undesirable	1	2	3	4	5	6	7	8	9	very desirable
---------------------	---	---	---	---	---	---	---	---	---	-------------------

4. How important is the issue of tri-semester academic years to you?

very unimportant	1	2	3	4	5	6	7	8	9	very important
---------------------	---	---	---	---	---	---	---	---	---	-------------------

5. Rate how you feel about the University instituting entrance requirement examinations.

very undesirable	1	2	3	4	5	6	7	8	9	very desirable
---------------------	---	---	---	---	---	---	---	---	---	-------------------

6. How important is the issue of entrance examinations to you?

not very important	1	2	3	4	5	6	7	8	9	very important
-----------------------	---	---	---	---	---	---	---	---	---	-------------------

7. How much time do you spend, or plan to spend, doing extracurricular activities such as hobbies, sports, or social events.

very little	1	2	3	4	5	6	7	8	9	very much
-------------	---	---	---	---	---	---	---	---	---	-----------

8. Please circle a number to rate how much you participate, or plan to participate, in sports programs offered and/or use the sports facilities at the University.

very little 1 2 3 4 5 6 7 8 9 very much

9. Please circle a number to rate the quality of pubs on campus.

very poor 1 2 3 4 5 6 7 8 9 very good

10. Please circle a number to rate the quality of campus cafeterias.

very poor 1 2 3 4 5 6 7 8 9 very good

11. Please indicate your current year of study in your degree _____

Persuasive Message (Ingroup Strong)

We are interested in people's perceptions of delegates who are representing their constituents at conferences. You will be reading a speech that was delivered by a delegate at an intercollegiate conference. The particular argument that you will be reading was presented by a student from The University of Western Ontario. The speech discusses whether undergraduate university students should be required to complete comprehensive exams in their area of concentration before receiving their degrees. This issue is currently a popular topic of debate among university administrators across Canada. In fact, the Ontario Ministry of Education is currently considering the institution of comprehensive exams for undergraduates. Please read the speech and then we will ask you some questions about the speech and the delegate.

Summary of Arguments Presented by The University of Western Ontario Student Representative

I'm strongly in favour of the idea that university undergraduate students should be required to pass comprehensive exams before being granted their degrees.

First, prestigious universities have comprehensive exams in order to maintain academic excellence. Eight of the top ten schools in the United States use comprehensive exams. Only three universities below the top ten use comprehensive exams.

Second, institution of comprehensive exams has led to a reversal in the declining scores on standardized achievement tests. Schools that implement the exams report a significant increase in GPA scores of graduating students in the years following the implementation of the exams. Thus, these students are more likely to get jobs and to get into graduate school.

Third, graduate and professional schools have shown a preference for undergraduates who have passed a comprehensive exam. These schools accept students who have passed these exams approximately 30% more often than they accept students who have not taken comprehensive exams.

Fourth, the average starting salaries are 23% higher for graduates of schools with comprehensive exams.

Fifth, schools with the exams attract larger and more well-known corporations to recruit students for jobs.

Finally, the provincial government might increase financial support if exams were instituted, thereby allowing a tuition decrease (valued at approximately \$125/year).

Persuasive Message (Outgroup Strong)

We are interested in people's perceptions of delegates who are representing their constituents at conferences. You will be reading a speech that was delivered by a delegate at an intercollegiate conference. The particular argument that you will be reading was presented by a student from The University of Ottawa. The speech discusses whether undergraduate university students should be required to complete comprehensive exams in their area of concentration before receiving their degrees. This issue is currently a popular topic of debate among university administrators across Canada. In fact, the Ontario Ministry of Education is currently considering the institution of comprehensive exams for undergraduates. Please read the speech and then we will ask you some questions about the speech and the delegate.

Summary of Arguments Presented by The University of Ottawa Student Representative

I'm strongly in favour of the idea that university undergraduate students should be required to pass comprehensive exams before being granted their degrees.

First, prestigious universities have comprehensive exams in order to maintain academic excellence. Eight of the top ten schools in the United States use comprehensive exams. Only three universities below the top ten use comprehensive exams.

Second, institution of comprehensive exams has led to a reversal in the declining scores on standardized achievement tests. Schools that implement the exams report a significant increase in GPA scores of graduating students in the years following the implementation of the exams. Thus, these students are more likely to get jobs and to get into graduate school.

Third, graduate and professional schools have shown a preference for undergraduates who have passed a comprehensive exam. These schools accept students who have passed these exams approximately 30% more often than they accept students who have not taken comprehensive exams.

Fourth, the average starting salaries are 23% higher for graduates of schools with comprehensive exams.

Fifth, schools with the exams attract larger and more well-known corporations to recruit students for jobs.

Finally, the provincial government might increase financial support if exams were instituted, thereby allowing a tuition decrease (valued at approximately \$125/year).

Persuasive Message (Ingroup Weak)

We are interested in people's perceptions of delegates who are representing their constituents at conferences. You will be reading a speech that was delivered by a delegate at an intercollegiate conference. The particular argument that you will be reading was presented by a student from The University of Western Ontario. The speech discusses whether undergraduate university students should be required to complete comprehensive exams in their area of concentration before receiving their degrees. This issue is currently a popular topic of debate among university administrators across Canada. In fact, the Ontario Ministry of Education is currently considering the institution of comprehensive exams for undergraduates. Please read the speech and then we will ask you some questions about the speech and the delegate.

Summary of Arguments Presented by The University of Western Ontario Student Representative

I'm strongly in favour of the idea that university undergraduate students should be required to pass comprehensive exams before being granted their degrees.

First, adopting the exams would allow the university to be at the forefront of a national trend. Some professors have indicated that they know of some universities that are considering implementing the exams.

Second, graduate students have complained that, since they have to take comprehensive exams, undergraduates should have to take them also. The university should give undergraduates the comprehensive exams and, consequently, avoid irritating the graduate student union.

Third, by not administering the exams, the university would be continuing its violation of an academic tradition. Numerous people have complained that we have already lost too many traditions.

Fourth, the exams would increase student fear and anxiety enough to promote extra studying. Many teachers have said that the problem with students today is that they do not study enough.

Fifth, parents have written to the committee to support the plan. One parent even said: "I would approve of anything that made my daughter work harder".

Finally, the exams would give students another opportunity to display their knowledge.

Persuasive Message (Outgroup Weak)

We are interested in people's perceptions of delegates who are representing their constituents at conferences. You will be reading a speech that was delivered by a delegate at an intercollegiate conference. The particular argument that you will be reading was presented by a student from The University of Ottawa. The speech discusses whether undergraduate university students should be required to complete comprehensive exams in their area of concentration before receiving their degrees. This issue is currently a popular topic of debate among university administrators across Canada. In fact, the Ontario Ministry of Education is currently considering the institution of comprehensive exams for undergraduates. Please read the speech and then we will ask you some questions about the speech and the delegate.

Summary of Arguments Presented by The University of Ottawa Student Representative

I'm strongly in favour of the idea that university undergraduate students should be required to pass comprehensive exams before being granted their degrees.

First, adopting the exams would allow the university to be at the forefront of a national trend. Some professors have indicated that they know of some universities that are considering implementing the exams.

Second, graduate students have complained that, since they have to take comprehensive exams, undergraduates should have to take them also. The university should give undergraduates the comprehensive exams and, consequently, avoid irritating the graduate student union.

Third, by not administering the exams, the university would be continuing its violation of an academic tradition. Numerous people have complained that we have already lost too many traditions.

Fourth, the exams would increase student fear and anxiety enough to promote extra studying. Many teachers have said that the problem with students today is that they do not study enough.

Fifth, parents have written to the committee to support the plan. One parent even said: "I would approve of anything that made my daughter work harder".

Finally, the exams would give students another opportunity to display their knowledge.

Post- Exposure Dependent Measures

Intercollegiate Debate Questionnaire

Please answer the following questions by circling the number on the scales provided that best reflects your position.

1. Rate how you feel about the University making graduation for seniors dependent on the completion of comprehensive examinations in the students' main area of study.

very undesirable	1	2	3	4	5	6	7	8	9	very desirable
---------------------	---	---	---	---	---	---	---	---	---	-------------------

2. Comprehensive exams are:

(a) good	1	2	3	4	5	6	7	8	9	bad
----------	---	---	---	---	---	---	---	---	---	-----

(b) wise	1	2	3	4	5	6	7	8	9	foolish
----------	---	---	---	---	---	---	---	---	---	---------

(c) beneficial	1	2	3	4	5	6	7	8	9	harmful
----------------	---	---	---	---	---	---	---	---	---	---------

3. How sure are you of your position on the issue?

not at all sure	1	2	3	4	5	6	7	8	9	very sure
--------------------	---	---	---	---	---	---	---	---	---	--------------

4. How important is this issue to you?

not at all important	1	2	3	4	5	6	7	8	9	very important
-------------------------	---	---	---	---	---	---	---	---	---	-------------------

5. How would you rate the arguments that the delegate used to support their position?

very weak	1	2	3	4	5	6	7	8	9	very strong
--------------	---	---	---	---	---	---	---	---	---	----------------

6. How expert do you think the delegate was?

not at all expert	1	2	3	4	5	6	7	8	9	very expert
----------------------	---	---	---	---	---	---	---	---	---	----------------

7. How persuasive do you think the message was?

not at all persuasive	1	2	3	4	5	6	7	8	9	very persuasive
--------------------------	---	---	---	---	---	---	---	---	---	--------------------

8. How trustworthy do you think the delegate was?

not at all trustworthy	1	2	3	4	5	6	7	8	9	very trustworthy
---------------------------	---	---	---	---	---	---	---	---	---	---------------------

9. What position on the issue (of whether universities should adopt a policy of comprehensive exams for undergraduates) do you think the delegate expressed in the message that you just read?

strongly
opposed to
implementation

1

2

3

4

5

6

7

8

9

strongly
in favour of
implementation

APPENDIX B

Study 2 Materials

Verbal Instructions for Completion of Matrices and Practice Matrix (Categorized Participants) Adapted from Bourhis et al. (1994)

Here is the way to complete your response booklet. Each page in the response booklet contains one matrix. A matrix consists of 13 boxes, each containing two numbers. On each matrix you are to award points to two other people. The top row of numbers within the boxes are the points to be awarded to Individual 60 from Group Z, and the bottom row are points to be given to Individual 73 from Group Y. After looking at each box of the matrix, you must choose only one box that represents your choice of how you wish to award the points.

Let me give you an example of how to use the matrix. Let us say you are faced with the following matrix that we have on display for you on this chart [**show practice matrix to individual**]. In addition to your group label [**point on chart**], each of you has received a personal identification letter [**point**].

Now suppose you are distributing points for Member 60 of Group Z and Member 73 of Group Y. Think very carefully about all the numbers in the boxes. There are a variety of choices you can make. Let us say that you decide to choose a box toward the left-hand edge of this matrix, for example, Box 11

5

This means that you decide to give 11 points to Member 60 of Group Z and 5 points to Member 73 of Group Y. Alternatively, you might choose Box 15

13

This means you are giving 15 points to Member 60 of Group Z and 13 points to Member 73 of Group Y. On the other hand, you might decide to choose Box 17

17

which means that Member 60 of Group Z and Member 73 of Y each get 17 points.

Another option is choosing Box 20

23

This means you are willing to give 20 points to Member 60 of Group Z, whereas Member 73 of Group Y gets 23 points. Further on in the matrix you can choose Box 23

29

in which Member 60 of Group Z gets 23 points, whereas Member 73 of Group Y gets 29 points.

Once again, you are not allowed to choose different numbers from different boxes on the same page. For instance, in our example here, you are not allowed to give 18 points to Member 60 of Group Z and 25 points (from another box) to Member 73 of Group Y. If you decide to give 18 points to Member 60 of Group Z, then it means that you have also chosen 19 points for Member 73 of Group Y. So please consider your choices carefully when you make them.

Now, each matrix page in the booklet contains different matrices, with different combinations of numbers in the boxes. So, as you go from one page to another, choose your boxes very carefully. Please note that you are never awarding points to yourself.

We arranged the booklets so that your own individual identification letter never appears on the matrices in your booklet. Of course, we do not want you to give points to yourselves.

Regardless of your final choices, make sure that before each decision you carefully examine the two numbers contained in each box of the matrix. Once you make your decision, tick the box you chose and also write the numbers representing your choice in the spaces provided below each scale [show this on chart]. You may proceed now.

Sample Matrix

Points for Member
60 of **Group Z**

11	12	13	14	15	16	17	18	19	20	21	22	23
5	7	9	11	13	15	17	19	21	23	25	27	29

Points for Member
73 of **Group Y**

Points given to Member 60 of Group Z: _____

Points given to Member 73 of Group Y: _____

Verbal Instructions for Completion of Matrices and Practice Matrix (Uncategorized Participants)

Here is the way to complete your response booklet. Each page in the response booklet contains one matrix. A matrix consists of 13 boxes, each containing two numbers. On each matrix you are to award points to two other people. The top row of numbers within the boxes are the points to be awarded to Individual 60, and the bottom row are points to be given to Individual 73. After looking at each box of the matrix, you must choose only one box that represents your choice of how you wish to award the points.

Let me give you an example of how to use the matrix. Let us say you are faced with the following matrix that we have on display for you on this chart [**show practice matrix to individual**]. In addition to your group label [**point on chart**], each of you has received a personal identification letter [**point**].

Now suppose you are distributing points for Individual 60 and Individual 73. Think very carefully about all the numbers in the boxes. There are a variety of choices you can make. Let us say that you decide to choose a box toward the left-hand edge of this matrix, for example, Box 11

5

This means that you decide to give 11 points to Individual 60 and 5 points to Individual 73. Alternatively, you might choose Box 15

13

This means you are giving 15 points to Individual 60 and 13 points to Individual 73. On the other hand, you might decide to choose Box 17

17

which means that Individual 60 and Individual 73 each get 17 points. Another option is choosing Box 20

23

This means you are willing to give 20 points to Individual 60, whereas Individual 73 gets 23 points. Further on in the matrix you can choose Box 23

29

in which Individual 60 gets 23 points, whereas Individual 73 gets 29 points.

Once again, you are not allowed to choose different numbers from different boxes on the same page. For instance, in our example here, you are not allowed to give 18 points to Individual 60 and 25 points (from another box) to Individual 73. If you decide to give 18 points to Individual 60, then it means that you have also chosen 19 points for Individual 73. So please consider your choices carefully when you make them.

Now, each matrix page in the booklet contains different matrices, with different combinations of numbers in the boxes. So, as you go from one page to another, choose your boxes very carefully. Please note that you are never awarding points to yourself. We arranged the booklets so that your own individual identification letter never appears

on the matrices in your booklet. Of course, we do not want you to give points to yourselves.

Regardless of your final choices, make sure that before each decision you carefully examine the two numbers contained in each box of the matrix. Once you make your decision, tick the box you chose and also write the numbers representing your choice in the spaces provided below each scale [show this on chart]. You may proceed now.

Sample Matrix

Points for Individual
60

11	12	13	14	15	16	17	18	19	20	21	22	23
5	7	9	11	13	15	17	19	21	23	25	27	29

Points for Individual
73

Points given to Individual 60: _____

Points given to Individual 73: _____

Practice Materials for Point Allocation Task

Points for Member
21 of **Group Z**

21	20	19	18	17	16	15	14	13	12	11	10	9
3	5	7	9	11	13	15	17	19	21	23	25	27

Points for Member
54 of **Group Y**

Points given to Member 21 of Group Z: _____

Points given to Member 54 of Group Y: _____

Points for Member
25 of **Group Z**

27	25	23	21	19	17	15	13	11	9	7	5	3
9	10	11	12	13	14	15	16	17	18	19	20	21

Points for Member
56 of **Group Y**

Points given to Member 25 of Group Z: _____

Points given to Member 56 of Group Y: _____

Points for Member
23 of **Group Z**

25	24	23	22	21	20	19	18	17	16	15	14	13
31	29	27	25	23	21	19	17	15	13	11	9	7

Points for Member
51 of **Group Y**

Points given to Member 23 of Group Z: _____

Points given to Member 51 of Group Y: _____

Points for Member
27 of Group Z

7	9	11	13	15	17	19	21	23	25	27	29	31
13	14	15	16	17	18	19	20	21	22	23	24	25

Points for Member
57 of Group Y

Points given to Member 27 of Group Z: _____

Points given to Member 57 of Group Y: _____

Points for Member
26 of Group Z

18	19	20	21	22	23	24	25	26	27	28	29	30
18	17	16	15	14	13	12	11	10	9	8	7	6

Points for Member
53 of Group Y

Points given to Member 26 of Group Z: _____

Points given to Member 53 of Group Y: _____

Points for Member
29 of Group Z

6	7	8	9	10	11	12	13	14	15	16	17	18
30	29	28	27	26	25	24	23	22	21	20	19	18

Points for Member
52 of Group Y

Points given to Member 29 of Group Z: _____

Points given to Member 52 of Group Y: _____

Practice Materials for Point Allocation Task

Points for Individual

21

21	20	19	18	17	16	15	14	13	12	11	10	9
3	5	7	9	11	13	15	17	19	21	23	25	27

Points for Individual

54

Points given to Individual 21: _____

Points given to Individual 54: _____

Points for Individual

25

27	25	23	21	19	17	15	13	11	9	7	5	3
9	10	11	12	13	14	15	16	17	18	19	20	21

Points for Individual

56

Points given to Individual 25: _____

Points given to Individual 56: _____

Points for Individual

23

25	24	23	22	21	20	19	18	17	16	15	14	13
31	29	27	25	23	21	19	17	15	13	11	9	7

Points for Individual

51

Points given to Individual 23: _____

Points given to Individual 51: _____

Points for Individual

27

7	9	11	13	15	17	19	21	23	25	27	29	31
13	14	15	16	17	18	19	20	21	22	23	24	25

Points for Individual

57

Points given to Individual 27: _____

Points given to Individual 57: _____

Points for Individual

26

18	19	20	21	22	23	24	25	26	27	28	29	30
18	17	16	15	14	13	12	11	10	9	8	7	6

Points for Individual

53

Points given to Individual 26: _____

Points given to Individual 53: _____

Points for Individual

29

6	7	8	9	10	11	12	13	14	15	16	17	18
30	29	28	27	26	25	24	23	22	21	20	19	18

Points for Individual

52

Points given to Individual 29: _____

Points given to Individual 52: _____

Filler Task (for High Uncertainty Condition)

For the following task, please organize and re-write the following list of names into two alphabetical lists, one for male names, and one for female names.

- | | |
|-----------|------------|
| - Robert | - Michael |
| - John | - Meredith |
| - Linda | - Julie |
| - Richard | - Gregory |
| - Karen | - Marie |

Male Names (alphabetized)

1. _____
2. _____
3. _____
4. _____
5. _____

Female Names (alphabetized)

1. _____
2. _____
3. _____
4. _____
5. _____

Tajfel Matrices for Categorized Participants (one per page)

Points for Member
38 of **Group Z**

19	18	17	16	15	14	13	12	11	10	9	8	7
1	3	5	7	9	11	13	15	17	19	21	23	25

Points for Member
46 of **Group Y**

Points given to Member 38 of Group Z: _____

Points given to Member 46 of Group Y: _____

Points for Member
37 of **Group Z**

1	3	5	7	9	11	13	15	17	19	21	23	25
7	8	9	10	11	12	13	14	15	16	17	18	19

Points for Member
43 of **Group Y**

Points given to Member 37 of Group Z: _____

Points given to Member 43 of Group Y: _____

Points for Member
35 of **Group Z**

16	17	18	19	20	21	22	23	24	25	26	27	28
16	15	14	13	12	11	10	9	8	7	6	5	4

Points for Member
44 of **Group Y**

Points given to Member 35 of Group Z: _____

Points given to Member 44 of Group Y: _____

Points for Member
39 of **Group Z**

25	23	21	19	17	15	13	11	9	7	5	3	1
7	8	9	10	11	12	13	14	15	16	17	18	19

Points for Member
49 of **Group Y**

Points given to Member 39 of Group Z: _____

Points given to Member 49 of Group Y: _____

Points for Member
33 of **Group Z**

19	18	17	16	15	14	13	12	11	10	9	8	7
25	23	21	19	17	15	13	11	9	7	5	3	1

Points for Member
42 of **Group Y**

Points given to Member 33 of Group Z: _____

Points given to Member 42 of Group Y: _____

Points for Member
36 of **Group Z**

4	5	6	7	8	9	10	11	12	13	14	15	16
28	27	26	25	24	23	22	21	20	19	18	17	16

Points for Member
40 of **Group Y**

Points given to Member 36 of Group Z: _____

Points given to Member 40 of Group Y: _____

Points for Member
32 of **Group Z**

23	22	21	20	19	18	17	16	15	14	13	12	11
5	7	9	11	13	15	17	19	21	23	25	27	29

Points for Member
41 of **Group Y**

Points given to Member 32 of Group Z: _____

Points given to Member 41 of Group Y: _____

Points for Member
30 of **Group Z**

29	27	25	23	21	19	17	15	13	11	9	7	5
11	12	13	14	15	16	17	18	19	20	21	22	23

Points for Member
47 of **Group Y**

Points given to Member 30 of Group Z: _____

Points given to Member 47 of Group Y: _____

Points for Member
31 of **Group Z**

21	20	19	18	17	16	15	14	13	12	11	10	9
27	25	23	21	19	17	15	13	11	9	7	5	3

Points for Member
45 of **Group Y**

Points given to Member 31 of Group Z: _____

Points given to Member 45 of Group Y: _____

Points for Member
33 of **Group Z**

3	5	7	9	11	13	15	17	19	21	23	25	27
9	10	11	12	13	14	15	16	17	18	19	20	21

Points for Member
48 of **Group Y**

Points given to Member 33 of Group Z: _____

Points given to Member 48 of Group Y: _____

Points for Member
38 of **Group Z**

14	15	16	17	18	19	20	21	22	23	24	25	26
14	13	12	11	10	9	8	7	6	5	4	3	2

Points for Member
43 of **Group Y**

Points given to Member 38 of Group Z: _____

Points given to Member 43 of Group Y: _____

Points for Member
30 of **Group Z**

2	3	4	5	6	7	8	9	10	11	12	13	14
26	25	24	23	22	21	20	19	18	17	16	15	14

Points for Member
41 of **Group Y**

Points given to Member 30 of Group Z: _____

Points given to Member 41 of Group Y: _____

Tajfel Matrices for Uncategorized Participants

Points for Individual

27

19	18	17	16	15	14	13	12	11	10	9	8	7
1	3	5	7	9	11	13	15	17	19	21	23	25

Points for Individual

41

Points given to Individual 27: _____

Points given to Individual 41: _____

Points for Individual

26

1	3	5	7	9	11	13	15	17	19	21	23	25
7	8	9	10	11	12	13	14	15	16	17	18	19

Points for Individual

42

Points given to Individual 26: _____

Points given to Individual 42: _____

Points for Individual

25

16	17	18	19	20	21	22	23	24	25	26	27	28
16	15	14	13	12	11	10	9	8	7	6	5	4

Points for Individual

43

Points given to Individual 25: _____

Points given to Individual 43: _____

Points for Individual

23

25	23	21	19	17	15	13	11	9	7	5	3	1
7	8	9	10	11	12	13	14	15	16	17	18	19

Points for Individual

45

Points given to Individual 23: _____

Points given to Individual 45: _____

Points for Individual

22

19	18	17	16	15	14	13	12	11	10	9	8	7
25	23	21	19	17	15	13	11	9	7	5	3	1

Points for Individual

46

Points given to Individual 22: _____

Points given to Individual 46: _____

Points for Individual

21

4	5	6	7	8	9	10	11	12	13	14	15	16
28	27	26	25	24	23	22	21	20	19	18	17	16

Points for Individual

47

Points given to Individual 21: _____

Points given to Individual 47: _____

Points for Individual
20

23	22	21	20	19	18	17	16	15	14	13	12	11
5	7	9	11	13	15	17	19	21	23	25	27	29

Points for Individual
48

Points given to Individual 20: _____

Points given to Individual 48: _____

Points for Individual
19

29	27	25	23	21	19	17	15	13	11	9	7	5
11	12	13	14	15	16	17	18	19	20	21	22	23

Points for Individual
49

Points given to Individual 19: _____

Points given to Individual 49: _____

Points for Individual
18

21	20	19	18	17	16	15	14	13	12	11	10	9
27	25	23	21	19	17	15	13	11	9	7	5	3

Points for Individual
50

Points given to Individual 18: _____

Points given to Individual 50: _____

Points for Individual
17

3	5	7	9	11	13	15	17	19	21	23	25	27
9	10	11	12	13	14	15	16	17	18	19	20	21

Points for Individual
51

Points given to Individual 17: _____

Points given to Individual 51: _____

Points for Individual
16

14	15	16	17	18	19	20	21	22	23	24	25	26
14	13	12	11	10	9	8	7	6	5	4	3	2

Points for Individual
52

Points given to Individual 16: _____

Points given to Individual 52: _____

Points for Individual
15

2	3	4	5	6	7	8	9	10	11	12	13	14
26	25	24	23	22	21	20	19	18	17	16	15	14

Points for Individual
53

Points given to Individual 15: _____

Points given to Individual 53: _____

Ingroup Identification Measure for Categorized Participants
Point Allocation Questionnaire

1. How much do you think that you might like the members of your group (i.e., Group Z)?

not very much	1	2	3	4	5	6	7	8	9	very much
------------------	---	---	---	---	---	---	---	---	---	--------------

2. How similar do you think that you might be to members of Group Z in terms of general attitudes and opinions?

not at all similar	1	2	3	4	5	6	7	8	9	very similar
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3. To what extent would you like to get to know members of Group Z?

very disinterested	1	2	3	4	5	6	7	8	9	very interested
-----------------------	---	---	---	---	---	---	---	---	---	--------------------

4. To what extent did you feel that you belonged to Group Z?

not at all	1	2	3	4	5	6	7	8	9	very much so
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5. Of which group would you rather be a member?

very much like to be member of Y	1	2	3	4	5	6	7	8	9	very much like to be member
				(no interest in either)						

APPENDIX C

Additional ANOVA Summary Tables and Tables

Table 1-3

Analysis of Variance Summary for 3-way Interaction of Uncertainty Orientation (U.O.),Source, and Quality on Pre-Exposure Attitudes Toward Comprehensive Exams

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	6.28	1.67	.198
Source	1	5.95	1.59	.210
Quality	1	1.86	.50	.482
<u>2-Way Interactions</u>				
Quality X Source	1	1.03	.28	.601
Quality X U.O.	1	5.72	1.53	.219
Source X U.O.	1	.88	.23	.629
<u>3-Way Interaction</u>				
Quality X Source X U.O.	1	2.84	.76	.386

Table 1-8

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Pre-Exposure Issue Importance

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	3.35	.94	.335
Source	1	9.56	2.68	.105
Quality	1	2.96	.83	.364
Position	1	68.49	19.18	.000
<u>2-Way Interactions</u>				
Quality X Source	1	3.34	.94	.336
Quality X U.O.	1	.54	.15	.398
Quality X Position	1	6.32	1.77	.186
Source X U.O.	1	1.50	.42	.519
Source X Position	1	2.42	.68	.412
U.O. X Position	1	4.12	1.15	.285
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	7.34	2.06	.154
QualityXSourceXPosition	1	1.76	.49	.484
Quality X U.O. XPosition	1	6.11	1.71	.193
Source X U.O. X Position	1	.00	.00	.971
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	.48	.13	.716

Table 1-10

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),Source, Quality, and Position on Semantic Differential Aggregate

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	40.25	1.21	.274
Source	1	97.17	2.92	.090
Quality	1	62.40	1.87	.174
Position	1	87.97	2.64	.107
<u>2-Way Interactions</u>				
Quality X Source	1	44.77	1.34	.249
Quality X U.O.	1	.03	.00	.975
Quality X Position	1	2.71	.08	.776
Source X U.O.	1	34.53	1.04	.311
Source X Position	1	24.09	.72	.397
U.O. X Position	1	52.93	1.59	.210
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	2.08	.06	.803
QualityXSourceXPosition	1	14.52	.44	.510
Quality X U.O. XPosition	1	.60	.02	.894
Source X U.O. X Position	1	18.37	.55	.459
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	8.32	.25	.618

Table 1-11

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Reports of "Sure" on Position

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	12.74	3.87	.051
Source	1	2.77	.84	.361
Quality	1	1.00	.30	.583
Position	1	6.85	2.08	.152
<u>2-Way Interactions</u>				
Quality X Source	1	8.13	2.47	.119
Quality X U.O.	1	1.07	.32	.570
Quality X Position	1	2.09	.63	.428
Source X U.O.	1	.44	.13	.715
Source X Position	1	4.34	1.32	.253
U.O. X Position	1	.76	.23	.633
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	15.82	4.81	.030
QualityXSourceXPosition	1	23.59	7.17	.008
Quality X U.O. XPosition	1	10.97	3.33	.071
Source X U.O. X Position	1	.85	.26	.613
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	.55	.17	.683

Table 1-12

Examples of Thought-Listing Coding.

	Favourable	Unfavourable
Content-Related	"I think undergraduate examinations are a wise choice because it would put everyone from all universities on a level playing field when it came to applying for graduate programs"	"... for an undergraduate, adapting to university is hard enough without possible failure at the end"; "why should your future depend on one day".
Source-Related	"the delegate sounds like a trustworthy person..."; "... seemed like a strong person";	"the delegate seems like a moron"; "the speaker didn't seem to be very trustworthy"
Self-Related	"but after all, these exams may be in some point beneficial for me"; "... this will allow me to be prepared for what I may do in the following years".	"I wouldn't really like the idea of writing a comprehensive exam"; "At this point in time, exams are not my favourite thing".

Table 1-13

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Accurate Reference (Thought-Listing)

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	.62	.50	.481
Source	1	.04	.04	.853
Quality	1	3.76	3.02	.085
Position	1	1.42	1.14	.288
<u>2-Way Interactions</u>				
Quality X Source	1	2.22	1.78	.185
Quality X U.O.	1	2.34	1.87	.174
Quality X Position	1	3.99	3.20	.076
Source X U.O.	1	2.46	1.97	.163
Source X Position	1	.40	.32	.572
U.O. X Position	1	.02	.02	.902
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	2.16	1.73	.191
QualityXSourceXPosition	1	.20	.16	.693
Quality X U.O. XPosition	1	.98	.79	.376
Source X U.O. X Position	1	4.34	3.48	.065
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	9.67	7.76	.006

Table 1-14

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Total Number of Thoughts

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	21.80	3.37	.069
Source	1	.98	.15	.698
Quality	1	3.78	.59	.446
Position	1	.16	.03	.874
<u>2-Way Interactions</u>				
Quality X Source	1	6.78	1.05	.308
Quality X U.O.	1	1.12	.17	.678
Quality X Position	1	3.09	.48	.491
Source X U.O.	1	.11	.02	.897
Source X Position	1	3.12	.48	.489
U.O. X Position	1	1.77	.27	.602
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	.00	.00	.974
QualityXSourceXPosition	1	.26	.04	.842
Quality X U.O. XPosition	1	7.50	1.16	.284
Source X U.O. X Position	1	2.69	.42	.521
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	20.70	3.20	.076

Table 1-15

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Content-Related Thoughts (Positive – Negative)

Source of Variation	df	Mean Square	F	<u>P</u> of F
<u>Main Effects</u>				
U.O.	1	.17	.02	.888
Source	1	1.89	.22	.643
Quality	1	1.02	.18	.733
Position	1	34.95	3.99	.048
<u>2-Way Interactions</u>				
Quality X Source	1	.93	.11	.746
Quality X U.O.	1	8.97	1.02	.314
Quality X Position	1	1.84	.21	.647
Source X U.O.	1	.26	.03	.863
Source X Position	1	4.36	.50	.482
U.O. X Position	1	.07	.01	.929
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	2.77	.32	.575
QualityXSourceXPosition	1	.00	.00	.993
Quality X U.O. XPosition	1	.36	.04	.841
Source X U.O. X Position	1	9.77	1.12	.293
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	6.61	.75	.387

Table 1-16

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),Source, Quality, and Position on Source-Related Thoughts (Positive – Negative)

Source of Variation	df	Mean Square	F	P of F
<u>Main Effects</u>				
U.O.	1	21.56	2.98	.087
Source	1	.96	.13	.716
Quality	1	137.33	19.00	.000
Position	1	.27	.04	.848
<u>2-Way Interactions</u>				
Quality X Source	1	.34	.05	.829
Quality X U.O.	1	15.67	2.17	.144
Quality X Position	1	2.96	.41	.524
Source X U.O.	1	36.11	5.00	.027
Source X Position	1	64.39	8.91	.003
U.O. X Position	1	3.32	.46	.499
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	.66	.09	.763
Quality X Source X Position	1	2.49	.35	.558
Quality X U.O. X Position	1	.10	.01	.905
Source X U.O. X Position	1	.03	.01	.945
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	14.23	1.97	.163

Table 1-17

Analysis of Variance Summary for 4-way Interaction of Uncertainty Orientation (U.O.),
Source, Quality, and Position on Self-Related Thoughts (Positive – Negative)

Source of Variation	Df	Mean Square	F	P of F
<u>Main Effects</u>				
U.O.	1	.31	.87	.352
Source	1	.80	2.28	.134
Quality	1	.07	.20	.657
Position	1	1.35	3.82	.053
<u>2-Way Interactions</u>				
Quality X Source	1	.00	.00	.973
Quality X U.O.	1	.01	.03	.864
Quality X Position	1	2.54	.719	.008
Source X U.O.	1	.52	1.48	.226
Source X Position	1	.95	2.68	.104
U.O. X Position	1	.06	.16	.687
<u>3-Way Interactions</u>				
Quality X Source X U.O.	1	.18	.50	.483
QualityXSourceXPosition	1	.00	.02	.879
Quality X U.O. XPosition	1	1.91	5.41	.022
Source X U.O. X Position	1	.79	2.24	.137
<u>4-way Interaction</u>				
U.O. X Source X Quality X Position.	1	.05	.15	.697

Table 2-6

Analysis of Variance summary for 3-way interaction of Uncertainty Orientation (U.O.),
Categorization (Catn), and Task Uncertainty (Task-U.) on Change in Certainty Ratings

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	.00	.00	.954
Catn	1	7.20	3.49	.064
Task-U.	1	47.64	23.09	.000
<u>2-Way Interactions</u>				
U.O. X Catn	1	2.19	1.06	.305
U.O. X Task-U.	1	.22	.11	.744
Catn X Task-U.	1	.43	.21	.647
<u>3-Way Interaction</u>				
U.O. X Catn X Task-U.	1	.57	.28	.599

Table 2-8

Analysis of Variance summary for 3-way interaction of Uncertainty Orientation (U.O.),
Categorization (Catn), and Task Uncertainty (Task-U.) on Self-Esteem

Source of Variation	df	Mean Square	F	p of F
<u>Main Effects</u>				
U.O.	1	.48	.16	.689
Catn	1	2.34	.78	.379
Task-U.	1	10.42	3.46	.065
<u>2-Way Interactions</u>				
U.O. X Catn	1	8.79	2.93	.090
U.O. X Task-U.	1	1.27	.42	.516
Catn X Task-U.	1	.06	.02	.887
<u>3-Way Interaction</u>				
U.O. X Catn X Task-U.	1	6.57	2.18	.142