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Role of Opposition in Stereotyping

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TABLE OF CONTENTS

Appendix

LIST OF TABLES

CHAPTER I

INTRODUCTION

Traditionally, psychologists have approached the study of prejudice by focusing on stereotyping. Reflecting the general trend to seek explanations of social phenomena at the level of perception and cognition (see Fiske & Taylor, 1984), contemporary approaches to the issue have adopted cognitive categorization models to explain stereotyping (Billig, 1985). According to this perspective, stereotypes are considered to be cognitive structures (such as a schema or a prototype) encapsulating one's knowledge about a social group. As cognitive structures, stereotypes guide our perception and behavior toward the members of various social groups (Hamilton, 1979). As will be discussed below, the theoretical principles underlying both stereotype acquisition and its effect on subsequent cognition rely either on the associative processes or on the cognitive algebras involving assessments of similarity.

This dissertation intends to critically examine these basic assumptions of the postulated categorization processes with regard to the relationship between traits comprising in-group and out-group stereotypes. In part, the present inquiry is predicated on the observation that in many instances the relationships between traits present in alternative group stereotypes which are designated as different or incongruent, are in fact antonymical. For example, in the data collected by Katz and Braly (1933), several of the

more frequent traits in the Caucasians' stereotype of African-Americans (e.g., lazy) have their opposites in the stereotype of themselves (e.g., industrious). Judging from reasons offered by white participants either for or against desegregation presented by Schuller (1943) one may conclude that Whites saw themselves as clean and reliable whereas African-Americans were considered dirty and unreliable. Similarly, Campbell (1967), who argued that the most different traits will become a part of an out-group stereotype, presents an example of people of the North Dakota Hidatsa tribe who saw themselves as generous but their White neighbors as stingy.

Thus the question investigated by this dissertation is whether the appearance of opposite traits in respective in-group and out-group stereotypes suggests a particular property of the opposite meanings which distinguish them from other traits comprising the same stereotypes. Drawing on the research in cognitive psychology (Brewer & Lichenstein, 1975; Colombo & Williams, 1992; Glass, Holoyak and Kiger, 1979; Grossman & Eagle, 1976; Rychlak, Barnard, Williams & Wollman, 1988; Ulasevich & Rychlak, 1994; Vaughan, Sherif, O'Sullivan, Herrmann, & Weldon 1982) the general theoretical argument advanced here is that semantic opposionality is a unique relationship which simultaneously emphasizes the distinctiveness between meanings as well as their relatedness. As argued by Brewer and Lichtenstein (1975), an opposite of a word is the most likely alternative given to the negation of the word's meaning. It will be further argued that the constructs of semantic similarity, incongruence and strength of associative relationship are not sufficient to explain the empirical findings obtained by this research.

Research on stereotyping has not addressed the possible role of antonyms. For instance, Hamilton and Rose (1979) used an antonym of a stereotypical trait to define an incongruent trait, as did both Stern, Marrs, Millar, & Cole (1984) and Weber and Crocker, (1983). None of these studies acknowledged the oppositional relationship between items. However, there is some tentative evidence in this body of research to suggest that opposites may have had a unique effect on stereotyping. For instance, one of the three traits (ambitious) used by Dovidio, Evans and Tyler (1986) as typical of the white stereotype had an antonym (lazy) in the set of traits typical of the African-American stereotype. It was this trait that showed the greatest facilitation in the reaction time (RT) on a lexical decision task when it was primed by white (i.e., race-congruent condition) rather than by black (race-incongruent condition).

The intent of this dissertation will be to develop and test a model that can incorporate oppositionality into the process of social categorization and specifically stereotype acquisition. The general premise of this model is that oppositionality provides a cognitive organization which facilitates differentiation between in-group and out-group stereotypes, leading to the cognitive emphasis of the opposite traits in the respective stereotypes.

CHAPTER II

BACKGROUND AND SIGNIFICANCE

Oppositionality

Uniqueness of Antonymical Relationships The hypotheses to be tested hinge on the assertion that there exists a unique relationship between antonymical meanings, a relationship that will be referred to as oppositionality. The most compelling reason for asserting the existence of oppositionality as a specific construct is that models grounded either in the strength of association or similarity-based conceptualization of semantic processing cannot fully account for the paradoxical yet persistent results obtained from antonyms. Through an examination of these contradictory findings, the characteristics of the semantic relationship between antonyms will be proposed.

One of the earliest approaches to the conceptualization between words was strength of association. Associative strength was considered to be a measure of verbal habit, or an association formed as the result of frequent co-occurrence of particular words (Deese, 1962). The more contemporary network models (e.g., Collins & Loftus, 1975) make essentially the same assumption, except that these models elaborate on the construct of associative strength by representing the construct in terms of force or energy which travels through neural networks consisting of "nodes" that represent words such as "good" and "bad" and the connecting pathways. The strength of the relationship between

items thus depends on either the number of paths connecting two nodes, or in some versions of the network models the "conductivity" of the paths described in terms of thickness of the conduit (e.g., Wyer & Carlston 1979). The theoretical explanation of the effects of associative strength was assumed to be the tendency of one member of an associate pair to invoke another (Underwood, 1965), or in the metaphorical terminology of the network models to activate the corresponding node. For example, when one is cued with "good," "bad" would be the most likely response because of the a priori associative relationship.

This greater likelihood of one item to invoke or activate another would be expected to facilitate performance on the recall and recognition of paired associates. It would also lead to briefer latencies for verification tasks such as lexical decision tasks. On the other hand, the same mechanism in some cases would also interfere with performance. For example, the presentation of one member of a highly associated pair on a first list could lead a participant to incorrectly recognize its associate as the original item on the second test list (i.e., a false recognition effect [Underwood, 1965]). Also, pairing highly associated words with different target items on the same list (e.g., hot--AA cold--BB) could result in an associative interference where the target "BB" is recalled when primed with "hot" (Gough, Odom & Jenkins 1967; McCullers , 1965; Underwood, Ekstrand, & Keppel, 1965).

According to the normative ratings on association (Jenkins & Palermo, 1964) antonyms are usually highly associated. Thus, one would expect antonyms to show the same facilitatory and interference effects as any other highly associated item. In fact, one

may argue that this assertion was implicit in much of the research conducted under the auspices of the Verbal Learning models. The strength of association was considered to be the sole construct accounting for empirical effects; thus, these models often disregarded semantic designations such as antonymy or synonymy (Deese, 1962). A number of early studies included antonyms and synonyms in the experimental list of highly associated items (Gough Odom & Jenkins, 1967, McCullers, 1965, Thomson & Tulving, 1970), whereas the low association conditions did not have a discernable semantic relationship such as this.

However, in a series of studies Rychlak (1988) argued that associative strength in itself is not sufficient to account for the facilitatory effects to be noted in learning and memory. These studies compared participants' recall of antonym pairs with similarity associated synonyms and convergent associated pairs (e.g., cabbage-head). Typically, recall for antonyms was comparable to that for synonyms and significantly better than for convergent associates. Although Rychlak's argument advanced the notion that it was the semantic relationship which influenced the results, these findings in themselves do not invalidate the assumptions of the contemporary network models which unlike its predecessors also assume that semantic designations play a role in processing. For instance Colombo and Williams (1990) found that both highly associated antonyms and synonyms facilitate latencies on a lexical decision task. These authors also argued that there are more connections between antonym and synonym nodes than for convergent associates in a semantic network.

The more serious challenge to the associative models comes when one considers

the effect of antonyms on a task in which associative interference ought to interfere with performance. Although Underwood (1965) showed false recognition for antonym pairs, a result consistent with the strength of association models, Grossman and Eagle (1976) failed to obtain false recognition for antonyms, but did so for synonyms. Ulasevich and Rychlak (1994; experiment 2) obtained a lower rate of association errors for antonyms than for synonyms. In this experiment, participants were less likely to confuse which target term belonged with which cue item when cue items were antonyms. Like Grossman and Eagle, Ulasevich and Rychlak (1994) manipulated the associative strength between items, and did not show any main effects or interactions involving associative strength.

Grossman and Eagle (1976) attributed these findings to the difference in similarity between synonyms (considered as highly similar) and antonyms (considered least similar). The conceptualization of similarity offered by Grossman and Eagle relied on the feature-matching approach, similar to that advocated by Tversky (1977) where similarity is considered a function of the number of characteristics or features shared by two meanings minus the number of distinct features.

However, the literature in general notes congruence between the degree of similarity and associative strength in terms of the expected empirical effects. For instance, Rosch and Mervis (1975) note in their findings that the category membership of an exemplar most similar to the summary representation of a category (e.g., a robin is a bird) is verified faster than a more dissimilar exemplar (e.g., an ostrich is a bird) and can be accounted for by the associative strength between the category label and the exemplar

(see Underwood, 1965). The authors thus contended that similarity is the theoretical basis of associative strength. Similarly, the holographic models of semantic processing (e.g., Eich 1982; Murdoch 1982) translated empirical effects attributed to associative strength to semantic similarity between synonyms.

Accordingly, we would expect to find the facilitation effects attributed to associative strength discussed above for similar items such as synonyms but not for antonyms. This assumption is contradicted by the studies which showed similar facilitation effects for antonyms as for synonyms. Antonyms are thus an exception to the general principle of the congruence between similarity and associative strength. As a matter of fact, this point was made back in the 1960's when researchers were trying to establish the relationship between the strength of association and Osgood's (1952) semantic differential scale. For instance, Deburger and Donahue (1965) specifically excluded antonyms from the generalization of their results which showed a correspondence between the similarity of ratings on Osgood's semantic differential scale and associative strength. Pollio (1965) argued that logical opposites may signify a special case of associates which violate the principle of congruence between similarity and associative strength.

The findings obtained by Glass, Holyoak & Kiger (1979) have further challenged the similarity-based approach to antonymy. Using a sentence verification task, the latter researchers showed that participants correctly rejected anomalous sentences containing direct antonyms (e.g., All brothers are sisters) faster than anomalous sentences containing indirect antonyms (e.g., All brothers are aunts). In general, the latency of the correct

negative response on a sentence verification task is facilitated by the dissimilarity between the terms. However, the authors argued that the antonymical terms (e.g., brother and sister) could be considered to be more similar than indirect antonym pair (e.g., brother and aunt). Given that their results contradicted those which would be expected if the subjects' responses were simply based on similarity judgments, the authors concluded that people assess oppositionality of antonym pairs and not the similarity of their meanings. A similar assertion was made by Vaughan, Sherif, O'Sullivan, Herrmann, and Weldon (1982) who, based on their study of evoked cortical responses, concluded that the judgments of oppositionality are distinct from the assessment of similarity.

Incongruence is another construct used in the literature to designate distinctiveness between meanings. This is especially true in social cognition where incongruence is best defined as a judgment of the probability of co-occurrence of two traits within the same context (e.g., impression of an individual or a stereotype of a group). For example, given that we consider a person to be honest, we would consider it to be a very unlikely occurrence for that person to lie. It is further possible that semantic similarity is correlated with incongruence. Namely, we would not expect a very different trait to be a part of a coherent representation of a person or group.

As in the case with similarity, the construct of incongruence was also applied to antonymy. For instance, Hastie (1980) operationally defined his "highly incongruent" condition strictly in terms of antonyms. The author (Hastie 1980) argued that occurrence of such an unlikely event (e.g., an honest person lying) is psychologically salient and requires extra mental effort to reconcile. Following Hyde and Jenkins' (1973) depth of

processing model, Hastie proposed that this extra cognitive effort leads to the establishment of stronger associative links between the incongruent event and the representation of the person. Thus, as his data showed, the highly incongruent traits would be more likely to be recalled. In a sense, Hastie offers one possible explanation as to why antonymy violates the correlation between similarity and associative strength.

However, an argument can be made that Hastie's results are due to the semantic relationship between antonyms which defined his highly incongruent condition rather than due to simply the degree of incongruence and/or dissimilarity between items. Rychlak and Barnard (1993) challenged the depth of processing assumption adopted by Hastie. Their results showed that the recall for antonyms was better than for non-opposites, even though their task required more elaborate processing for non-opposites than opposites.

Additional arguments against the position that the relationship between antonyms is simply a high degree of incongruence can be gathered from the findings reported by Asch and Zukier (1984). The task presented to the participants in this study was to reconcile the incongruent description of an individual (e.g., a person who is both generous and vindictive or gloomy and cheerful). The dependent variable was the strategy used. The results presented suggest that the strategy used by the participants to reconcile the incongruent descriptions was systematically different for antonym pairs than for equally incongruent non-antonym pairs. For instance, one of the preferred strategies for a description consisting of the non-opposites "generous" and "vindictive" was an attempt by participants to explain how a person could exhibit both traits at the same time.

As reported by the authors, the typical response suggested that the particular person used generosity as the means toward the goal of his or her vindictiveness (i.e., means-end strategy as defined by authors). However, for the antonym pair *cheerful-gloomy* the preferred strategies seemed to involve showing that a person exhibits one of the traits depending on a situation. Furthermore, the most frequent strategy reported for this antonym pair was the only one which treated each trait as equal rather than designating one as being a more dominant one.

Oppositionality in antonymy Drawing on the research discussed above we may surmise several characteristics of the relationship between antonyms. Foremost, the meanings between antonymical words are related, although the nature of this relationship cannot be accounted for strictly by the association between word meanings. At the same time, the meanings convey distinctiveness that cannot be accounted for by a similarity and/or incongruence metric. In other words, antonyms are empirically distinct from dissimilar or incongruent meanings.

The construct of delimiting oppositionality advanced by Rychlak (1988, 1992, 1994) offers one explanation of the paradoxical findings discussed so far. The argument is that the meaning of a member of an opposite pair depends upon the other as something that the first meaning is not. For example, one's understanding of "honesty" involves the understanding of "honesty" as "not deceitfulness." Because of the relationship between meanings, an affirmation of one meaning in relation to a target (e.g., John is honest) involves the negation of the opposite (e.g., John is not deceitful). Thus cognitively both meanings are available simultaneously, which would account for the strength of

association between meanings noted above.

On the other hand, the distinctiveness between meanings implies that the negation of one meaning in relation to the target (e.g., John is not honest) implies that the opposite is likely to be true (e.g., John is deceitful). Thus, as demonstrated by Brewer and Lichenstein (1975), an opposite of a meaning is the most likely alternative to be mentioned given the negation of that meaning. For example, in their study participants recalled a sentence "Water is not cold" as "Water is hot," even though other logically plausible alternatives (e.g., warm, cool) were available. Similar conclusions can be drawn from findings obtained by Lutfig, (1982) reported in his study of schema normalization. In their recall of information, participants transformed presented false sentences such as Hitler liked Jews to Hitler hated Jews. Note that other possible schema-consistent transformations such as Hitler killed Jews were possible.

Models of Categorizations

Categorization-based models of stereotyping In a previous section, it was argued that the relationship between antonyms exhibit a unique relationship called oppositionality. To advance the arguments leading to the hypothesis proposed here, we must explore the possible role of oppositionality in stereotyping. As was noted in the Introduction, the literature on stereotyping adopted cognitive models of categorization to explain how stereotypes are constructed and how they influence subsequent cognitive processes.

There are two distinct categorization approaches to stereotyping in the literature: One adopted probabilistic modeling such as the prototype model (Rosch & Mervis, 1975) and one has its roots in the work of Tajefel and his associates (e.g., Self

Categorization Theory [Turner & Oakes, 1988]). According to Billig (1985), both of the contemporary categorization models owe their theoretical heritage to the work of the New Look psychologists. In contrast to the Adorno, Frenkel-Brunswik, Levinson and Sanford's (1950) thesis that individual's tendency toward prejudice is due to psychopathological factors, the causal explanation of stereotyping emphasized the nature of the process and the quality of the stimulus itself. As early as the 1950's Allport contended that the individual's propensity toward prejudice

> "lie(s) in his *normal and natural* tendency to form generalizations, concepts, categories, whose content represents an oversimplification of his world experience" (Allport, p.21, cited by Billig, 1985, emphasis added.)

Some thirty years later, Bodenhausen and Wyer (1985) noted that stereotyping was not due to "faulty processing."

The processes which underlie the heuristic properties of categorization involve constructing a summary representation of a potentially large class of instances. In the case of stereotypes, the summary representations are clusters of traits attributed to a particular group of people. The models discussed below differ in terms of the specific assumptions regarding how the summary representations are constructed.

Probabilistic Models One class of models adopted by researchers working on the topic of stereotyping is the Probabilistic approach, which includes prototype models (Rosch & Mervis, 1975) and exemplar models (Smith & Medin, 1981). The difference between the prototype and exemplar models is in the assumption regarding how categories are represented. The prototype model assumes a singular cognitive structure consisting of the most common features of category members. The exemplar models posit that categories

are represented by previous instances of the category. As argued by Medin (1989), exemplar models have several advantages over prototype models; specifically, they allow a person to encode the correlation between features (e.g., assumption that small birds are likely to fly whereas big birds are not).

The specific distinction between these models has generally been overlooked in research on stereotyping, with researchers leaning toward the prototype models. For instance, Evans and Tyler (1986) acknowledged that

> "While differing in important ways, these models agree that category processing is mediated by cognitive organization whether they are features, prototypes or in other models yet other types of organization" (p. 23).

Initially, Fiske and Taylor (1984) did not even address exemplar models, framing their discussion strictly in terms of prototype and schema models. In their later edition Fiske and Taylor (1994) did mention the exemplar models as well as their advantages, but noted that the research applying these models to social cognition is only beginning to trickle in. One may conclude that the actual model of categorization adopted by some social psychologists was a generic probabilistic model.

In general, research has emphasized the role of cognitive representation on subsequent cognitive processing. For instance, Dovidio, Evans and Tyler (1986) capitalized on typical findings of similarity-based models -- that more typical features are recognized faster -- to develop a method to establish the contents of out-group stereotypes, the expression of which might have been inhibited by social desirability. Rose and Hamilton (1980) argued that the expectation of typical characteristics of the group would lead to the overestimation of their frequency (i.e., illusionary correlation),

findings they used to account for perseverance of stereotypic beliefs. Lord, Tyler and Evans (1980) presented evidence that similarity of a group member (in their case homosexual men) to the summary representation increases the consistency between one's attitude toward the group and his or her behavior toward the group member. The summary conclusion of this research is that stereotype processing involves typicality judgements, or the comparison of attributes of a single exemplar to the attributes comprising the summary representation.

Like the research in cognitive psychology (see Mervis & Pani, 1980) the research on stereotyping emphasizes the processing being influenced by an already established cognitive representation. Rychlak (1988, 1992) argues that this empirical emphasis reflects a shift away from the learning model to the processing models which dominate the field. However, the question remains as to how the contents of the stereotypes came about in the first place. In regard to this point, Medin (1989) observes that the probabilistic models "do not say anything about why we have categories that we have" (p.1473). Medin's assertion is not exactly accurate. In the case of prototype models, the notion that the cognitive representation consists of the central tendency of the category in itself suggests a frequency-based mechanism underlying the abstraction process. The construction of the summary representation of a category is thus based on past experience with category members (Homa & Vosburg, 1976). Specifically, in the words of Elio and Anderson (1981), schema or prototypes "are patterns of frequently co-occurring features in a set of data" (p. 399).

Mervis and Pani (1980) presented a similar scenario. Namely, they argued that the

category structure depends on the type of exemplar presented during the acquisition stage. The authors defined "good" exemplars as those which possessed most of the attributes of other category members and very few of the "high frequency attributes of members of related categories" (Mervis & Pani, 1980, p. 497). The "bad" exemplars were defined as those which had few common characteristics with other category members and many attributes of the members of different categories. Their research suggested that the initial exposure to "good" exemplars leads to better learning of category structure. The exemplar models are more illusive in terms of the theoretical mechanism underlying the acquisition of category structure . Smith and Medin (1980) entertain the possibility that parents may in fact teach their offsprings the most representative instances of a category. One can easily assume that the most frequently encountered exemplars of a category may also serve to represent the category.

The categorization model, in which acquisition is based on the frequency and contiguity principles, implicitly or explicitly must assume that a person passively summarizes the information which is "out there" by capturing the patterns of co-occurrences between features (Brewer, 1988). Thus, whereas categorization may not be due to faulty cognitive processing, it may be the result of faulty information. The distortion of reality lies in the simplification of the information, more specifically in the loss of information resulting from the construction of the summary cognitive representation by the process which highlights the most commonly presented attributes and diminishes the importance of the less frequent characteristics.

In applying these general principles of categorization to stereotyping, we must

assume either that the groups in question actually possess the stereotypical traits, or that we were somehow misinformed. Attributes of stereotypes to media sources are one manifestation of this implicit theoretical position. For instance, by supplementing the frequency construct with that of salience of a trait due to its extremity, Rothbart, Fulero, Jensen, Howard and Birrel (1978) suggest that media influences our stereotypic beliefs thru repeated presentations of extreme behaviors by minority group members which "lead to an over-representation of extreme behaviors (e.g., murder) in our images of these groups" (p. 254). As these authors further suggest, we may note the frequency and contiguity assumptions in the theoretical explanations underlying the research on the out-group homogeneity effects (see Mullen & Hu, 1989). In general, these models attribute the more varied representation of the in-group to the more frequent encounters with the members of one's own group who exhibit different traits. On the other hand, the more homogeneous representations of the out-group are attributed to fewer encounters and thus lack of opportunity to observe a variety of traits (Quattrone & Jones, 1980).

One may argue that given these underlying assumptions, the theoretical sophistication of the explanations offered by the probabilistic models of how we acquire stereotypes has not really advanced far past the explanations offered by researchers working in the earlier descriptive tradition (e.g., Katz & Braly, 1933). These more contemporary models offer nothing to negate the assertion entertained by earlier research that stereotypes are images of social groups "transmitted across generation as a component of the accumulated knowledge of society" (Ehrlich, 1973, p.35).

Self Categorization Theory. The adequacy of the probabilistic models assumption that

the human cognitive process simply reflects the pattern of occurring features has been challenged by Brewer (1984) who cites a number of research findings which seem to support a different theoretical position. First, the covariation between stereotypic traits may be determined by the semantic relationship rather than simply their contiguity (Shweder & D'Andrade, 1980). Second, one's perception of trait frequency among members of either an in-group or an out-group may be influenced by psychological mechanisms other than the actual rate of their occurrence in the respective stereotype.

An alternative categorization-based model of stereotyping, the Self Categorization Theory (SCT) proposed by Turner and Oakes, 1988 considers both of these possibilities. The model itself evolved from the work of Tajefel and his associates on Social Identity Theory (SIT). Like the probabilistic models, this theoretical dynasty developed in turn from the work on perception, specifically that of Tajefel (1969). However, whereas in the case of probabilistic models, social psychologists essentially adopted the established cognitive models of stereotyping, the SIT was developed specifically to address the issues of stereotyping and group relationships involving both cognitive and motivational factors.

The original SIT model stipulated that stereotypes are constructed through two complementary processes -- categorization and social comparison. Categorization served as the cognitive mechanism of emphasizing the similarity within groups and distinctiveness between groups (Tajefel, 1969). Since the theory argued that an overriding force in social categorization was the maintenance of positive self-identity associated with group membership, social comparison served to select dimensions along which comparison was to proceed emphasizing the positive traits of in-group members

and negative attributes of the out-group (Turner, 1975). Thus Turner (1975) further argued that the differentiation between out-group and in-group stereotypes proceeds along mostly affective dimensions. In contrast to the probabilistic models where stereotypes consist of summary representations of the most typical features of respective groups acquired independently of each other, according to the SIT, the stereotypes of an in-group and an out-group represent a cognitive effort to simultaneously construct two highly distinct summary representations. Thus, the perceived similarity of the in-group and its distinctiveness with the out-group was considered to be the consequence of the categorization process itself (Billig & Tajefel, 1973; Tajefel & Billig, 1974). The distortion of reality afforded by stereotyping is not simply a matter of faulty information, but rather a matter of perceptual distortions which overemphasize distinctiveness regardless of the actual pattern of traits' occurrences.

Initially SCT was in agreement the position that categorization in itself biases social perception (see Hogg & Turner, 1987). However, latter SCT took a position more theoretically similar to that of the probabilistic models. For instance, Haslam and Turner (1992) argued that "accentuation of effects are not manifestations of distortions but rather reflect realities associated with altogether appropriate division of stereotyped stimuli into in-group and out-group categories" (p.254). Stereotyping is a judgement as to the degree a particular person shares one's own group characteristics. The judgement itself is influenced by factors such as the identity of the comparison group (see Turner & Oakes, 1988) or the social relationship between groups (Turner & Oakes, 1988, Haslam, Turner, Oakes, McGarty & Hayes, 1992; Spears & Manstead, 1988).

The definition of distinctiveness employed by SCT is theoretically closer to the construct of similarity understood in terms of dimensional scaling of meanings. Social comparison is essentially the same/different judgment made along relevant social dimensions (e.g., risky--not-risky, passive--active). The model is not clear in regards to the specification of the dimensions along which groups are differentiated, yet these dimensions seem to pertain to the identity of the groups compared.

Roles of oppositionality in stereotyping.

In developing a model of the possible role of oppositionality in stereotyping, it is necessary to consider both the characteristics of the oppositional meanings and the theoretical basis of the stereotyping itself. Opposition is a relationship between meanings. Thus, the basis of the process must consider the relationships between traits of alternative groups. The approach inherent in both SIT and SCT models fits this requirement better than the probabilistic models which tend to de-emphasize the relationship between traits.

The postulated role of oppositionality in stereotyping depends foremost on the assumption that the affirmation of one trait as typical of the in-group involves the affirmation that its opposite is not typical of an in-group. For example, the white subjects in the Katz and Braly's study might have affirmed industriousness as a characteristic of their own social group (e.g.," Whites are industrious"). The meaning of "industriousness" is logically delimited by its opposite "laziness" in the sense that someone who is industrious is not lazy. Thus, cognitively, the concept of laziness is also invoked in the stereotype by implication.

However, this trait is also the one which conveys a logical distinction from the

affirmed in-group trait. If the process of stereotyping involves a cognitive effort to maximize distinctions between the representations of the in-group and the out-group, then the task faced by the white students was to define a set of traits which would portray blacks as most unlike the whites. Thus, given the contrast conveyed by the opposites, the trait which is congruent with the goal of the process is already cognitively available. Furthermore, it can be argued that a simple strategy would be to assume that the out-group does not have the traits attributed to the in-group (e.g.. Blacks are not industrious). As argued above, the negation of the meaning implies the affirmation of its opposite. In this example, the assertion could have just as likely been that blacks are lazy. In a sense, the affirmation of one trait as typical of the in-group implies that its opposite is characteristic of the out-group.

Considering the bipolarity of the oppositional relationship, the reverse may also be true. The opposite of the trait affirmed as characteristic of the out-group may in fact characterize the in-group. If "they" are lazy, "we" must be industrious. In theory all arguments previously and subsequently framed in terms of in-group and out-group distinctions, where the in-group appears to be the starting point of the categorization process, apply to the alternative situations where the out-group may be the initial consideration in the stereotyping process. Although this is a legitimate research question in its own right, for the sake of parsimony, it will not be addressed further.

The possibility that oppositionality may be a factor in in-group/out-group differentiation challenges both the probabilistic and SIT/SCT approaches to stereotyping. First, an implication to the opposite is due to the intrinsic logical relationship between

meanings. Whereas this issue was addressed previously in contrast to the associative explanations of the relationship between opposite meanings, the pertinent issue in the context of stereotyping is the associative relationship between respective members of the opposite pairs and group labels. The model thus contends that the trait opposite to the in-group traits would be salient among the out-group members regardless of the association of a trait with the out-group label. In other words, any effects attributed to the oppositionality of meanings cannot be explained by the frequency a trait opposite to the in-group trait appears among the members of the out-group during the acquisition of the out-group stereotypes. Opposition provides a cognitive heuristic which may influence the perception of the frequency of traits that is not rooted in actual experience. In fact it is possible that people may surmise that a trait opposite to the salient in-group trait is characteristic of the out-group without factual evidence. If opposition is involved in stereotyping, we cannot consider stereotyping to be a process of capturing the patterns of traits' co-occurrences as the probabilistic models would contend is the case.

Furthermore, the effects noted above attributed to oppositionality cannot be accounted for solely by considering the degree of dissimilarity and/or incongruence between traits. Both incongruent and dissimilar traits would serve the goal of the process (i.e., creating a distinct summary representation) as well as antonyms. However, considering the cognitive salience of opposites due to their semantic relationship, this model posits that the opposite trait will be more likely to be used in construction of the out-group stereotype than the similarly incongruent and/or dissimilar traits. For example, given that a characteristic trait of an in-group is *honest*, its antonym, *decietful,* would be

more likely to be considered characteristic of the out-group than *selfish,* a trait which may be equally distinct, but not opposite.

This argument is fairly straightforward if we are to consider incongruence as the measure of distinctiveness. In case of similarity measures (conceptualized as a dimension scaling) further explanation is warranted. One may argue that opposites in fact anchor dimensions of meanings and, therefore, by definition have most semantically distant meanings. However, it is not necessary that the dimension defined by opposition is the relevant dimension in the comparison between two groups. For instance, if we are to consider Anderson's (1968) norms, the antonym pair *hostile* and *friendly* would have a similar degree of dissimilarity as the non antonym pair *hostile* and *honest* along an evaluative dimension. The similarity based metric proposed by the SCT would have problems accounting for any empirical differences between antonym and non-antonym pairs suggested here, unless we are to consider that opposition brings forth another dimension used in comparison (i.e., friendliness). It is not clear whether SCT makes this point explicit; however if we are to consider that the goal of the process is to maximize the difference between groups, this is possible. In other words, SCT would have to postulate that opposition in itself suggests a relevant dimension for comparison.

A more serious challenge to SCT (at least in its most recent formulation) is the suggestion made above that opposition may lead people to surmise that the trait opposite to the in-group trait actually comprises the out-group stereotype. In this case, the dimension of comparison is implicit since it is not revealed in the actually observed characteristics of in-group and out-group members.

Methodological approach

The model, specifying the role of opposition in stereotyping, suggests that opposition will influence the typicality of traits in the out-group stereotype. For instance, if *generous* comprises the in-group stereotype, *greedy* would be likely to be a salient characteristic of the out-group. Thus if we are to consider the possibility that oppositionality may be a heuristic in the differentiation of in-group and out-group stereotypes, any empirical effects attributed to oppositionality would be similar to those attributed to the typicality of particular traits.

To test the model presented here, the frequency estimates (i.e., participants' report of how many times a trait was presented in conjuction with a group label) were used as the dependent measure. Based on previous research, the magnitude of the estimates are influenced by the already established typicality of the traits (Hamilton & Rose, 1980) as well the actual frequency with which the traits are presented during a classification task (Rothbarts, Fulero, Jensen, Howard & Birrel 1978). The explanation offered by Rothbarts and his colleagues relied on the availability heuristic (Tversky & Kahneman, 1973). The authors argued that the increase in frequency of presentation results in the traits being more salient and thus more easily retrievable as the participants were making frequency judgments. For instance, if the number of times negative traits were presented was three times higher than positive traits, participants correctly reported that there were more unfavorable people on the list than favorable people. The correlation between the recall scores and the frequency judgments supported their conclusion.

Hamilton and Rose (1980) argued that the already stereotypical traits were more

readily accessible at the time when frequency judgments were made. In their study, participants over-estimated the number of times they had seen descriptions of salespeople being "loud" in comparison to them being "quiet." If we are to consider that the mechanism endorsed by the probabilistic model by which a trait becomes typical of a stereotype is based on the frequency of their occurrence, Hamilton and Rose's (1980) explanation of their findings is theoretically similar to that Rothbarts et al. (1978). Both assume a frequency based model of learning which in turn influences the availability of traits when frequency estimates are made. It follows, that in order to contrast the model of stereotyping based on opposition with the probabilistic approach it is neccessary to show that opposition affects typicality of traits regadless of the frequency with which opposite traits are presented during the time the stereotypes are aquired. Toward this end, the study described here manipulated the frequency of opposite and non-opposite traits for which participants made their frequency estimates.

The viability of the model proposed here also depends on demonstrating that the effects of opposition are independent from those effects that can be attributed to the distinctiveness between meanings. As noted above, distinctiveness is theoretically defined in terms of dissimilarity and incongruence. The fine distinction between the two constructs is that the former refers to the relationship between meanings whereas the latter captures the frequency of perceived or actual occurrences of the traits. Rosenberg and Sedlak (1972) argued that the understanding of distinction in terms of incongruence is more appropriate for social cognition. However, as noted above, Brewer (1988) argued that distinctions between meanings may play an equally important role.

For the purposes of this study, the distinctiveness between meanings was defined in terms of the difference in affective valence ratings obtained from Anderson's (1968) norms. The affective discrepancy in itself could be considered an important heuristic in social cognition. For instance, various scaling and clustering schemes discussed by Rosenberg and Sedlak (1972) generally include an evaluative dimension. Turner (1975) and Brewer (1988) argue that initially the classification of social stimuli proceeds along an affective dimension. According to Perdue, Dovidio, Gurtman and Tyler (1990) terms such as us and them which clearly indicate membership in opposing groups have acquired respective positive and negative affective markers. Thus, considering that a number of researchers conceptualize affect as a bipolar construct (Denier & Emmons, 1984; Warr, Barter, & Brownbridge, 1984), affect like semantic opposition would provide an equally heuristic cognitive structure to differentiate between groups. However, the studies on the effects of affective versus descriptive inconsistencies (e.g., Thomson, Raymond & Roman, 1994) have noted unique and orthogonal influences of descriptive inconsistencies. To address this issue, the experiment presented here varied the degree of affective distinction between specific traits of alternative group stereotypes.

The model proposed here also suggests that people may consider traits opposite of the in-group traits to be characteristic of the out-group even if individuals never observed these traits among the members of the out-group. Establishing whether individuals in fact surmise the typicality of traits based solely on the opposite relationship to the trait of the in-group stereotype would further advance the viability of this model. As described below in the procedure, this issue was addressed in a separate design.

CHAPTER III

EXPERIMENTAL METHODOLOGY

Overview

The methodological approach used in this design required participants learning stereotypes of two hypothetical groups. One of the groups was designated as the positive group. The positive group consisted of four highly positive and four affectively neutral traits. Two positive and two neutral traits were presented more frequently than other traits. The other group was designated as the negative group. The negative group consisted of four highly negative and four affectively neutral traits. Additional neutral traits were randomly assigned to each of the groups.

One trait in the negative group was always an antonym to one of the positive group traits (i.e., the opposite trait). In the High distinctiveness condition the antonym pair consisted of a highly positive trait and a highly negative trait (e.g., *generous--selfish*). In the Low distinctiveness condition, the antonym pair consisted of a neutral trait of the positive group and a neutral trait of the negative group (e.g., *talkative* and *quiet*). The frequency manipulation consisted of varying the number of times the antonym trait of the negative group was presented (either 6 or 2 times). One trait from the negative group had the same affective quality as the opposite trait presenented with the same frequency. This trait was designated as the non-opposite control trait.

Participants were first asked to classify each trait into one of the groups. Feedback regarding the correctness of classification was given immediately. Following this classification task, participants were asked to estimate the frequency with which the traits were presented. Although the participants made estimates for all traits presented during the classification task, the dependent variables were the frequency estimates for antonym traits in the negative group and its control trait.

Included in this list for the frequency task were traits which were not presented during the classification task. Two of these traits were highly negative and two traits were affectively neutral. One highly negative trait was an antonym to a highly positive trait in the positive group and one affectively neutral trait was an antonym to one of the neutral traits in the positve group.

Hypotheses

1) *After learning stereotypes of two groups, participants will estimate the prevalence of a negative antonym trait to be higher than the control non-opposite trait.*

Rational As was noted above, participants' estimates of frequency are based on the typicality of the trait. Oppositionality provides a cognitive organization which facilitates differentiation between stereotypes by emphasizing the contrast in terms of meaning conveyed by the antonym pair. Incongruent and similar traits do not have the same distinction in terms of meaning. If oppositionality does play a role in the process of group differentiation, it is then expected that the antonym of the reference group trait will be a more salient characteristic of the target group in comparison to the incongruent trait.

2) *Frequency estimates for non-opposite traits will be a function of frequency of traits'*

presentation. However, the estimates for opposite traits will not be influenced by the frequency of their presentation.

Rational. As argued above, opposite meanings delimit each other; that is, the meaning of one opposite intrinsically depends upon another as something that it is not. Based upon this principle it can be further argued that any time one member of an antonym pair is presented the opposite meaning is also invoked. In a sense, the presentation of one antonym involves a de facto presentation of another. Thus, the actual frequency of an opposite target group trait would not be an important factor. On the other hand, lacking the clear semantic relationship to the characteristics of the reference group, the typicality of the incongruent target group traits would be influenced by the frequency of their presentation.

3) *The frequency estimates of both opposite and control traits will be influenced by the affective distinctiveness of these traits with traits of the positive group.*

Rational Since the procedure calls on subjects to make a differentiation along an affective dimension, the highly negative traits will be more diagnostic of the group identity than affectively neutral traits. Therefore, participants should estimate the prevalence of highly negative traits to be higher than affectively neutral traits.

4) *Participants will estimate the frequency of opposite traits to be significantly higher than the frequency of the non-opposite traits when the non opposite trait is presented as often as the negative trait and its positive antonym.*

Rational This hypothesis represents another check against an alternative explanation which stipulates that antonyms affect the frequency estimates due to associatiative

relationship between them. The presentation of a positive trait may prime its negative antonym; in other words it may lead to implicit presentation of the negative antonym. This in turn would result in the greater exposure to negative antonyms and hence stronger association between the negative antonym and the negative group label. As was argued above, the heuristic properties attributed to opposition lie in the unique characteristic of their semantic relationship, namely that antonyms clearly convey distinctiveness between meanings. It is this relationship which non-antonyms lack. If this is the case, then when we equate the frequency of actual presentations of non-antonym negative traits with the explicit and implicit frequency of a negative trait opposite to the positive trait, antonym traits should lead to higher frequency estimates.

For example, assume that the trait *selfish* was actually presented two times (i.e., explicit presentation) during the classification task, while its antonym--*generous*--was presented four times. The assumption is that everytime *generous* is presented it primes *selfish* (i.e., results in implicit presentation of selfish). Therefore, the sum of explicit and implicit presentations for *selfish* would be six. To test this hypothesis, the frequency estimate for *selfish* would be compared to the frequency estimate for its control trait (e.g., *lazy*) when *lazy* is presented six times during the classification task.

5) *There will be a significant difference between the estimates of frequency for antonyms to high frequency-positive traits not presented during the classification task and frequency estimates of non-antonym traits which were not presented during the classification task.*

Rational The interdependence of opposite meanings is postulated to serve as heuristic

allowing participants to surmise that a particular characteristic is typical of the one group given that its opposite is typical of another group. On the other hand, the affective quality of the trait should also influence the frequency estimates since the more negative traits would be more diagnostic of the negative group.

Method

Participants: One hundred and sixty eight Loyola University Psychology 101 students were recruited for the study in exchange for course credit. Only native speakers of English were asked to participate.

Material: In order to test the hypotheses presented above, two hypothetical groups were created. The primary reason for using novel groups rather than established in-group and out-group stereotypes was to focus on the dynamics of the cognitive process as it is influenced by the semantic, distinctiveness and frequency factors. The use of novel groups affords more control over these variables and also prevents social desirability bias which is expected to influence performance on the less subliminal task used here. The additional advantage of avoiding the in-group/out-group dichotomy is that it eliminates the factors pertaining to inter-group relationships which may either accentuate or diminish the perceived distinctiveness between groups.

One group consisted of affectively positive characteristics and affectively neutral characteristics whereas the other group consisted of affectively negative and affectively neutral characteristics. In order to operationally define the degree of affective valence conveyed by each trait, Anderson's (1968) list of likability ratings was divided into fifths. The highly positive traits for the positive group were selected from the first fifth

(likability rating of 5.73 to 4.55) and the highly negative traits for the negative group stereotype were selected from the last fifth of the list (ratings of 1.0 to .26). The affectively neutral traits of both positive and negative group traits were selected from the third or middle fifth of the list (ratings of 3.58 to 2.19). The traits with a minimally higher rating was designated as the positive group traits. This division of the list approximates the four subranges suggested by Anderson (1968) (i.e., H [5 to 5.45] M+ [3.45 to 3.74] M- [2.22 to 2.54] and L [.72 to 1]), but these subranges were not used because they greatly restricted the choice of traits necessary for this study.

Several additional criteria were applied when selecting the traits. First, compound words (e.g., loudmouthed) were excluded from consideration as were the words derived by modification of the root (e.g., insincere). Second, the meaningfulness of the words (i.e., its familiarity rating reported by Anderson [1968]) was also considered in the selection. Unless absolutely necessary, the words with ratings lower than 3.50 were not considered. Exceptions were anticipated among the words in the middle range of the list which tend to be less familiar over all (Anderson, 1968). The pool of the positive, negative and neutral traits were checked for similarity of meaning using Funk and Wagnall's International Dictionary of English Language (Funk & Wagnall, 1987).

In all 22 traits were selected using these procedure. The list of traits contained two antonym pairs consisting of highly negative and highly positive traits and two antonym pairs consisting of two neutral traits. The antonymy of these traits was confirmed by the same dictionary (Funk & Wagnall, 1987).

To control for any idiosynchratic trait effects, an identical procedure was used to

generate a second list of traits (i.e., list 2). An additional 16 traits for each experimental list were selected from the middle fifth of Anderson's (1968) norms to serve as filler items. These were necessary to make the experimental task more involved thus masking the experimental hypotheses. The filler traits did not have any semantic relationships to any of the previously selected traits and were identical for both lists.

Following this procedure the following traits were selected for the positive group on the list 1 (likability ratings are in parentheses): *Honest* (5.55); *Generous* (5.19); *Understanding* (5.11) and *Responsible* (5.04). *Honest* and *Generous* were designated as the stereotypic traits, meaning that these were presented more often during the classification task than *Understanding and Responsible*. This was done to increase their typicality among other traits of the positive group. In addition, two affectively neutral traits: *Talkative* (3.52) and *Bold* (3.36) were selected as stereotypic traits of the Positive group. *Persistent* (3.47) and *Proud* (3.58) completed the list of positive group traits (see Table 1).

On list 2, *Ambitious* (4.59) and *Polite* (4.89) were selected as stereotypic, highly positive traits. *Aggressive* (3.04) and *Skeptical* (2.62) defined the neutral stereotypic traits Two other positive traits (*Intelligent* [5.37] and *Reliable* [5.27]) and two neutral traits (*Perfectionist* [3.17] and *Excitable* [3.17]) were also included (see Table 2).

The experimental manipulation of the Distinctiveness (high vs. low) factor was achieved by altering the composition of the negative groups. Furthermore the operational definition of the Type of trait factor (i.e., opposite vs. control) depended on the level of Distinctiveness factor. The Distinctiveness factor was manipulated between subjects,

and each group of participants saw only one antonym pair among the traits comprising the negative and positive groups.

In the High distinctiveness condition, the opposite trait was a negative antonym to one of the stereotypic, highly positive traits. The control trait was a negative group trait which had a similarly negative affective valence as the opposite trait. For instance, *Selfish* with the affective rating of .91 (an antonym of *Generous*) defined the opposionality condition in the High distinctiveness conditions on list 1 and *Lazy* (1.26) was its control trait. Resultantly, the magnitude of affective difference between opposite and control traits and the highly positive traits in the positive group was sufficiently high. *Hostile* (.91), and *Irritating* (1.18) were the other two highly negative traits included in the list. Four neutral traits: *Restless* (2.74) *Dependent* (2.54) , *Impulsive* (3.07) and *Lonesome* (2.74) completed the list of negative group traits in the High distinctiveness condition.

In the Low distinctiveness condition, the opposite trait in the High distinctivenes condition (i.e., *Selfish)* was substituted with an equally negative trait--*Boring* (.97). On the other hand, the neutral trait *Quiet* (3.11), an antonym to *Talkative* (a neutral stereotypic trait of the positive group) , was included in the list in the place of *Lonesome*. *Quiet* thus defined the opposite trait, and *Restless* was designated as the control trait. The magnitude of difference between the affective ratings of opposite and control traits of the negative group and the neutral stereotypic traits of the positive group was negligible. The traits of the negative group in the Low distinctiveness condition were thus as follows: *Boring, Lazy, Hostile*, *Irritating* , *Quiet, Restless Dependent* , and *Impulsive*.

Table 1 presents the complete set of traits used for List 1. Similar procedures were used to construct a set of traits for negative groups for List 2. These traits are presented in Table 2.

The filler items were added to the list at the time the procedure was administered. Eight traits were randomly assigned to the positive group and eight traits were randomly assigned to the negative group. This resulted in a list consisting of 32 traits (16 per group) to be administered in the procedure.

Each trait comprising the positive and negative groups was randomly paired with a trigram. Trigram-trait pairs which began with the same letter were avoided. The three letter combinations of the trigram were randomly generated, but the randomization algorithm avoided creating duplicate trigrams. Since, the trigrams allegedly represented a person's initials, uncommon letters such as X Y and Z were not used. Furthermore, to minimize the overall familiarity of the trigrams, those corresponding to common abbreviations were deleted. To emphasize that the trigrams ought to represent a person's initials, periods were inserted. Each trigram trait combination was presented as a sentence (e.g., "W.E.C. IS SELFISH."). With each presentation of a trait, that trait was paired with a different trigram.

To test hypothesis five, another set of traits was selected to be used only during the estimation task (i.e., when participants made their frequency estimates). For each experimental list, the set of traits consisted of antonyms to the positive and neutral stereotypic traits , and two traits of similar affective quality. The semantic relation between these traits and positive group traits defined the levels of the Type of trait factor

(opposite vs. control). The degree of affective discrepancy between antonym and control traits and the respective positive group traits defined the levels of Distinctiveness factor. For example on list 1, an antonym to *Honest, Deceitful* (.26), defined the Opposition condition in the High distinctiveness condition. *Rude* (.76) was the control trait. The antonym of *Bold --Cautious* (3.34)--was an opposite trait in the Low distinctiveness condition and *Perfectionist* (3.22) served as its control trait. The sets of these traits for list 1 and list 2 are presented in Tables 1 and 2 respectively.

Procedure. Participants were tested individually. Each individual was randomly assigned to one of the cells of the experimental design as defined by the list used and the level of frequency and distinctiveness factors and as well as the set of stimuli material used.

Color labels "Blue" and "Green" were used to label the groups in the procedure. For half of the participants in each cell of the design, "Blue" designated the positive group and "Green" designated the negative group, whereas for the other half, "Green" designated the positive group and "Blue" designated the negative group.

The task material was presented on a computer screen. Each presentation consisted of trigram-trait pair and which was shown simultaneously for 2 sec. There was a 5 sec. delay between presentations, during which participants were asked to indicate which group the person described by the trait belonged to. Participants were given feedback regarding the correctness of their classification decision immediately after they entered their response or after 5 sec. had expired (see Appendix A for instructions to the participants).

Table 1

Experimental List # 1

Positive Group Trait	Affective Rating	Meaning fullness Rating	Negative Group Trait	Affective Rating	Meaning fullness Rating	Δ
Substitute Trait for Selfish in Low distinctveness conditon: Boring (.96)						
Generous	5.19	384	**Selfish**	.82	384	4.37
Honest	5.55	379	**Lazy**	1.26	372	4.29
Understanding	5.11	350	Hostile	.91	380	4.20
Responsible	5.04	370	Irritating	1.18	372	3.86
Substitute Trait for Quiet in High distinctiveness condition: Lonesome (2.74)						
Talkative	3.52	390	***Quiet***	3.11	376	0.41
Bold	3.36	366	**Restless**	3.07	380	0.29
Persistent	3.47	382	Dependent	2.54	360	0.93
Proud	3.58	368	Impulsive	3.07	362	0.51

Traits Presented During the Frequency Estimation Task Only:
High Distinctiveness Antonym: *Deceitful* (.26) High Distinctiveness Control: *Rude* (.76)
Low Distinctiveness Antonym: *Cautious* (3.34) Low Distinctiveness Control: *Perfectionist* (3.22)

Note: Affective rating refers to Likability scores reported by Anderson
Δ refers to the difference in affective ratings between positive and negative traits.

Table 2
Experimental List # 2

Positive Trait	Affective Rating	Meaning fullness Rating	Negative Trait	Affective Rating	Meaning fullness Rating	Δ
Substitute trait for Rude in Low distinctiveness condition: Conceited (.74)						
Ambitious	4.59	370	***Phony***	.27	374	4.32
Polite	4.89	368	***Rude***	.76	356	4.13
Intelligent	5.37	368	Gloomy	1.36	376	4.01
Reliable	5.27	374	Jealous	1.04	372	4.23
Substitute trait for Submissive in High distinctiveness condition: Forgetful (2.24)						
Aggressive	3.04	372	Submissive	2.19	376	0.85
Skeptical	2.62	348	*Indecisive*	2.19	366	0.43
Perfectionist	3.22	380	Frivolous	2.37	314	0.85
Excitable	3.17	366	Troubled	2.35	360	0.82

Traits Presented During the Frequency Estimation Task Only:
High Distinctiveness Antonym: Lazy (1.26) High Distinctiveness Control Selfish (.82)
Low Distinctiveness Antonym: ***Gullible***(2.19) Low Distinctiveness Control Crafty (2.23)

Note: Affective rating refers to Likability scores reported by Anderson
Δ refers to the difference in affective ratings between positive and negative traits.

The frequency with which the antonym trait and the control traits were presented during the classification task defined the levels of Frequency of presentation factor. This factor was manipulated between subjects. In the High frequency conditions, the antonym trait and the control trait were presented 6 times. The other two traits with the same affective rating as the antonym and control traits were presented twice. Two traits of different affective rating were presented six times and two traits of different affective rating were presented twice. All filler items were also presented twice.

For example, in the High frequency/High distinctiveness condition for list 1 *selfish* (the opposite trait) and its control trait *lazy* were presented 6 times each whereas *hostile* and *irritating* were presented twice each. The affectively neutral traits--*restless* (a trait designated as control trait for *quiet* in the Low distinctiveness condition) and *lonesome* (a trait used to substitute for *quiet*) were presented 6 times and the remaining affectively neutral traits (*dependent* and *impulsive*) were presented twice.

In the Low frequency condition, the opposite trait and the control trait were presented two times. The remaining two traits of the same affective rating as the antonym and the control traits were presented six times. As was the case before, two traits of the different affective valence were presented six times and the other two traits of different affective valence were presented twice. For example, in the Low frequency/High distinctiveness condition, *selfish* and *lazy* were presented twice, whereas *hostile* and *irritating* were presented six times each each. The frequency of presentation for affectively neutral traits was the same as above. The complete list of frequency of presentation for each trait in each of the experimental conditions for list 1 are presented

in Table 3.

Thus, regardless of the frequency manipulation, for each negative group, the highly negative traits were presented 16 times. The affectively neutral traits were also presented 16 times as were the filler items. In all, the traits comprising the negative group were presented 48 times during the classification task.

The frequency with which the traits of the positive group were presented did not differ across experimental conditions. The highly negative and neutral traits designated as stereotypical of the group were presented four times each. The remaining traits and the filler traits were presented twice. In all, the traits of the positive group were presented 40 times.

The reason why stereotypical traits of the positive group were presented four times was to set up the comparison necessary to test hypothesis 4. Note that in the Low frequency condition, the opposite was presented twice and its positive group antonym was presented four times, resulting in six explicit and implicit presentations. On the other hand, in the High frequency condition, the control trait was presented six times, the same number of times as the sum of explicit and implicit presentation of an opposite trait in the Low frequency condition.

The frequency estimation task followed next. A list containing all traits presented during the classification task, as well as four additional (never before shown) traits were presented to the participants. Participants were asked to estimate the number of people in the "Green" and in the "Blue" group who were described by that trait (see Appendix B for the instructions given to participants). The order of trait presentation

was random as was the order of which group (Blue or Green) participants were asked to make their estimates first. Participants were asked to complete their estimate for each trait as quickly as possible by entering their response on a keyboard.

In all, participants made two frequency estimates--one for the negative group and one for the positive group-- for all the traits presented during the estimation task. The reason for asking participants to estimate the frequency of a trait in both groups was due to a methodological consideration. The pilot test of the procedure revealed that if the participants were asked to make frequency estimates for the negative group only, they seemed to rely on the affective ratings of the traits rather than any other considerations. By asking the participants to provide estimates for both groups, participants would have to consider first which group the trait belonged to. Resultantly, the cognitive representation of both groups would become salient. This is important considering that the Distinctiveness and Type of trait factors are defined in terms of the relationship between traits of both groups. However, the hypotheses stated above made predictions regarding the influence of the independent variables on the typicality of the opposite and control traits (both negative group traits) in the negative group. Thus, the primary dependent variables entered into analyses were the frequency estimates of the opposite and control traits in the negative group .

No hypotheses were made regarding the frequency estimates of traits in the positive group. The characteristics of the positive groups were not manipulated systematically. Therefore, the frequency estimates of positive traits were not considered further.

To test hypothesis 5, the dependent variables were defined by frequency estimates for the negative group of the traits which were not presented during the classification task. Traits with the opposite relationship to the traits in the positive group defined the Opposition level of the Type of trait factor, whereas the traits with no semantic relationships with the traits in the positive group defined the control level of the same factor. As noted above, the degree of affective distinctiveness between the opposite trait and its antonym trait in the positive group defined the levels of the Distinctiveness factor. Each Participant made frequency estimates for traits corresponding to all levels of Type of trait and Distinctiveness factors.

To obtain a manipulation check on whether participants considered groups to be positive or negative, participants were asked to rate each group on a seven point Likert-type scale. To insure that participants knew the meaning of the traits used, they were asked to define each trait used on the experimental lists. These tasks always followed the frequency estimation task.

Table 3
Frequency of Presentation for Traits from List 1

Positive Group Trait	HF/ HD	LF/ HD	HF/ LD	LF/ LD
Honest (4)	**Lazy** (6)	**Lazy** (2)	Lazy (6)	Lazy (6)
Generous (4)	***Selfish*** (6)	***Selfish*** (2)	*Boring (6)*	*Boring (6)*
Bold (4)	Restless (6)	Restless (6)	**Restless** (6)	**Restless** (2)
Talkative (4)	*Lonesome* (6)	*Lonesome* (6)	***Quiet (6)***	***Quiet (2)***
Understanding (2)	Hostile (2)	Hostile (6)	Hostile (2)	Hostile (2)
Reliable (2)	Irritating (2)	Irritating (6)	Irritating (2)	Irritating (2)
Persistent (2)	Dependent (2)	Dependent (2)	Dependent (2)	Dependent (6)
Proud (2)	Impulsive (2)	Impulsive (2)	Impulsive (2)	Impulsive (6)

The antonym traits are in ***italic bold***, and comparison traits are in **bold**
Substitute traits are in *italic*.

HD: High distinctiveness LD: Low distinctiveness
HF: High frequency LF: Low frequency

CHAPTER IV

RESULTS

In conducting statistical analyses, SPSS for Windows was used for all analyses of variance and SAS 6.01 was used for non-parametric statistics. The interactions were probed using the algorithms described by Levine (1991). First, an outlier analysis was performed on participants' estimates of frequency . The standard deviation for all frequency estimates for the negative group (i.e., both antonyms and control words) was calculated. The data for seven participants whose scores for either the antonyms or control words were three or more standard deviations above the grand mean for the sample were removed from further analyses. This left 161 participants in the sample.

Initially, to test hypotheses 1, 2, and 3, participants responses were entered into a 2 between (list) X 2 between (distinctiveness) X 2 between (frequency of presentation) X 2 within (type of word) repeated measures analysis of variance (ANOVA). The list factor was entered to see whether the effects of independent variables predicted by these hypotheses were mediated by the idiosynchratic characteristics of the traits themselves. Since the list factor did not show a main effect, nor any interactions, it was omitted from further consideration. Subsequently, the scores were entered into a 2 between (distinctiveness) X 2 between (frequency) X 2 within (type of trait) repeated measures ANOVA. As one may recall, hypothesis 1 predicted that the frequency estimates for

opposite traits will be higher that those for the control traits. Hypothesis 2 predicted that the frequency factor will influence the frequency estimates for the control traits but not for opposite traits. Hypothesis 3 predicted that the frequency estimates in the High distinction condition would be higher than frequency estimates in the Low distinction condition. The analysis yielded a significant main effect for type of word ($F[1,157]=22.99$, $p<.001$) as well as significant distinctiveness by type of word interaction ($F[1,157=50.27$, $p<.001$) . There was also a significant main effect for frequency ($F[1,157]=17.86$, $p<.001$) and significant distinctiveness by frequency interaction. Contrary to the prediction made by hypothesis 2, there was only a trend for the Distinctiveness factor ($F[1,157]=3.33$, $p>.07$). ($F[1,157]=4.91$, $p=.028$). The summary ANOVA table is presented in Table 4.

The probe of the distinctiveness by type of trait interactions revealed a significant simple main effect for the Type of trait factor in the High distinctiveness condition ($F[1,159]=69.78$, $p<.001$). As anticipated by hypothesis 1, participants estimated the frequency of antonyms to be higher than frequency of non-antonyms ($x_{antonym}=6.92$ [S.D.=4.43] vs. $x_{control}=3.64$ [S.D=3.02]). However contrary to this hypothesis, in the Low distinctiveness condition, there was no significant difference between estimated frequency for antonyms and control traits ($F[1,159]=2.71$, $p=.102$).

The probe of the distinctiveness by frequency interaction showed a significant simple main effect of frequency in the low distinctiveness condition ($F[1,158]=20.84$, $p<.001$). The estimates for traits in the High frequency condition (6 presentations) were higher than estimates for traits in Low frequency condition (2 presentations) (x_{high}

Table 4

ANOVA summary table for the analysis of main hypothesis

Source of Variance	Sum of Squares	Degrees of Freedom	Mean Square	F value	p	Eta Sqrd.
Between Subjects Effects						
Error	3144.35	157	20.09			
Distinctiveness	66.89	1	66.89	3.33	.070	.021
Frequency	358.8	1	358.8	17.86	.0001	.102
Distinctiveness X Frequency	98.58	1	98.58	4.91	.028	.030
Within Subjects Effects						
Error	963.75	157	6.14			
Type of Trait	141.13	1	141.13	22.99	.0001	.128
Distinctiveness X Type of Trait	308.57	1	308.57	50.27	.0001	.243
Frequency X Type of Trait	.34	1	.34	.06	.813	0.00
Distinctiveness X Frequency X Type of Trait	3.31	1	3.31	.54	.464	.003

$_{frequency}$=5.96 [S.D.=3.61] vs. $x_{low\ frequency}$=2.74 [S.D.=1.91]). There were no significant effects for frequency in high distinctiveness condition (F[1,158]=2.1, p=.150).

This frequency by distinctiveness interaction was not anticipated by the hypotheses made here. However, hypothesis 3 stipulated the effect of the frequency factor for non-opposites. This raised an issue of whether participants percieved the opposite traits in the Low frequency condition as opposite in meaning to the traits of the positive group. To conduct this manipulation check on the Type of trait factor, three raters were asked to decide whether the definitions provided by participants for antonym pairs used in the experiment conveyed opposite meanings. A simple Yes/No scoring scheme was used. The definitions were considered oppositional when at least two raters agreed that they were. Since not all participants had an opportunity to provide definitions, the sample consisted of 104 participants.

The first analysis compared the frequency of opposite versus non opposite definitions contingent on the level of the distinctiveness factor. The analysis of the contingency table revealed a significant chi square (X^2=26.74, df=1, p=.001). For the high distinctiveness traits, 93 out of 104 (89.4%) participants provided oppositional meaning. On the other hand, for low distinctiveness antonyms 60 out of 104 participants (57.8%) provided definitions which conveyed oppositionality. Furthermore, the frequency of opposite meanings for low distinctiveness traits differed as a function of the list used (X^2=5.67, df=1, p=017). Participants were more likely to provide opposite definitions for traits on list 1 (36 out of 52 [69.2%]) than on list 2 (24 out of 52 [46.2%]).

In addition, the frequency of oppositional and non-oppositional definitions for low distinctiveness traits were compared between participants in the low distinctiveness condition (i.e., those who were exposed to both traits in antonym pairs during the classification and estimation task) and those in the high distinctiveness condition (i.e., those who were exposed to only the positive member of the antonym pair during the experimental tasks). The analysis showed that the participants in the high distinctiveness condition were as likely to indicate non-oppositional meaning as those in low distinctiveness condition.

In order to test directly whether the perception of opposite relationship influenced the frequency estimates, scores of participants in the low distinctiveness condition were entered into a 2 between (Perception of Opposition) X 2 between (List) X 2 within (Type of Trait) repeated measures ANOVA. The analysis yielded no main effects or interactions. However, the univariate analyses showed that the perception of opposition factor had a marginal effect on the frequency of estimates of opposite traits ($F[1,48]=3.62$ $p<.06$; $x_{perceived}=4.79$ [S.D.=3.06] $x_{not\ perceived}=3.18$ [S.D.=2.84]).

To test whether implicit presentations of antonyms influenced the results (Hypothesis 4), the scores of subjects in the Low frequency/Opposite trait condition were compared to the scores of participants in the High frequency/Control trait condition. These groups defined a between-subjects type of word factor. Of course, it should be noted that the frequency of presentation was always confounded with the type of trait. List and distinctiveness were control factors. The scores were entered into a 2 between (type of word)X 2 between (list) X 2 between (distinctiveness) ANOVA. The analysis

yielded only a significant Type of trait by Distinctiveness interaction. (F [1,157]=24.27, $p<$ 0.0001). The probe of the interaction revealed that consistant with the prediction made by hypothesis 4, in the High distinctiveness condition, participants gave significantly higher estimates for antonyms than non-antonyms ($x_{antonyms}$=6.47 [S.D= 4.67] vs.$x_{control}$=4.19 [S.D.= 3.31]; F[1,158]=6.24, $p<$.013). However, contrary to the prediction in the Low distinctiveness condition, the opposite was true: participants gave higher estimates for non-antonyms (which were presented 6 times) than for antonyms (which were presented twice) (; $x_{antonyms}$=2.29 [S.D.= 2.22] vs. $x_{control}$=6.15 [S.D.= 5.00]; F[1,158]=19.28, $p<$.001).

To test the hypothesis that participants will estimate the frequency of antonyms for positive group traits not presented during the classification task to be higher than words of similar affective valence (Hypothesis 5), participants scores were entered into 2 between (list) X 2 within (distinctiveness) X 2 within (type of trait) repeated measures ANOVA. As one may recall, all participants gave estimates for both levels of the distinctiveness factor. The analysis revealed a significant main effect for the distinctiveness factor (F[1,156]=24.91, $p<$.001). There were also significant distinctiveness by type of trait (F[1,156] =17.38, $p<$.001) and distinctiveness by list (F[1,156]=5.16, p=.024) interactions.

The probe of the distinctiveness by list interaction showed that participants tended to have lower estimates for low distinctiveness traits on List 2 than on List 1 (x_{list2}=1.17 [S.D.=1.65] vs. x_{list1}=1.66 [S.D.=2.76]; F[1,156]=1.81, p=.18). The means for high distinctiveness traits did not differ signficantly.

The probe of the distinctiveness by type of trait interaction indicated that contrary to the prediction made by hypothesis, for highly distinct traits, participants made higher estimates for non-antonyms than antonyms ($x_{opposite}$= 2.05 [S.D.=3.32] vs. $x_{control}$=2.87 [S.D.=4.09] ; F[1,156]=8.07, p<.005). However, consistent with the hypothesis, in the low distinctiveness condition, the pattern of results was reversed. Participants estimated the frequency of antonyms to be higher than non-antonyms (F[1,156]=6.63, p<.011; $x_{opposite}$= 1.69 [S.D.=3.07] vs. $_{control}$= 1.14 [S.D.=2.16]).

Since, the distribution of scores was heavily skewed, to further investigate the effects of distinctiveness and type of trait on participants' estimates of words not presented during the classification task, the participants' scores were dichotimized so that any score other than zero was re-coded as having a value of one. Considering that the actual frequency of presentation was zero, the score of zero thus indicates an accurate response.

Comparison of participants' scores for highly distinct antonym and control traits revealed that participants were more likely to make accurate estimates (i.e., indicate that a trait was not presented) for antonyms than for control traits (antonyms: 54.4% vs. Control 37.3%; X^2=9.291, df=1, p<.002). On the other hand, opposite findings were revealed by the comparison of participants' scores for low distinctiveness traits. Here, participants were more likely to make accurate estimates for control traits than for antonym traits (control: 66.5% vs. Antonyms: 55%; X^2=4.3, df=1, p=.038). Looking at the frequencies, it is clear that the rate of correct estimates for antonyms did not vary between distinctiveness conditions (54.4 % for high and 55% for low, X^2<1). On the

other hand, the rate of accurate estimates for control traits was higher for low distinctiveness traits. (Low distinctiveness control: 66.5 vs. High distinctiveness control: 37.3; X^2=26.82, df=1, p<.001).

However, the data also indicate that the list factor might have mediated the accuracy of estimates for high distinctiveness traits. For instance, the comparison of frequencies of accurate estimates between high distinctiveness control and antonym traits in list 1 showed only a trend (control: 46.3%; antonym: 57.5%, X^2=2.03, df=1, p=.15). On the other hand, a significant effect was obtained for the comparison between high distinctiveness antonyms and control traits in list 2 (control: 28.2% vs. antonyms 51.3 %, X^2=8.673, df=1, p=.003). The analysis of low distinctiveness antonym and control traits revealed a similarly strong trend in both list conditions. The significance comparison between the traits reported previously is probably due to the increase in power when frequencies were collapsed between lists.

CHAPTER V

DISCUSSION

General findings

As was argued above, semantic opposition is instrumental in providing a cognitive structure to facilitate differentiation of groups by providing a likely alternative to an attributed meaning when it is negated. For example, according to this model as participants learn that the trait *generous* is typical of one group there is an implicit understanding that some other group does not posses this trait . The meaning of *generous* is thus negated in relation to the other group (i.e., the other group is not generous). Because the meanings of antonyms delimit each other in the sense that one is defined as the absence of the other, the antonym of the negative meaning would be the most salient alternative, and thus is likely to be considered as typical of that other group. It was further argued above that other dimensions along which groups may be differentiated -- in the case of this study the affective discrepancy-- would not detract from the main prediction. Even though equally affectively distinctive control traits would,in theory, be as diagnostic of group membership as antonyms, the semantic relationship between antonym traits would be used as a primary heuristic in differentiating the groups. For example, given that members of the in-group consider themselves to be industrious, the members of the out-group are more likely to be

considered lazy than selfish. The effect of antonyms was thus expected in both levels of the affective discrepancy factor (Hypothesis 3). Furthermore, it was predicted that frequency of presentation would not be a factor affecting the frequency estimates for antonyms (Hypothesis 2).

The results support the key tenets of this model but limit its applicability to the highly distinctive antonyms. As predicted by hypothesis 1, participants estimated the frequency of antonym traits to be higher than the frequency of non-antonym traits , but did so only in the high distinctiveness condition. This simple main effect can be attributed to the semantic relationship between traits. The data allow us to rule out plausible alternative explanations. For instance, the list was not a significant factor, thus the obtained results cannot be explained by the tendency of particular traits to be estimated higher than other traits. There were also no effects of the frequency factor in the high distinctiveness condition. The estimates for opposites were equally high, regardless of the frequency of their presentation. Furthermore, the effect of antonyms does appear to be solely due to an associative priming effect. When the explicit and implicit (i.e., being primed by the positive group antonym) frequencies of presentation of antonyms were equated with the explicit presentation frequency of non-antonyms, the frequency estimates for antonyms were still higher. However, consistent with the results above, this was the case only in the High distinctiveness condition.

The affective distinction is not sufficient in itself to explain the findings. If the affective distinctiveness was the only relevant factor, we would obtain a main effect and no interaction with the Type of trait factor. However, when the affective distinctiveness

was similarly high, participants estimated the frequency of antonyms to be higher than that of non-antonyms. In addition, in the High distinctiveness condition, the magnitude of the difference between estimates for negative and positive groups was higher for antonyms than for control traits, suggesting a more precise differentiation between groups afforded by antonyms.

The most parsimonious explanation as to why the effect of antonyms was limited to the high distinctiveness condition is that participants did not perceive the meaning of the negative group antonym traits defining the Low distinctiveness condition to be opposite in meaning to the respective positive group traits. The ratings of whether participants perceived the meanings of the key traits to be opposites clearly indicates that whereas almost 90 percent of participants considered the antonym traits used to define the High distinctiveness condition to be opposites, only about 58 percent of participants considered the traits used to define the Low distinctiveness condition as such. The above percentages did not differ among participants who were exposed to the traits during the experimental task and those who were not. This issue involved what appears to be some intrinsic ambiguity of meaning rather than a result of the experimental procedure.

If, due to the ambiguity of meanings, participants in the Low distinctiveness conditions did not perceive the opposite meaning of the traits, then they did not use oppositionality as a heuristic. It would follow that there would not likely be a systematic difference between antonym and control traits. The observed frequency by distinctiveness interaction is consistent with this explanation. Whereas frequency was not a factor in the High distinctiveness condition, where participants used opposition as a

heuristic, frequency *was* a factor in the absence of opposition. This suggests that another cognitive strategy was used. For instance, participants might have tried to associate each trait with its appropriate category label; a task that would be sensitive to frequency manipulation. This pattern of results is consistent with the assumption that frequency of presentation influences the availability of a trait in memory, which in turn leads to higher estimations (Tversky & Kahenman 1973).

Although the possibility that participants did not perceive opposition in the Low distinctiveness condition could account for the obtained results, the data did not unequivocally support or reject this hypothesis. The participants who did perceive opposition in the Low distinctiveness condition did not necessarily estimate the frequency of antonym traits to be higher than that of control traits. The univariate analysis on the other hand suggested that the perception of antonyms did lead to somewhat higher estimates for antonyms. However the effect was weak, possibly due to the low power of this analysis. Furthermore, the participants presented with list 1 were more likely to provide more oppositional definitions than participants presented with list 2. If the perception of antonyms directly impacts on the comparison between antonym and control traits, we would have expected an interaction of distinctiveness and type of trait factors with the list factor on the initial analysis (i.e., one which considered the list factor).

There was stronger evidence for the hypothesis that the observed type of trait by distinctiveness interaction was due to participants' failure to perceive opposition between antonym traits in the low distinctiveness condition based on the analysis of the difference scores. The differences between positive and negative group scores were larger for

control traits than antonym traits among participants who did not perceive the opposition of antonym traits. However, among the participants who reported opposition, the difference scores did not differ. In fact, the average difference for antonym traits was larger than for control traits. The pattern of results is somewhat peculiar in the sense that perception of opposition brought the difference scores for antonyms up to par with those for the controls. It is therefore possible that control traits served the function of differentiating the groups somewhat better than antonym traits, unless the opposition between the latter was noted.

The discussion so far focused on the potential problem of participants perceiving the opposition of the low distinctiveness traits. There is another aspect of the stimulus that must be considered, namely the role of affective distinctiveness in influencing the results obtained here. On the one hand, we cannot discount a possibility that the high-distinctiveness antonyms were somehow more oppositional than low-distinctiveness antonyms due to the affective discrepancy. This assumption is consistent with the position of Hermann, Chaffin, Peters and Conti (1979). These authors propose that processing of antonyms involves apprehension of several dimensions on which meanings are differentiated. The degree of opposition is a function of the number of these dimensions. The observed effect of opposition in the high distinctiveness condition is due to the added effect of the affective discrepancy. Perhaps it was easier to acknowledge opposition among these traits. Furthermore, since figuratively there is not enough opposition among low distinctiveness traits, participants were less likely to acknowledge the relationship and therefore to not use opposition of these traits to

differentiate the groups.

This hypothesis would explain why the opposition of the high distinctiveness antonym traits was more likely to be perceived . However, even when the low distinctiveness antonyms were seen as opposites, the average magnitude of the frequency estimates was still below that of the high distinctiveness antonyms. It appears that even when the relationship was acknowledged, there was a ceiling effect for the frequency estimates of the low distinctiveness antonyms. This suggests that affective distinctiveness in influences the overall frequency estimates (this issue which will be addressed further below).

Whereas the previous two explanations stressed the intrinsic qualities of the traits (i.e., variability of meaning and degree of opposition), another possible explanation of the obtained results is that opposition plays a heuristic role only when it is relevant to or diagnostic of the identity of the groups. It is clear from the participants' ratings that they considered a group described by negative traits to be overall more negative than a group described by positive traits. From these data, one assumes that participants were essentially creating two categories, that of good people and that of bad people. The high-distinctiveness traits are most diagnostic of these two categories, whereas the low-distinctiveness traits could be considered less relevant. The presence of highly negative antonyms did not influence these ratings. With high-distinctiveness traits, the decision regarding classification into "good" versus "bad" categories is fairly easy, since the affective distinction is easily established.

Affirmation of any trait as a positive group trait implies that it is not a negative

group trait. Thus, the first step in the process of differentiation-- the negation of meaning in relation to the other group-- is initiated. Antonym meanings are thus implied as the most likely alternative. The cognitive focus is thus on the relationship between traits and the participants capitalizing on the opposition to clearly differentiate two groups. Given the importance of opposites in the process, the opposite traits were more salient in memory, leading to an illusionary correlation phenomenon reported here.

On the other hand, the traits defining the Low distinctiveness condition may have been irrelevant to the identity of the groups. For instance *talkativeness*, lacking clear affective valence, might have been considered a probable characteristic of either group. Thus, the negation of meaning in relation to a particular group might not have occurred. However, since the participants were required to categorize individuals described by these traits, the low-distinctiveness traits were relevant to the classification task itself. As noted above, in the low distinctiveness condition the frequency estimates were influenced by the frequency with which traits were presented. In the context of the diagnosticity hypothesis, the absence of the effect for opposition in the low distinctiveness condition suggests that the cognitive focus might have been more likely on the relationship of a trait to a group label rather than on the relationship between traits themselves . Therefore, as was suggested before, a different cognitive strategy (perhaps one based simply on rote learning) was used to accomplish the categorization task.

The diagnosticity hypothesis is not inconsistent with the findings that the tendency toIdefine antonym traits oppositionally varied between distinctiveness conditions. It suggests a possible reason as to why distinctiveness influenced frequency

estimates. Although we cannot dismiss an assumption that the meanings of the low distinctiveness antonyms are more variable, we can assume that since the opposition of the meanings was not helpful in differentiating the group stereotypes it was not perceived or reported. Assuming that each trait in low distinctiveness antonym pairs had several meanings, and only one or two respective meanings would jointly comprise an opposite pair, there was no cognitive impetus to settle upon these specific meanings. It would follow that, even if participants in the two list conditions differed in terms of whether they reported the opposite meanings, this issue did not impact on the estimates of the frequency, as indicated by the lack of list factor effects and interactions on the omnibus ANOVA.

It was noted above that the exposure to antonyms on the experimental task did not seem to influence the propensity of participants to define antonym traits oppositionally. But we cannot rule out that the task might have influenced the definitions offered by the participants. The definition task always followed the classification and estimation tasks, as well as the affective ratings of the groups. It is therefore possible that given affective distinctions emphasized in the classification task and subsequently by the rating task, the oppositionality of highly distinctive antonyms again became salient. The potential oppositionality of low distinctiveness traits on the other hand were still not relevant. Given that the opposition of meanings was irrelevant, participants who were exposed to the antonym meanings in the low distinctiveness condition were no more likely to state opposite meaning than those who were not.

Although the proposed diagnosticity hypothesis suggests that the key element is

the relevance of the antonym traits to the group identity, we still cannot discount the fact that the obtained effect was due specifically to the affective distinction of the traits . There is no way to methodologically disentangle the relevance of the group identity and the affective distinctiveness of the traits. Since the ratings of groups as positive or negative were not influenced by whether participants saw affective distinct antonyms during the classification task, it is clear that opposition in itself did not determine the group's affective identity. What remains unclear is whether the obtained affects (i.e., influence of opposition among high distinctiveness traits and lack of its effect for low distinctiveness traits) hold only under conditions of affective differentiation, or whether effects of opposition may be obtained under different conditions. The resolution of this issue necessitates further research. Specifically, for the diagnosticity hypothesis to be viable, it would be necessary to duplicate the effect reported here with the groups not necessarily differentiated in terms of affective distinction.

Another aspect of the findings should be addressed here. Contrary to the prediction made by hypothesis 2, the frequency of presentation did not influence the frequency estimates for the control traits. Rather, there was an interaction between distinctiveness and frequency where frequency of presentation influenced the frequency estimates for both low distinctiveness antonym and control traits. Interestingly, the frequency of presentation did not influence the frequency estimates for high distinctiveness control traits. These findings indicate the power of opposition as a heuristic in differentiating the groups. It appears when one of the traits had a clear opposition relationship, the typicality of the control trait presented with the same

frequency was diminished. In fact, when an antonym trait was presented substantially less frequently, the frequency estimate was still higher than that for a control trait presented with higher frequency. Although the specific explanations of the data reported here warrant further research, the results strongly support the general hypothesis that opposition plays a role in stereotyping.

Findings for traits not presented during the classification task.

The model of stereotyping proposed here further suggests that opposition may play a role even when both opposite traits are not presented during the classification task. Namely, it was argued that the presentation of one trait will imply that its opposite is characteristic of the other group, even if that trait is not presented. Hypothesis 5 predicted that the frequency estimates for opposites of positive group traits not presented during the classification task would be higher than frequency estimates for traits of similar affective valence, also not presented during the task.

Looking strictly at the means, the results contradicted this hypothesis for highly negative traits and supported it for traits in the middle range of affective valence. Namely, the estimates for highly distinct antonyms were consistently lower than estimates for control words, whereas the opposite was true for low- distinctiveness antonyms. However, it is also apparent that the rate of estimates for antonyms did not differ between distinctiveness conditions. Rather, the frequency estimates for control traits differed. Participants made high estimates for highly negative control traits and low estimates for traits in the middle range.

Since the distribution of scores in these analyses were highly skewed, they were

dichotomized. The zero estimates were retained as such and any non-zero estimates were re-coded as a value of one. Since the actual frequency of presentation was zero, the zero score thus signifies an accurate estimate and the score of one indicates an inaccurate estimate. The non-parametric analyses revealed a similar pattern of results as the analysis of variance. The frequency of accurate estimates was almost identical in both conditions (roughly 55%) . On the other hand, the accuracy for highly negative controls was significantly less than for antonyms and the accuracy for low-distinctiveness traits was significantly higher. The frequencies for high- distinctiveness control traits did differ as a function of the list, but the direction was consistent.

The data suggests that participants relied on the affective valence of the control traits in making their estimates. This could be another indication that negative traits in general were seen as more typical of the negative group. Since the traits were not presented prior to the estimation task, this further suggests that the magnitude of participants' estimates cannot be attributed solely to availability of the trait in memory . Rather, at least some of the variance in the frequency estimates can be explained by a decision- making process which considers the likelihood that the trait is typical of a category based on its affective quality. Since all participants were exposed to both neutral and highly negative as well as highly positive traits, it is not clear whether there is a general tendency to consider the highly negative traits to be typical of a group and to de-emphasize the importance of neutral traits, or whether there is a contrast effect between neutral and affectively distinct traits.

The above points have implications for the interpretation of the distinctiveness by

type of trait interaction for the frequency estimates of the traits presented during the classification task. As was noted above, among participants who reported oppositional relationships between low-distinctiveness antonyms, there were indications that opposition might have been a factor, although the effects did not reach the acceptable level of significance. If there is a propensity to give higher estimates for highly negative traits than for more neutral traits regardless of whether these traits were actually presented, this tendency might have resulted in the previously mentioned ceiling effect for low- distinctiveness antonyms which could have masked the effect of opposition . One resolution would be to use a measure of typicality such as reaction time which is less sensitive to post-access decision- making processes.

If the model of opposition advanced here is correct, we would expect an implicit memory trace for an opposite trait. As argued above, the meaning of opposites are interdependent, so that affirming of one meaning intrinsically implies its opposite. If this is the case, then some participants made estimates based on implicit memory for the opposite trait. Considering that roughly half of the participants reported non-zero estimates for antonym traits, the memory trace might have been weak.

On the other hand, the results may indicate the noted failure of antonyms to produce a false recognition effect (see Grossman & Eagle, 1976 discussed above). The antonym meanings might have been available during the estimation task, but also information that they have not been seen. The issue here may be attention. Specifically, when the positive trait is presented, its antonym meaning also becomes available for the reasons discussed above. This would set up an expectation that the opposite trait should

comprise the list of characteristics of the negative group. However, in the case of traits not presented during the task, this expectation is not fulfilled. Therefore, participants would be aware that the trait was not presented leading to the accurate response (i.e., zero estimate). Since, the meanings are distinct and mutually exclusive, there is little probability of mistaking one antonym meaning for its opposite. False positives would be due to the uncertainty that the negative trait was not presented. The presentation of both traits during the estimation task might have contributed to the rate of false positives.

General discussion and implications of findings.

The previous sections discussed the specific findings of the study and offered plausible explanations of the obtained results and some ways to empirically test them. However, it was also noted that in general, the findings support the hypothesis that semantic opposition is heuristic in the process of differentiating group stereotypes. With this emphasis on the relationship between traits of alternative groups, the model supported here is theoretically closer to the British tradition advanced by Tajefel and his associates.

The model advanced here provides evidence for the suggestion made by Brewer (1988) that individuals use semantic relationships between traits in constructing stereotypes. By specifying the trait which is likely to be considered to be a part of an out-group stereotype, given that a particular meaning is affirmed in relationship to the in-group, the model elaborates on the understanding of differentiation between the in-group and out-group stereotypes. The goal of maximizing the difference between the out-group and the in-group is met, but in addition opposition conveys a stronger sense of

distinctiveness by specifying mutually exclusive characteristics. At least one prediction suggested by this analysis is that groups differentiated oppositionally should differ from groups differentiated by non-opposites in terms of perceived exclusivity of the members. For instance, there should be less likelihood that a member of an out-group would be considered to be a member of the in-group if the respective stereotypes contain opposite traits than if they do not.

The model based on opposition is not necessarily inconsistent with the body of research which suggests the role of either affective discrepancy or extreme behaviors in determining the contents of the out-group stereotypes. For instance, Perdue, Dovidio, Gurtman and Tyler (1990) argued that terms used to refer to in-groups and out-groups-- us and them-- have associated positive and negative qualities respectively. Turner (1975) suggested that the differentiation between in-group and out-group stereotypes proceeds along an affective dimension.

The findings of this experiment suggest that affective distinction is only part of the story. According to the data presented here the trait opposite to the trait in the in-group is more likely to comprise the stereotype of the out-group than an equally affectively negative trait which does not have an oppositional relationship. Even if the initial differentiation is primarily affective, opposition may further differentiate the categories by specifying a more precise contrast between the two. Not only do we learn that one group is good and the other is bad, but also that one is generous and the other is selfish. In other words, opposites define what is good and what is bad about each group.

The results of this study also showed that the effect of opposition supersedes that of frequency of presentation. As such, the findings presented here contradict one of the fundamental assumptions of the probabilistic models as applied to stereotyping --namely, that the contents of stereotypes are determined chiefly by the frequency by which traits appear in association with the group label. It was demonstrated that not only did frequency of presentation not influence the frequency estimates for opposite traits nor the comparison between opposites and controls, but when the low-frequency antonym was compared to the high-frequency control trait, the frequency estimates of the latter were still higher. These findings strongly suggest that, as argued by Brewer (1988), stereotyping is not simply observance of patterns of co-occurrences of traits presented to individuals. Hence stereotyping is not just a matter of faulty information presented about a particular out- groups. It also involves a cognitive tendency to emphasize the importance of traits opposite to the characteristic traits of the in-group regardless of how frequent that trait is.

However, the study does not negate the frequency thesis completely. Frequency of presentation was a factor influencing the estimates of frequency when opposition was not. It is therefore possible that individuals do use information regarding how often a trait appears in conjunction with a group label, but only when opposition does not influence their perception of a trait's relevance to a stereotype.

The obvious question is whether the presence of a clearly identifiable oppositional relationship among the traits of respective stereotypes is sufficient to diminish the effect of frequency, or whether there are other constraints on the use of opposition as a

hueristic. On one hand, we may consider opposition as a cognitive bias which necessarily influences the typicality of the trait as long as it is acknowledged. This would be similar to the position taken by some researchers who consider the typicality of negative traits in an out-group stereotype to be a result of a similar cognitive bias (Rothbard et al., 1978) .

However, opposition may also be considered a heuristic strategy. If this is the case, then there might be specific factors influencing whether the heuristic strategy is employed. For instance, certain factors pertaining to intra-group relationships, such as competition or threat to one's group's dominant social status, have been shown to lead to more negative out-group stereotypes (Haslan, et al., 1992; Spears & Manstead, 1989). These social determinants of the relationships between groups may also affect the propensity of individuals to rely on opposition in constructing out-group stereotypes. For instance, according to Karlins, Coffman, and Walters' (1969) replication of Katz and Braly's (1933) study, the number of traits comprising the black stereotype which were opposite to the traits comprising the white stereotype decreased in 1968 in comparison to 1933, as the relationship between groups supposedly improved.

Similarly, attitudinal factors such as the degree of one's prejudice toward the out-group may also influence whether an individual relies on opposition to differentiate between the in-group and out-group stereotypes. For instance, Adorno et al. (1950) reported that highly prejudiced individuals tend to form categories based on opposite characteristics. Although, it is not necessary to accept Adorno et al.'s (1950) major thesis that prejudice and thus oppositional categorization are symptoms of a personality

disorder, the observation does suggest a greater use of opposition in differentiating stereotypes corresponding to a greater degree of negative affect toward the group. The group relations or attitudinal factors may demand a more extreme or mutually exclusive differentiation between groups, the type of differentiation afforded by opposites. Furthermore, the influence of these factors may be through their influence on the identity of the groups. For instance, competition may initially call for the differentiation along a positive to negative dimension. The effect of opposition would thus be contingent on whether the opposite traits are diagnostic of the group identity (see above).

Empirically, the question may be framed in terms of whether the presence of clearly recognized oppositional traits in the information presented about the out-group (i.e., the way it was done in this experiment) is sufficient to elicit the use of oppositional traits in stereotype construction, or whether the manipulation of either group relationships or attitude toward the out-group constrains the use of opposition. Furthermore, if the negative group relationship or attitude factors have an effect on opposition through determining the initial affective differentiation, the manipulation of these factors should lead to the use of opposition only when the opposite traits are consistent with the group identity. For example, the distinction between honesty and decietfulness may be important to the identity of thieves and non-thieves, whereas the distinction in terms of equally affective distinctive traits such as generosity and selfishness may not be that important.

The test of the model suggested here involves measuring the effect of opposition on the typicality of the traits, using one specific measure. Obviously, the results of the

study should be tested using other measures of typicality, such as reaction time for falsifying or affirming the meaning of the sentences containing exemplars and category labels (e.g., Rosch & Mervis, 1975). Furthermore, it would be important to test whether opposition affects other cognitive processes attributed to stereotyping (Hamilton, 1979), especially attention. The demonstrated influence of opposition on attention will help to further explain why relatively infrequent opposite traits are considered to be more typical than more frequent non-opposite traits.

In addition, the model should be tested using different type of experimental stimuli. One shortcoming of the method used here is that it employed minimal stimuli (i.e., personality traits), which might have increased the probability of perceiving the oppositional relationship. To increase its external validity of the model, the stimulus set consisting of behavioral descriptions (e.g., Stern, Marrs, Millar, & Cole 1984) should probably be used.

The question of whether individuals may surmise that opposite traits are typical of the out-group has not been answered conclusively. There does appear to be some effect due to opposition of traits, but the nature of this effect remains unexplained. At least one of the problems may be that the dependent measure used here is theoretically dependent on the availability of trait in memory and as noted above, there may be different factors influencing whether the non-presented oppositional trait is salient in memory. It was also noted above that other measures may be more sensitive to the influence of non-presented traits than the frequency estimates collected here.

The resolution of the issue of whether opposition leads individuals to surmise that

opposite traits are characteristics of the group is extremely important to the validity of the model of the whole. This ability to surmise frees us from the sole reliance on the information presented about the out-group. The thesis that social categorization is essentially a matter of distorting social reality suggested by Tajefel and Billig (1973) becomes more viable.

One issue not addressed by this dissertation was the role of opposition on the typicality of the positive group traits. If the meaning of opposites is truely interdependent, than we should observe similar effects for the positive traits and as we did for the negative traits. However, the broader question may be whether we are as likely to learn something about ourselves based on the characteristics of the out-group, as we are likely to learn something about the out-group based upon what we know about ourselves. The answer to this question may lay in the more precise understanding of the cognitive processes underlying the in-group and out-group differentiation. Namely, one possibility endorsed by the SIT and SCT models is that the contents of the in-group and out-group stereotypes are determined simultataneously. In other words, we learn that their group is *selfish* and our group is *generous* at the same time. If this is the case, both members of an opposite pair would be salient, leading to increased typicality for both opposite traits in their respective stereotypes.

On the other hand, the in-group stereotype may serve as a base from which we either learn or surmise the characteristics of the out-group. In this sense, the characteristics of the out-group are determined or inferred based on the comparison to the existing representation of the in-group stereotype. For instance, we may conside our

group to be *generous*, *honest*, and *industrious*. If we are presented with evidence that the out-group is *selfish* and *boring*, *selfishness* would still be a more typical trait of the outgroup than *boring* given it oppositional relationship to *generous*. However, the typicality of *generous* may not be affected because the typicality of *generous* is already entrenched in our knowledge of our own group along with other key traits.

In conclusion, the study presented here adds to the understanding of stereotyping by demonstrating an effect of oppositionality on the perceived typicality of traits. Specifically, the traits of the stereotype of the negative group were more typical than the non-opposite traits of equally high negative valence. As such, the study reveals the importance of the semantic relationship in the process of stereotyping. Furthermore suggests that the relationship between of the meaning of the traits in the in-group and the out-group stereotypes may be a more important factor than frequency of a traits presentation. Although a number of important questions remains unanswered and a number of issues will need to be addressed empirically to further test the application of the model, the results of this study strongly suggest that further research on the role of oppositionality in stereotyping will be beneficial to expand our knowledge of social cognition.

APPENDIX A

EXPERIMENTAL INSTRUCTIONS FOR THE CLASSIFACTION TASK

DURING THE FIRST PART OF THIS EXPERIMENT YOU WILL BE ASKED TO TO LEARN ABOUT TWO GROUPS OF PEOPLE: THE BLUE GROUP OR THE BLUES AND THE GREEN GROUP OR THE GREENS. THE NAMES OF THE GROUPS HAVE NO SIGNIFICANCE; THEY WERE CHOSEN AT RANDOM AMONG OTHER COLORS.

DURING THE TASK YOU WILL BE PRESENTED WITH SENTENCES SUCH AS:

W.E.C.
IS HAPPY

THE INITIALS ARE ALSO FICTIONAL AND WERE GENERATED AT RANDOM; THEY ARE UNIQUE TO EVERY INDIVIDUAL. THE WORD DESCRIBING AN INDIVIDUAL IS YOUR CLUE TO WHICH GROUP THAT PERSON BELONGS. THE SENTENCE WILL BE ON THE SCREEN FOR 2 SECONDS.

YOUR TASK IS TO DECIDE TO WHICH GROUP A PERSON BELONGS. A PROMPT ASKING YOU TO ENTER YOUR CLASSIFICATION DECISION WILL APPEAR AFTER 2 SECONDS:

PLEASE ENTER YOUR CLASSIFICATION DECISION
ENTER B FOR BLUE GROUP
ENTER G FOR GREEN GROUP

WE ASK YOU TO ENTER EITHER LETTER G FOR GREEN GROUP OR LETTER OR B LETTER FOR BLUE GROUP. YOU WILL HAVE 5 SEC. TO DO SO, BUT PLEASE MAKE YOUR DECISIONS AS FAST AS POSSIBLE.

DO NOT WORRY IF AT FIRST YOU HAVE NO IDEA TO WHICH GROUP A

PERSON BELONGS. THE COMPUTER WILL TELL YOU IF YOU WERE RIGHT OR WRONG.

MORE INSTRUCTIONS WILL FOLLOW ONCE YOU FINISH WITH THIS TASK

APPENDIX B

INSTRUCTIONS FOR THE FREQUENCY ESTIMATION TASK

At this time, you will see a trait presented on the screen.Your task is to estimate the number of people who were described 'by that trait in each of the groups: the Green group and the Blue 'group. Please follow the prompts on the screen and please note that sometimes you will be asked to make estimates for the Blue'group first and at other times you will be asked to make estimates'for the Green group first To make your estimates, simply type the number at the cursor. Please make your estimates as quick as possible.

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The final copies have been examined by the director of the dissertation and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the dissertation is now given final approval by the committee with reference to content and form.

The dissertation is therefore accepted in partial fulfillment of the requirments for the degree of Doctor of Philosophy.

April 4, 1997 — Date

Joseph F. Rychlak — Director's Signature