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The influence of spatial groupings on consumer decisions

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THE INFLUENCE OF SPATIAL GROUPINGS ON CONSUMER DECISIONS

by

Arul Mishra

An Abstract

Of a thesis submitted in partial fulfillment
of the requirements for the Doctor of
Philosophy degree in Business Administration
in the Graduate College of
The University of Iowa

May 2007

Thesis Supervisor: Assistant Professor Dhananjay Nayakankuppam

ABSTRACT

In everyday life, we often encounter groupings of objects. It could be a group of products kept on a retail shelf, food items in a shop window or depictions of groups of objects or people in an advertisement. However, very little attention has been paid to how these different groupings could influence consumer decisions. The main aim of this article is to study the influence of such groupings on consumer choice and behavior.

A new phenomenon is presented that studies the influence of gestalt grouping of objects, such as economy, symmetry, and similarity in different consumer decision domains. Specifically, it is proposed that when each object in two groups has an equal chance of a gain (for instance, one in 10 has a gift coupon), then people prefer to select an object from the group with better gestalt features. However, when each object in two groups has an equal chance of a loss (for instance, one in 10 is defective), then people prefer to select an object from the group with worse gestalt features. Normative theory would predict that people should be indifferent between the two groups. However, this article demonstrates that people utilize spatial grouping, a non-informative factor, as a cue in their preferences. I call the differential influence of groupings on decisions the cooler effect.

The cooler effect in the gain and loss domains is demonstrated in experiments 1 and 2. Both experiments use different domains of product choice and a game of chance to test the robustness of the findings. Subsequently, an underlying process utilizing gestalt theory and contagion theory is proposed. Further three alternate accounts are presented – motivational reasoning, contagion by itself being sufficient, and gestalt perception by itself being enough. Experiments 4 and 5 test the proposed account, rule out the alternate

accounts, and moderate the differential influence of spatial grouping on choice in the domain of gains and losses. Finally, theoretical and managerial implications are presented.

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Iowa City, Iowa

CERTIFICATE OF APPROVAL

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PH.D. THESIS

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has been approved by the Examining Committee
for the thesis requirement for the Doctor of Philosophy
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To Mummy and Dad

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In everyday life, we often encounter groupings of objects. It could be a group of products kept on a retail shelf, food items in a shop window or depictions of groups of objects or people in an advertisement. However, very little attention has been paid to how these different groupings could influence consumer decisions. The main aim of this article is to study the influence of such groupings on consumer choice and behavior.

A new phenomenon is presented that studies the influence of gestalt grouping of objects, such as economy, symmetry, and similarity in different consumer decision domains. Specifically, it is proposed that when each object in two groups has an equal chance of a gain (for instance, one in 10 has a gift coupon), then people prefer to select an object from the group with better gestalt features. However, when each object in two groups has an equal chance of a loss (for instance, one in 10 is defective), then people prefer to select an object from the group with worse gestalt features. Normative theory would predict that people should be indifferent between the two groups. However, this article demonstrates that people utilize spatial grouping, a non-informative factor, as a cue in their preferences. I call the differential influence of groupings on decisions the cooler effect.

The cooler effect in the gain and loss domains is demonstrated in experiments 1 and 2. Both experiments use different domains of product choice and a game of chance to test the robustness of the findings. Subsequently, an underlying process utilizing gestalt theory and contagion theory is proposed. Further three alternate accounts are presented – motivational reasoning, contagion by itself being sufficient, and gestalt perception by itself being enough. Experiments 4 and 5 test the proposed account, rule out the alternate

accounts, and moderate the differential influence of spatial grouping on choice in the domain of gains and losses. Finally, theoretical and managerial implications are presented.

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CHAPTER 1: INTRODUCTION

Consider the following excerpt from Hemingway's novel "The old man and the sea". "He was an old man who fished alone in a skiff in the Gulf Stream and he had gone eighty-four days now without taking a fish. In the first forty days a boy had been with him. But after forty days without a fish the boy's parents had told him that the old man was now definitely and finally *salao*, which is the worst form of unlucky, and the boy had gone at their orders in another boat which caught three good fish the first week."

Or consider the movie "The Cooler". In it, William Macy plays a character who supposedly suffers very bad luck. The premise is that he has such appalling luck that he can actually cool off other peoples' good luck simply by being near them. He is hired by a casino manager, Alec Baldwin, to go and stand near casino players on winning streaks, in the belief that he can actually cool-off the luck of the winners. The movie depicts several scenes where Macy goes and stands near winners and they start losing.

"The Cooler" and Hemingway are presumably drawing upon a belief people have of wanting to stay away from individuals whom they consider unlucky. This appears to be an age-old belief that luck is contagious and can be transferred from one to the other person. The belief does not follow normative probabilistic principles that, given equivalent skill and resources, each day the old man had as much chances of catching a fish as any other fisherman on the Gulf Stream. Secondly, assuming there is no special knowledge about places where the fish are biting much better, the chances of the boy catching a fish is the same irrespective of whether he is in the old man's boat or any other boat. In a similar vein, the probability of winning or losing in the casino is not dependent

upon whether the "cooler" is standing next to you. One's own chances are dictated by the chances inherent in the game.

The examples highlight that at times judgments are not solely based on the relevant information but are colored by subjective beliefs and experiences (that luck is contagious) or the cues present in the environment (the presence of the "cooler"). The examples are consistent with the heuristics and biases literature pioneered by Tversky and Kahneman (1974) suggesting the use of rule of the thumb heuristics to arrive at quick judgments and also consistent with work showing that situational factors present at the time of consumption or purchase influence subsequent likelihood estimate, choice or decision (Belk 1974).

The premise of the movie and the book is that good or bad qualities can be transferred by being near the source of the qualities. Spatial groups are an instance in which people or objects are seen together prompting questions such as, are people likely to believe that a good or bad quality in one person or object transferable to others in the same group? Does the entire group start reflecting the good or bad qualities inherent in one of its members? Such queries are relevant to consumer decision making since instances of such groupings are abundant in marketing. For example, we regularly see groups of products in a retail store. Consider a group of Pepsi bottles kept together on a retail shelf. If one of the bottles is associated with some gain, for instance a gift coupon, will this sense of gain be reflected by the whole group of Pepsi bottles? Will the good feelings associated with a delicious dessert spread to other food items grouped around it?

Despite its relevance, very little attention has been paid to the variety of influences spatial groupings have on consumer preferences. The focus of this thesis is to

study how spatial groupings, and the belief that good and bad qualities spread in a group, affect consumer preferences, both in the domain of gains and losses.

In this thesis, I propose that when each object in two groups has an equal chance of a good event occurring then people prefer to select an object from the group in which the objects are kept together. However, when each object in two groups has an equal chance of a bad event occurring, people prefer to select an object from the group where the objects are kept far apart. Consider an instance when two groups provide an equal chance of a gain (e.g., one product in each group contains a gift coupon) then people prefer choosing from the group in which objects are kept close together (the 'close' group). However, when two groups provide an equal chance of a loss (e.g., one product in each group has a defect), people prefer choosing from the group where the objects are kept far apart (the 'apart' group). Such a pattern of preferences would indicate that in the domain of gains people feel there is a higher likelihood of drawing the gain-product (the specific product with a gift coupon) from the close group, while in the domain of losses they feel there is a lower likelihood of drawing the loss-product from the apart group. Similarly, in a game of chance where winning entails picking a blue ball from a group of 10 red and 10 blue balls, people would prefer to play the game in a setting where the red and blue balls are grouped close together. However, when losing entails picking the blue ball people prefer a setting where the red and blue balls are grouped far apart. Since the probability of winning or losing is 50% in both the close and the apart group the spatial arrangement should normatively have no influence on probability estimate making people indifferent between the two groups. However, in my thesis I demonstrate that people

utilize the spatial grouping, a non-informative factor, as a cue in their probability estimates. I call such a change in preference due to spatial grouping the cooler effect.

The structure of the thesis is as follows. Experiment 1 provides preliminary evidence in support of the cooler effect. Experiment 2 replicates the cooler effect in a different domain. In the theoretical development section, I discuss the possible mechanisms that underlie the effect and present findings from relevant literature. The conceptualizations section, integrates the findings from extant literature and proposes a process account that underlies the cooler effect. Alternate accounts are also presented that could potentially explain the cooler effect. Experiment 3 shows that the cooler effect is utilized by people as a cue or a heuristic. Experiments 4a and 4b test for the feasibility of the proposed account and alternate accounts. Experiment 5 moderates the cooler effect and provide more process tests for the underlying mechanism. Finally, I discuss the managerial and theoretical implications of the findings.

CHAPTER 2: EVIDENCE FOR THE COOLER EFFECT

Experiment 1

The main aim of the experiment was to demonstrate the cooler effect in a consumer decision-making domain. In order to simulate realistic behavior the task was designed to have real payoffs in which the participants actually received the product that they chose. Participants were exposed to two groups containing an equal number of ketchup bottles, the only difference was that one group had the bottles arranged close together (close group) and the other had the bottles arranged far apart (apart group). One ketchup bottle in each group was associated with either a gain or a loss. The choice of any one group over the other (in each domain – gain and loss) would be indicative of one expecting higher chances of gaining and lower chances of losing from the chosen group. If this were not so, one should be indifferent between the two groups, which would be the normative response here since the probability of gaining or losing is the same for both the groups.

Method

Eighty participants took part in the experiment for partial course credit and were randomly assigned to the loss or gain condition. All participants were taken to a separate room one at a time and were shown two groups of nine ketchup bottles. That is, each participant always saw both groups of ketchup bottles. They were given a questionnaire that contained the instructions and were left alone to fill out the questionnaire. Participants indicated if they would prefer to choose a bottle from the close group, apart

group or whether they were indifferent between the two groups. On the next page of the questionnaire, they were then asked to pick up a bottle from their chosen group.

Independent variables

Spatial grouping. To manipulate spatial grouping, two groups each containing nine ketchup bottles were shown to the participants, the only difference was that in one group the bottles were kept apart (apart group) and in the other group the bottles were kept close to each other (close group). Both groups of bottles were placed on two identical tables.

Loss versus Gain. Participants in the loss domain were told that one ketchup bottle in each group, of the nine displayed, had a defective lid which caused the ketchup to splash all over the place when it is poured out. However, since all bottles are sealed, it is not known which is the bottle with the defective lid. Picking the defective bottle would entail a loss of $3 which is the price of the bottle as this bottle would not be usable. Participants were told that there was one defective lid bottle in each group. Participants in the gain domain were told that one bottle in each group, of the nine displayed, had a bottle that contained a gift coupon for $3. Again, the participants were told that it was not known which of the nine bottles had the gift coupon. Importantly participants were told that there was one bottle in each group that had a gift coupon.

Location order. To ensure that location of the bottles did not influence choice, the order was counterbalanced with the apart group appearing on the right for some participants and appearing on the left for the others.

Choice order. To address the issue that if participants have indicated their choice first and then given their preference for each of the two groups then they would feel the

need to give choice-consistent responses, the order in which choice and preference ratings were taken was counterbalanced.

Thus, the design of the experiment was a 2 (domain: gain vs. loss) x 2 (location order: apart group on the left vs. apart group on the right) x 2 (rating order: choice first vs. choice second) between participants design with spatial grouping manipulated within participant.

Dependent variables

Choice. Participants indicated from which of the two groups of ketchup bottles they would like to choose a bottle. They could either choose from the apart group or the close group or indicate that they were indifferent. Further, all the bottles had an identifying number to help participants write down their chosen bottle since they would actually receive the bottle they had chosen. The number was used to find out whether there was a specific pattern in which participants chose the bottles, from the middle, the edges or just randomly.

Preference. Participants were asked how much they would prefer to choose a ketchup bottle from the close group and how much they would prefer to choose from the apart group on a five point rating scale anchored at 1 with "don't prefer" and at 5 with "prefer".

Results and Discussion

Choice. The domain, gain versus loss, had a significant impact on the choices made by the participants, χ^2 (2) = 14.73, $p < .0002$. Decomposing the interaction provided the following results.

In the gain domain, significant differences emerged across participants choices χ^2 (2) = 29.46, $p < .0001$. Specifically a significantly greater number of participants, 70.73% chose to select a bottle from the close group, compared to 1) 26.83% who choose from the apart group χ^2 (1) = 8.1, $p < .004$ and 2) 2.44% who were indifferent between the two groups χ^2 (1) = 26.13, $p < .0001$.

In the loss domain also, significant differences emerged across participants choices χ^2 (2) = 24, $p < .0001$. Specifically a significantly greater number of participants 69.2% chose to select a bottle from the apart group, compared to 1) 23.08% who choose from the close group χ^2 (1) = 9, $p < .002$, and 2) 7.6% who were indifferent between the two groups χ^2 (1) = 19.2, $p < .0001$. The location order did not interact with domain, $F < 1$, $p > .50$. Further, the choice order did not predict choice, $F < .4$, $p > .60$ across the domains of gain and loss.

Preference. A significant spatial grouping x domain interaction emerged $F(1, 78) = 25.05$, $p < .0001$. Specifically, participants in the gain domain preferred to choose from the close group ($M = 4.05$) compared to the apart group ($M = 2.73$), $F(1, 40) = 26.62$, $p < .0001$. In contrast, participants in the loss domain preferred to choose from the apart group ($M = 3.69$) compared to the close group ($M = 3.10$), $F(1, 38) = 4.32$, $p < .04$. Further, participants preferred the close group more in the domain of gains ($M = 4.05$) than in the domain of losses ($M = 3.10$), $F(1, 78) = 18.99$, $p < .0001$. However, participants preferred the apart group more in the domain of losses ($M = 3.69$) than in the domain of gains ($M = 2.73$), $F(1, 78) = 21.68$, $p < .0001$. Again, location order and choice order did not predict preference (F's <1), nor did it interact with the other factors. Moreover, no specific pattern emerged in the manner in which participants picked up the

bottles from the groups. They were equally likely to pick from the edges as from the center of the group.

Since I had gathered both preference and choice data, I measured the correlation between these two dependent variables. The choice data was recoded such that 0 represented choice from the apart group and 1 represented choice from the close group. The correlation between choice and preference for the apart group was -.68 ($p < .001$) and the correlation between choice and preference for the close group was .70 ($p < .001$). This high level of correlation allows me to measure either choice or preference separately in subsequent experiments knowing that both values would follow the same pattern. Table 1 provides detailed results and figure 1 graphs the results.

Source	*df*	*SS*	*MS*	*F*
Between subjects	79	26.69		
Domain	1	0.002	0.002	0.01
Residual between	78	26.69	0.34	
Within subjects	80	154.76		
Spatial grouping	1	5.28	5.28	3.64**
Spatial grouping X Domain	1	36.33	36.33	25.05*
Error (spatial grouping)	78	113.15	1.45	
Total	159	181.45		

Note. $N = 80$

*$p < .001$, **$p < .05$

Table 1: Experiment 1

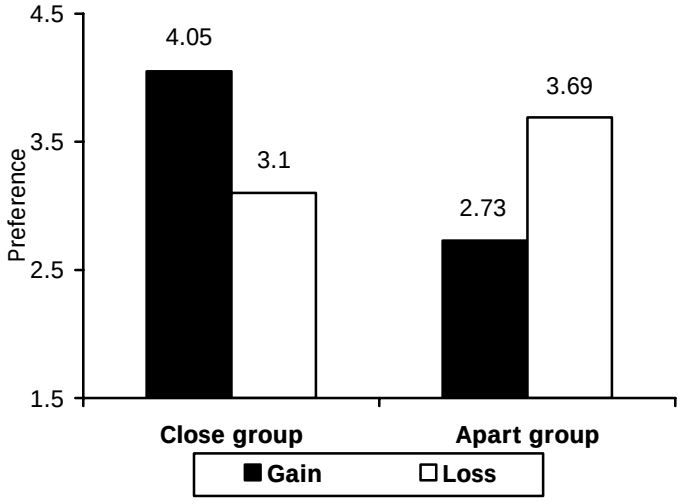

Figure 1: Demonstration of the cooler effect, Experiment 1

Experiment 1 provides evidence for the occurrence of the cooler effect when the grouping of products is varied. Note that the probability of picking the defective ketchup bottle or the gift coupon bottle is identical for both the groups. However, it can be seen that the spatial group is used as a cue that leads first, to a higher preference for one group and second, to a reversal of preference between the domain of gain and loss. However, it can be argued that the gains and loss in experiment 1 are not equal in monetary value. To address this concern I conducted experiment 2.

Experiment 2

In order to ensure that the loss and gain amounts were equal to each other a simple game of chance was devised in which individuals could either win or lose money based on their choices. The experimental setting also served to replicate the cooler effect in a different domain.

Method

One hundred and nineteen participants were randomly assigned to a gain or loss game. Each participant was first shown two identical tables. On each table 8 red and 8 blue balls were arranged. One table had the 16 balls arranged close together (close group) and the other table had the 16 balls arranged apart (apart group). All the balls were wrapped in a silver foil therefore; participants did not know which was a blue and which was a red ball. Participants first choose the table from which they wanted to play the game. Once they had chosen a table containing either the group of balls kept close or kept apart they were asked to pick up a ball from the chosen group. Participants in the gain

game were told that if they picked a blue ball they would win $3 while participants in the loss game were told that if they picked a blue ball they would lose $3. For the gain game, the experimenter kept $3 on the table prior to the game and ten randomly chosen participants who actually picked the winning ball received the three dollars. For the loss game, participants were asked to keep $3 on the table prior to the game. Only participants who volunteered to do so played the loss game. If they picked the losing ball they were told that they had lost the money. However, during debriefing they were given back the money. This procedure was adopted to ensure that actual loss and gain was present in the task. The dependent variable was from which table participants chose to play the game. Gender data was also collected to study whether the cooler effect emerged differently for men and women.

Results and Discussion

The domain, gain versus loss, had a significant impact on the choices made by the participants, □2(2) = 11.25, $p < .0008$. In the gain game, a significantly greater number of participants chose to play from the table with the close group rather than the table with the apart group (67.86% vs. 32.14%, $\chi 2(1) = 7.14$, $p < .007$). A reversal of this was observed for the loss game in which participants chose to play from the apart group rather than the close group (63.49% vs. 36.51%, $\chi 2(1) = 4.58$, $p < .03$). The results are indicative that individuals believe that they have greater likelihood of winning from the close group and a lower likelihood of losing from the apart group, providing more support for the occurrence of the cooler effect. Finally, no gender differences emerged.

In the next section, I review three streams of literature which I subsequently integrate to provide a process account for the cooler effect. First, characteristics of spatial

grouping can be studied by using gestalt theory of perception. Second, the theory of contagion in social psychology is associated with studying beliefs of how good or bad qualities can be transferred from the source to the target. Finally, the literature on subjective probabilities deals with how beliefs can influence and at times bias actual estimates.

CHAPTER 3: THEORETICAL DEVELOPMENT

Gestalt Theory of Processing

Many The term gestalt means an "organized structure" or a "whole" that is orderly, rule-governed, and non-random. A group of objects arranged economically, regularly, simply, symmetrically, proximally etc is said to possess gestalt features. The study of gestalt is concerned with the primary process of perception. It is generally agreed that when we look around it is not a passive recording of information impressed on the sensory organs by the environment. Rather, it is an active process of construction by means of which sensory data are selected, analyzed and integrated with properties often not directly noticeable but only hypothesized, deduced or anticipated according to available information and intellectual capacities. The organism picks up information about the stimulus from the stimulus itself (Gibson 1966). In her book Wisdom and the Senses Joan Erickson has written, "it is important to realize that all knowledge begins with sensory experience. The role of the senses, then is, to inform the mind." (1988, pg 25). Smith (1989) presents a comprehensive model that explains the process of representations being built up from features and existing as a cohesive unit once they are formed. The representation then undergoes subsequent processing. In other words, basic sensory processes provide information to the higher order cognitive processes. The term "perception" is generally used to define this process, which begins with the sensory input and leads to a coherent phenomenal world where we can behave securely based on vision and thought. Kaniza (1979) argues persuasively that it is difficult to separate vision and

thought in the process of perception since the simple identification of a visual object (even as a blur) implies an elementary logical process of categorization.

Perception thus can be thought to consist of a primary and a secondary process. The primary process, sometimes called the preconscious process, occurs when the cues from the environment impinge on the sensory organs and the sensory input is converted into segregated units. The primary process goes beyond registering cues or the first-degree visual information. It is a process by which the optical system processes, organizes and transforms an unrelated set of cues (which theoretically could be combined in infinite number of ways) into a certain number of segregated units with precise spatial and temporal relationships of similarity, size and functional dependence. These organized units form the second-degree data upon which successive secondary cognitive activities operate. The secondary process has received much attention and involves the description of the steps that the mind uses to process the sensory data in order to make them understandable to the observer. In other words, we can think of the processes as sequential where the sensory output of the primary process serves as the input for the inferential secondary process.

Gestalt psychologists have concerned themselves mainly with the primary process. They propose that the sensory organ receive the cues from the environment and generate phenomenological units or objects with all their features of color, size, shape, movement and expressiveness. The sensory organs receive cues from the environment, which are then utilized by higher order cognitive processes (Kohler 1929; Koffka 1935; Kimchi 1992). The term gestalt means “organized structure” or a “whole” that is orderly, rule-governed and non-random. The way gestalt has been popularly defined is to state

that “the whole is greater than the sum of its parts” and the whole” comes to mind first, faster and more meaningfully than its constituent “parts” (Kohler 1929; Koffka 1935; Kimchi 1992; Sekular, Palmer and Flynn 1994). Findings indicate that a group of objects that possess gestalt features are believed to form a better whole or group and hence are coded more efficiently and economically (Palmer 1982). Recent research findings from highly diverse domains ranging from summarized events (Ariely and Carmon 2000, 2003; Ariely and Zauberman 2000), extended experiences (Ariely and Zauberman 2003), assessment of experiences (Kahneman et al. 1993), intertemporal choice (Lowenstein and Prelec 1993), entitativity (Yzerbyt, Rogier, and Fiske 1998; Campbell 1958), and the gambler’s fallacy (Roney and Trick 2003) have demonstrated the influence of gestalt perceptions on judgments.

An important principle of gestalt theory is that of Prägnanz or “goodness of form” – that is, the tendency of a perceptual process to realize the most regular, simple, cohesive, ordered, balanced state possible in the given situation. The term regular does not necessarily mean geometric regularity such as squares, triangles and rectangles but images with which we are familiar with and hence see as stable or common. When we open our eyes we are immediately exposed to several visual cues available in the environment. Due to our need to see Prägnanz we sometimes don’t see what is there actually but what we would expect to see. There are several processes that can occur because of our need to see a “good form”. We process the whole structure before we pay attention to the individual parts, we process the structure first that is the most economical and requires the least effort or energy, we see objects even if they are partially hidden behind others (figural completion), we fill in gaps and are able to perceive a complete

object (amodal completion), or the most regular, symmetric or familiar structure is processed before we see the other structures around it. Thus, there are several ways in which a structure can either possess or not possess gestalt features of goodness of form.

Kanizsa (1979) finds that people generally look at two configurations and intuitively decide which of them has more Prägnanz. Coding theory predicts that observers will perceive the simplest completion possible for the scene as a whole (Buffart, Leeuwenberg, and Restle 1981). For instance, economy is a factor that can determine whether one configuration has more or less Prägnanz and the gaps between the elements of a configuration contribute to this sense of simplicity. A configuration that has more gaps is considered less economical as effort or energy is needed to combine all the individual elements together to form a complete whole. Gaps or distance between the individual elements makes them stand apart and hinders in the processing of a whole. On the other hand, a configuration with no gaps or less space between its elements has more Prägnanz or gestalt wholeness as it is simple to perceive the combination of the individual parts as a whole structure (Kanizsa 1979).

Researchers have explored the gestalt property of economy from a different angle. They use the process of filling-in to explain why configurations with gaps have less simplicity. The term “filling-in” is used to define a process of perceptual completion that people seem to perform without awareness. For instance, we have a blind spot in each eye corresponding to the region where the optic nerve leaves the retina where there are no photoreceptors. In everyday perception we are never aware of the blind spot because perceptual completion phenomena are accomplished by the brain providing information to make up for an absence –the brain actively fills in the missing information

(Ramachandran and Gregory 1991). Therefore, when the distance between individual objects is large, the mind, which is automatically filling-in the gaps to form a simplistic whole, expends more energy compared to when the objects are kept near each other. Clinical studies corroborate the evidence that extra effort is put in by the brain not only due to limits in one's abilities to attend to multiple areas in space, but also due to limits in one's abilities to attend to multiple objects in a scene (Robertson and Marshall 1993).

Consider the circles in figure 2. They demonstrate the gestalt property of similarity, since people group the circles of the same color together. That is, they tend to group vertically and not horizontally. The black (or white) circles come together to form a cohesive whole vertically but the alternate black and white circles do not group as well horizontally.

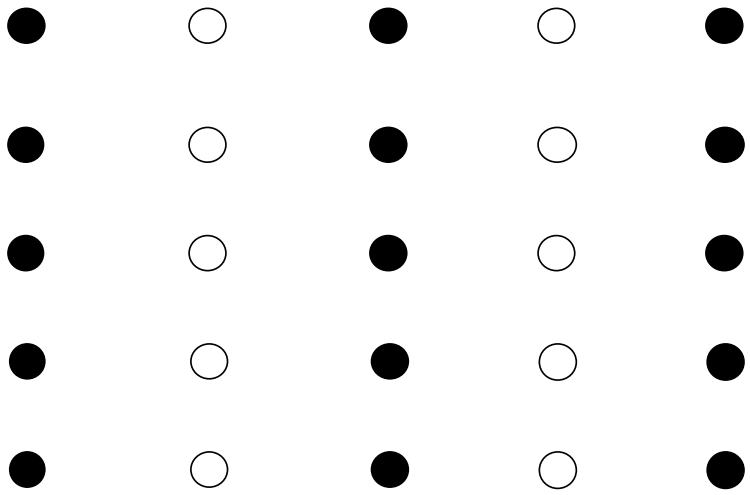

Figure 2: Gestalt property of similarity

In sum, the gestalt theory of perception states that people find it easier to perceive a complete whole in those arrangements that have gestalt features of economy, symmetry, harmony, similarity etc. It is simpler, faster, and less effortful to process an arrangement that has gestalt features than one which does not have these features (Kimchi 1992; Sekular, Palmer and Flynn 1994). Gestalt theory has several implications for the study of groups since a group with better gestalt features is considered to form a better whole, a more cohesive unit, or a unified structure. A group consisting of similar, proximal, or symmetrically arranged objects is likely to be perceived as a more unified and cohesive whole than a group consisting of dissimilar, distal or asymmetrically arranged objects (Kimchi 1992; Sekular, Palmer and Flynn 1994). For instance, a group of children wearing the same school uniform are easily categorized to be part of the same group rather than those wearing their unique dresses.

Theory of Contagion

Contagion is considered to be a belief that is utilized by people to make sense of the world and promote adaptive behavior. Freud (1950) considered it to be a part of an intuitive, primitive mode of thought. Contagion is an age-old concept that suggests that there is a transfer of some property or quality called the ‘essence’ from the source to the target. The qualities exchanged could be physical, mental or moral in nature and positive or negative in valence. An interesting experiment was conducted by Rozin, Millman, and Nemeroff (1986) to illustrate the theory of contagion. Participants filled sugar into two empty bottles from a new 5 lb box. Then the participants were asked to put peel-off

labels, one that read "Sucrose" and the other which read "Sodium Cyanide" on each bottle, in any way they wanted. Although participants knew that the bottles were filled with sugar and they themselves had randomly labeled the bottles, they indicated a significant preference for the sugar in the bottle labeled "Sucrose" and did not want to drink a sugar solution that had a spoonful of sugar from the bottle labeled "Sodium cyanide". The results of this study indicated that even an innocuous label is assumed to transmit the poisonous qualities of sodium cyanide to a sugar solution. Recent investigations in marketing literature have also looked at the role of contagion. Consumers do not like to buy products, which have previously been touched by others (Argo, Dahl, and Morales 2006) and experience disgust for products touched by other disgusting products in a shopping cart (Morales and Fitzsimons 2006).

Researchers have demonstrated various characteristics of contagion (Rozin and Nemeroff 2002; Rozin, Markwith and Nemeroff 1992). First, physical proximity enhances the sense of contagion (Morales and Fitzsimons 2006). A sealed bottle of rat poison kept near one's food is considered more contaminating than rat poison kept some distance away. Second, once the target is in contact with the contaminated object, the essence of the object is considered permanently transferred to the target. Irrespective of whether a piece of silverware has been used either a day before or a year before by someone with AIDS, people show equal disinclination to use it. This highlights the feature that once contact has been made it always contains the essence that has been transferred to it by the initial contact, and has flavors of the loss of innocence – once polluted, forever polluted. Third, contagion is considered "holographic" - that is, all the properties of the source object pervade the entire source and are contained in its essence.

That is, if any one part of a whole has the property then the complete whole, of which the part is one component, is considered to have the property. For instance participants indicated that there would be no part of the body of an AIDS patient that they would be willing to touch, even hair or elbows, compared to a corresponding place on the body of a healthy stranger. Fourth, findings have indicated that a wide range of properties are considered potentially contagious or transferable. For instance, physical attributes like size, growth rate, color or illness; abilities like strength, coordination or visual acuity; disposition like personality or characteristics and moral qualities are all considered contagious.

Several themes have been put forth on the origins of contagion. It has been posited that contagion originated in association with disgust when people rejected certain offensive foods, or it has its origin in the interpersonal illness domains, or its origin is in the positive contagion domain defined by blood ties and kinship.

Contagion theory has found a wide range of applications in different domains. For instance, risk perceptions have generally been studied as individual level cognitive mechanisms in which an individual collects, forms, and processes perceptions as an individual unit who is not connected to the social system. These systems ignore how perceptions of risk begin to vary within or between communities. The network theory of contagion has been used to explain the relational aspects of individuals and resulting networks that strongly influence individual perceptions of risk. This theory suggests that meaning is constructed based on understanding, perceptions and social influence (Scherer and Cho 2003). The findings of the study indicate that more frequent contact (higher

contagion) between members of a community increases the similarity in their risk perception of a probabilistic event.

Financial contagion has been a topic of discussion beginning from the early nineties with economies around the world being affected by global market-level forces. It brought into sharp focus the fact that economies and decisions are no longer isolated concepts, but occur in response to other forces. Some causes of financial contagion are macroeconomic similarities, common shocks and shifts in investor sentiment (for example, market psychology, herd behavior, "rush for the exits," etc.) (Caramazza, Ricci, and Salgado 2000). Zhu and Wang (2004) consider an important variable which they call a psychic distance variable, composed of various dimensions including geographic distance, cultural distance, development level, and membership and/or neighborhood effects, that is designated to account for the occurrence of a cross market herding behavior in the format of speculation, mimic, or rush for exit, that is not related to a country's macroeconomic fundamentals, but is due to changes in expectations based on incomplete information or in psychological perceptions.

In sum, contagion theory is applicable across domains and is based on people's belief that qualities are transferable and can influence preferences and behavior.

Probability Theory

Although the formal theory of probability is a human invention that did not come together until the 17th century, people apparently acquire an intuitive conception of probability without formal schooling on the topic. Piaget and Inhelder (1951/1975) reported that by age 10 or 11 children come to understand chance probabilities as the

proportion of favorable cases to total (favorable plus unfavorable) cases. Findings suggest that children may acquire this intuitive notion as early as age 9 and develop a capacity to explicitly match probability ratios by age 13 (Falk and Wilkening, 1998). Probability judgments involve the assignment of numbers to events corresponding to their perceived chances of occurrence. Probability estimation is a mathematical concept and strictly follows certain rules. Its value varies between 0 to 1 with 0 indicating absolute uncertainty and 1 indicating absolute certainty. Mathematical probability suggests that the process of estimation should be completely based on the provided information and should not be colored by subjective feelings or the cues present in the environment that are irrelevant to the actual value of the occurrence of the event. However, research across different domains has demonstrated that people, instead of assessing mathematical probabilities, assess subjective probabilities that are colored by internal and external factors, sometimes irrelevant to the process of probability estimation.

Probability and risk assessments are everywhere from assessing the performance of a new product, finding the profit-making potential of a new stock or in the food we eat. However, at times it is difficult to quantify probability since several factors together need to be kept in mind while assessing probability. Several factors both internal to the individual or external and present in the stimuli that affect probability estimates have been enunciated by Plous (1993). A factor that needs to be kept in mind is prior probability since it is the best probability estimate that one has before being exposed to a new piece of information. Probability estimates are also influenced by the valence of the outcome when people are asked to rate the probability of an outcome or bet on an outcome. All things being equal, finings suggest that positive outcomes are considered

more probable than negative outcomes. For instance, Weinstein (1980) documents findings which demonstrate that when students are asked to predict the chances of 18 positive and 24 negative life events occurring to them versus other students just like them, the students predicted that they were 15 % more likely than others to experience positive events and 20% less likely to experience negative events. To begin with, people make errors in judging the probability of simple events, which is further enhanced when they have to judge probabilities of compound events. For instance when people are asked to judge the probability of winning a lottery that involved eight alternatives and eight stages they predicted it to be 1 in 20 which was one million times too high an estimate (Cohen, Chesnick and Haran 1971). This type of overestimation occurs because people tend to anchor on the probabilities of a single simple event and insufficiently adjust for the fact that several such simple events need to take place all together to form a compound event.

In the domain of risk perception, people are more willing to accept voluntary risks (like smoking or ski diving) than involuntary risks (like electric power accidents) (Wilson 1979). This finding demonstrates that risk perceptions are very subjective to feelings and vary depending on the manner in which they are presented. In other word, context and comparison points play a very important role in whether people consider a risk to be high or low. Perceptions of risk are very strongly influenced by prior beliefs and are biased in the direction of these beliefs. Consequently, it becomes difficult to change them even in the presence of new data. For instance, if due to malfunction, safety procedures are deployed, one set of individuals would believe that the malfunction had a positive outcome as it showed that safety features were in working condition, while the other set

of people would focus on the negative outcome of costs associated with such false alarms (Slovic, Fischhoff, and Lichtenstein 1982).

Thus, the literature on probability estimates states that true mathematical probability should not be colored by subjective beliefs. However, in reality probability estimates tend to be affected by several subjective factors like beliefs, environmental cues, or comparative values.

CHAPTER 4: CONCEPTUALIZATION

Proposed Account

The reviewed findings in gestalt processing suggest that people perceive groups with better gestalt features (symmetry, similarity, economy, familiarity, simplicity) to form a better gestalt whole than groups with worse gestalt features (asymmetry, dissimilarity, distal, unfamiliarity, complexity). Lower effort or energy is needed to process groups with better gestalt features providing them higher Prägnanz or goodness of form (Kanizsa 1979). The literature on contagion suggests that the essence or properties of objects are believed to be transferred from a source to a target. If one member of a group has a specific quality then the property is believed to pervade the whole group (Rozin and Nemeroff 2002). Combining the findings of these two literatures, the following propositions are presented for groups with better and worse gestalt features and the resulting cooler effect.

Proposition for groups with better gestalt features

Objects or products grouped to possess better gestalt features are visually processed to form a better whole (Kanizsa 1979). The perception of a single whole inherent in such a group facilitates the notion of transference of properties since it is easy to imagine that properties can be transferred easily among the objects of the same group rather than between independent objects. That is, the perception of a single whole or unified group facilitates the belief that a gain or loss possessed by one object is transferred to other objects within the same group and is infused in the whole group.

Therefore, in the domain of gains, if one object has a gain associated with it (a gift coupon) then all objects in the better gestalt group are perceived to have the gain infused in them. People feel that by choosing from such a group they are increasing their chances of picking up the gain object. On the other hand, in the domain of losses, the loss is perceived to spread as strongly across the better gestalt group reducing people's willingness to choose from such a group. The operating belief would be that picking up an object from the better gestalt group would increase one's chance of choosing the loss object, which is never preferred. In sum, people prefer to choose from the better gestalt group in the domain of gains and do not prefer to choose from it in the domain of losses.

Proposition for groups with worse gestalt features

Groups that do not possess good gestalt features tend not to be perceived as a complete whole or a cohesive unit. For the purposes of this thesis, they are called the worse gestalt group. Therefore, objects which are arranged not to have good gestalt features stand out independently and are not visually perceived to be part of the same group. The independence and individuality of the objects hinder in the processing of a cohesive whole making it difficult for people to imagine properties being transferred across the objects. Therefore, in the domain of gains, the gain seems isolated to one specific object and is not perceived to spread across to the other objects in the group. Due to the lack of infusion of the gain quality across the worse gestalt group people do not prefer to choose from it since they do not believe they have a good chance of picking up the gain object. In contrast, in the domain of losses, the loss associated with one object seems to spread less in the worse gestalt group compared to the better gestalt group. By

choosing from the worse gestalt group, people feel that they have reduced their chances of picking up the loss object. The proposed conceptual framework is depicted in figure 3.

	CLOSE GROUP	APART GROUP
Gestalt/Sense of a single whole	Better	Worse
Contagion	High	Low
	↓	↓
Preference in gain	More	Less
Preference in loss	Less	More

Figure 3: Proposed conceptualization

Is it a heuristic?

People are exposed to several environmental cues that affect their judgment. At times, when everything else remains the same and the spatial grouping of the displayed objects is changed, people might utilize the spatial groupings to be a relevant cue to incorporate in their judgments. As proposed in the conceptualization section and

demonstrated in experiments 1 and 2, I have suggested that people prefer the close group in the domain of gains and the apart group in the domain of losses, although the chances of choosing the object with the positive or negative quality remains the same in both groups. This is indicative that spatial grouping, a non-informative cue, is being used in judgments and decisions. The question is whether this is an instance of faulty reasoning (i.e., some erroneous reason why the spatial grouping might be considered informative) or whether the spatial grouping is used as a cue or heuristic, much the way availability or representativeness is used. Past research indicates that heuristic processing is enhanced if people are performing another task that is utilizing their cognitive resources. The research suggests that since cognitive resources are limited, people have difficulty effectively handling more than one cognitively effortful task at the same time (Bargh 1994; Gilbert and Osborne 1989). People being "cognitive misers" would prefer to arrive at quick judgments that are least taxing of their resources. Researchers call the performance of a simultaneous distracter task as putting people under cognitive load. Therefore, if people are under cognitive load, their cognitive capacities are occupied with the distracter task. If they were simultaneously deciding which of the two groups, close versus apart, to choose from, and if the spatial grouping is being used as a cue or a heuristic, they should be even more likely to utilize the heuristic (since cognitive resources are even more scarce). Thus, a higher choice of the close group in the gain domain and higher choice of the apart arrangement in the loss domain should be observed, supporting the idea that the cooler effect is used as a heuristic.

In the next section, some potential alternate accounts are explored that could explain the results of experiments 1 and 2.

Alternate Accounts

Motivational account

The behavioral learning system postulates the presence of two dimensions of personality, the Behavioral Inhibition System (BIS) and the Behavioral Approach System (BAS) that respond to relevant environmental cues (Gray 1982; Fowles 1980, 1993; Carver and White 1994). BIS is the aversive motivational system, sensitive to signals of punishment, non-reward, and novelty that inhibits behavior leading to negative or painful outcomes. BAS controls appetitive motivation and is sensitive to signals of reward and non-punishment. BAS is responsible for the experience of positive feelings such as hope, elation, and happiness. It is reflected in greater proneness to engage in goal-directed efforts and to move towards an impending reward.

The BIS/BAS motivational account can explain the findings of experiments 1 and 2 in which participants chose from the close group in the gain domain and from the apart group in the loss domain. If the distance between the objects in a group can be mapped on to either, a sense of moving towards gain (approach tendency) or away from loss (avoidance tendency) then the following predictions can be made. The BIS is activated in the presence of a loss initiating a desire to move away from the loss. The apart group has objects kept away from each other, a perceptual cue that matches a motivation for increased distance and thus this group is preferred in the domain of losses. In contrast, the BAS is activated in the presence of a gain. The close group has objects kept close together, a perceptual cue that matches a motivation for reduced distance and thus this group is preferred in the domain of gains. In sum, the distance between objects maps onto approach/avoidance tendencies and consequently, the two motivational systems could

predict people's preference reversals in the domain of gains and losses for experiments 1 and 2.

Perceived-distance account

Rozin and Nemeroff (2002) and Rozin, Markwith, and Nemeroff (1992), suggest that proximity increases the likelihood of qualities transferring between objects. Qualities or properties are believed to spread more among objects kept close together compared to when they are kept apart. Thus, there would seem to be more transference of gain and loss among the objects kept close and less transference of gain and loss among the objects kept apart. Applying this explanation to the results of experiments 1 and 2 suggest that preferences are driven by perceptions about the extent of spread of qualities as operationalized by the distance between the objects within a group. In other words, perceived distance between the objects either increases (close group) or decreases (apart group) the sense of spread of qualities between the objects in a group.

Perceived numerosity account

A group with better gestalt features is considered to form a better whole or unitary structure. Since the group is considered more cohesive and unitary it is likely to create an illusion that there are actually less number of objects in a group with good gestalt grouping – literally, the objects are subjectively perceived as one unit rather than as a collection of units. The feeling that there are less objects increases ones subjective probability estimate of picking up an object from a group. Therefore, the better gestalt group would be perceived to have less number of objects than the worse gestalt group. In the gain domain, people would prefer to pick from the better gestalt group since they feel

the probability of picking the gain object is more in the better gestalt group considering it seems to have less number of objects (a chance of 1 out of 10 is better than a chance of 1 out of 12). Similarly, the worse gestalt group is preferred in the loss domain since it seems to have more number of objects, compared to the better gestalt group, reducing one's chance of picking up the loss object. In other words, this account would suggest that contagion is quite unnecessary to explain the cooler effect, which could be explained by the perceived numerosity of objects alone and their resulting impact on subjective probability estimates.

Experimental overview

Previewing briefly, experiment 1 tested the cooler effect in a product choice domain with real choice consequences, since participants received the chosen products. The experiment demonstrates how irrelevant contextual cues like spatial groupings could be used in product choice decisions. Experiment 2 replicates the cooler effect in a game of chance. Experiment 3 provides support that the cooler effect is used by people as a heuristic. Experiments 4a and 4b utilize a different gestalt property to study the influence of gestalt features on the cooler effect. The experiments were designed to test the feasibility of the proposed account and the alternate accounts. Experiment 5 uses a priming task to enhance and reduce perceived contagion and studies the subsequent moderation of the cooler effect.

CHAPTER 5: PROCESS TESTS

Experiment 3

The main objective of the experiment was to test the hypothesis that the cooler effect is used as a heuristic. If the spatial arrangement was being utilized as a heuristic to reduce the cognitive resources required in processing a stimulus, then increasing the cognitive load at the time of the choice task, should enhance the cooler effect. Since the scarce cognitive resources are already engaged with the secondary task, the likelihood of relying on the less demanding heuristic for the performance of the primary task will be higher. Specifically people under high cognitive load should be more likely to choose a product from the better gestalt group in the domain of gain but more likely to choose a product from the worse gestalt group in the domain of loss compared to people under low cognitive load. The gestalt feature manipulated between the two groups was economy (close versus apart group). The product category used in this experiment was coffee mugs. The location of the two groups of mugs was counterbalanced such that sometimes the apart group was on the left and sometimes it was on the right. Thus the design of the experiment was a 2 (manipulation: higher cognitive load vs. lower cognitive load) x 2 (domain: gain vs. loss) x 2 (location order: apart group of mugs on the left vs. apart group of mugs on the right).

Method

One hundred and fifty one participants took part in this experiment for partial course credit and were randomly assigned to one of the eight between subject conditions.

The participants were then taken inside the experiment room one at a time and were asked to imagine that they were planning on buying a coffee mug with the University logo. They were shown two groups of mugs and asked from which group they would prefer to choose a mug. While they were deciding on which mug to choose they were also asked to memorize a number. Similar to instructions given in past research (Gilbert and Osborne 1989), participants were told that many times we simultaneously handle two tasks like keeping different information in mind. Trying to keep the shown number in mind while making a choice would be similar to such a situation. Participants in the higher cognitive load condition were shown an eight-digit number and were asked to keep it in mind while making their choice. They were told that later in the experiment they would be asked to reproduce the same number as a test of their memory. Lower cognitive load condition participants were shown a two-digit number and were asked to keep it in mind (which would not be as cognitively effortful as remembering a eight-digit number).

Independent variables

Spatial grouping. They were shown two arrangements of nine mugs kept on two identical tables. One group had mugs kept close to each other (close group) and the other group had nine mugs kept apart (apart group). Both groups of mugs were arranged in identical shapes (squares consisting of three rows and three columns), with three mugs in each row and column, only the distance between the mugs was varied. The mugs were kept in similarly wrapped paper boxes and each of them had a number written at the bottom of the box.

Domain of gain and loss. Participants in the gain condition were told that one of the mugs in each group had a gift coupon worth $3 inside, while those in the loss condition were told that one of the mugs in each group had a defective lid which might cost them $3 to get repaired or replaced. Therefore, the probability of finding a coupon (or a defective mug) was same (i.e. 1/9) in both groups of mugs. In order to replicate a simulated shopping environment, participants were told that their choices would have real consequences. That is, at the end of the experiment there would be a lucky draw and 10 participants would receive the mug that they had chosen. Thus, participants would be best served if they chose a mug with the gift coupon (gain condition) or avoided choosing a mug with the defective lid (loss condition). The lucky draw also addressed the issue that people might not be motivated to enough to make a thoughtful choice. Having a real consequence provides sufficient motivation to respond after due thought.

Location order. The two groups were also counter balanced so that for some participants the apart group was on the left and for some it was on the right.

Dependent variables

Participants were asked whether they would like to choose a mug from the close group or the apart group on a five point scale with 1 anchored at "prefer to choose from the group on the left" and 5 at "prefer to choose from the group on the right". The data was then recoded so that preference for right indicated preference for close groups and preference for left indicated preference for apart group, such that 1 denoted a preference for the apart group and 5 denoted a preference for the close group.

Results

Consistent with the results of the previous experiments, an analysis of the preference data yielded a significant main effect of domain; participants in the domain of gain displayed more preference towards the close group compared to the participants in the domain of loss (M = 3.76 vs. 2.25, $F(1, 147) = 64.46$, $p < .0001$). This main effect was qualified by a significant manipulation x domain interaction $F(1, 148) = 9.64$, $p < .002$. A decomposition of the interaction across the domains of gain and loss indicated that in the gain domain participants in the high cognitive load condition displayed higher preference to choose from the close group compared to the low cognitive load condition participants (M = 4.02 vs. 3.47[1], $F(1, 74) = 4.56$, $p < .03$). In the domain of loss, participants preferred apart group more in high load than in low load conditions (M = 1.94 vs. 2.55, $F(1, 73) = 5.07$[2], $p < .02$). A decomposition of interaction across high and low load revealed that in both conditions participants preferred to choose from the close group in the domain of gains and to choose from the apart group in the domain of loss. Specifically, in high load condition preference for close group was higher in gain than in loss domain (M = 4.02 vs. 1.94, $F(1, 75) = 83.23$, $p < .0001$) , a pattern similar to the low load condition (M = 3.47 vs. 2.55, $F(1, 72) = 9.51$, $p < .002$). Table 2 shows the ANOVA table of the results.

Again, location order did not predict preference ($F < 1$), nor did it interact with the other factors. Table 2 provides detailed results and figure 4 graphs the results.

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[1]Mean preference in high load and low load conditions were significantly different from the scale mid-point "3", $t(39) = 6.32$, $p < .001$ and $t(35) = 2.30$, $p < .02$ respectively.

[2] Mean preference in high load and low load conditions were significantly different from the scale mid-point "3", $t(36) = -6.61$, $p < .001$ and $t(37) = -2.07$, $p < .04$ respectively.

Source	*df*	*SS*	*MS*	*F*	R^2
Domain	1	84.73	84.73	64.46*	0.28
Manipulation	1	0.02	0.02	0.02	0.00
Domain X Manipulation	1	12.66	12.66	9.64*	0.04
Within groups	147	193.23	1.31		
Total	150	277.96			

Note. $N = 151$

*$p < .001$

Table 2: Experiment 2

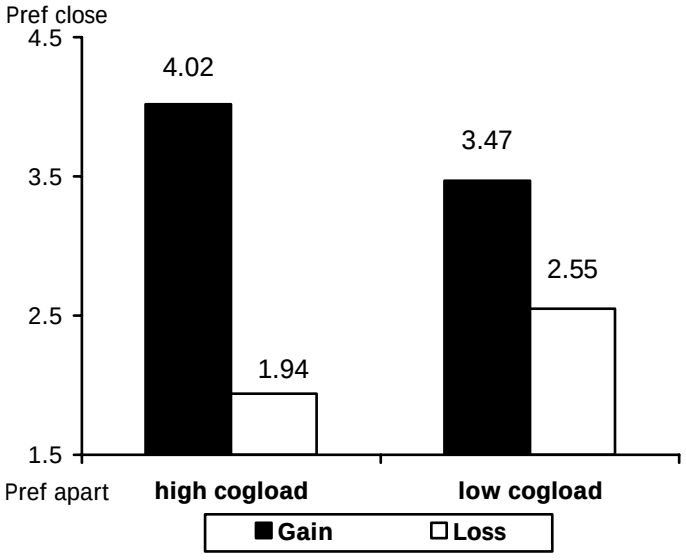

Figure 4: Moderation by Cognitive Load

Discussion

The results of experiment 3 indicate that under high cognitive load, the preference for the close group is enhanced in the gain domain and the preference for the apart group is enhanced in the loss domain. Thus, the grouping of the products appears to be utilized as a cue in decisions, lending support to the idea of the cooler effect being used as a heuristic.

As posited in the conceptualization section, the sense of transference of good or bad qualities is considered easier if the group is perceived as a single whole. Thus, the close group has a higher gestalt feature of economy and hence is perceived as a whole compared to the apart group, which has less gestalt features of economy. Both experiments 1, 2, and 3 utilized the gestalt feature of economy to demonstrate the cooler effect. In order to show the robustness of the cooler effect for other gestalt features and to gather process evidence experiments 4a and 4b were conducted.

Experiment 4: Test of the underlying process

Experiments 1, 2 and 3 used the gestalt property of economy to demonstrate the cooler effect. However, the alternate accounts of perceived-distance and BIS/BAS motivation can explain the results of the prior experiments since the close versus apart arrangement of products in a group maps on to predictions made by these alternate accounts. The proposed account suggests that a group with better gestalt features leads to a greater sense of a unified whole subsequently facilitating the notion of transference of properties within that group. A test of the proposed and alternate accounts lies in using a different gestalt feature and observing its subsequent influence on the cooler effect. If the

proposed account holds true then manipulating a gestalt feature other than economy should also produce the cooler effect. Experiments 4a and 4b varied the gestalt feature of symmetry. Objects grouped symmetrically are considered to form a better gestalt whole while objects grouped asymmetrically are perceived to form worse gestalt groups. Note that the property of symmetry does not map onto predictions made by either perceived-distance and BIS/BAS motivation accounts since both these accounts are concerned with the distance between the objects and not the symmetry. Experiment 4a varied the gestalt property of symmetry while keeping economy constant within the choice sets and experiment 4b varied the gestalt property of economy while keeping symmetry constant within the choice set to show the subsequent influence on the cooler effect.

Experiment 4a

In Experiment 4a, the gestalt feature of economy (i.e., close/apart) was kept constant within the choice set but the gestalt feature of symmetry was varied. The product used was Pepsi. That is, half the participants saw in front of them symmetric and asymmetric groups within a choice set with the products grouped close together, while the remaining participants saw symmetric and asymmetric groups within a choice set with the products grouped apart. The two choice sets are shown in figures 5 and 6 with each group being given an A and B tag. The between subject factor was economy (close versus apart) and the within subject factor was symmetry (symmetric versus asymmetric). Thus, the design of the experiment was 2 (domain: gain vs. loss) x 2 (choice sets: products in both groups kept close together [close condition] vs. products in both groups kept apart [apart condition]) x 2 (symmetry: symmetric group vs. asymmetric group)

mixed factorial with the first two factor varied between participant and the third being varied within participant.

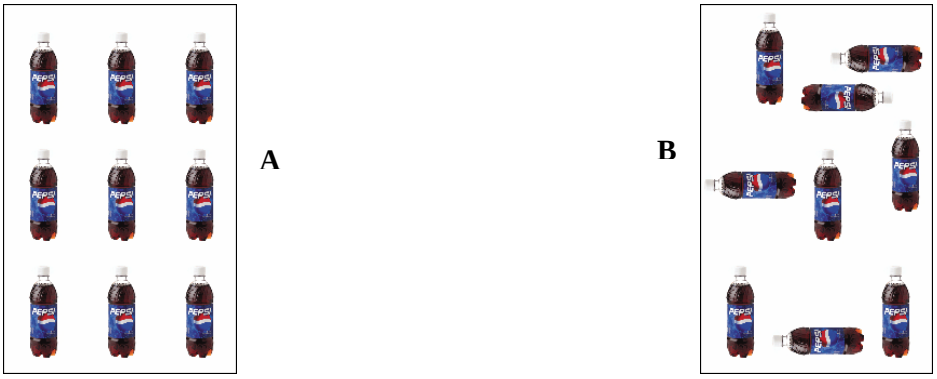

Figure 5: Close condition products
(A) Symmetric group
(B) Asymmetric group

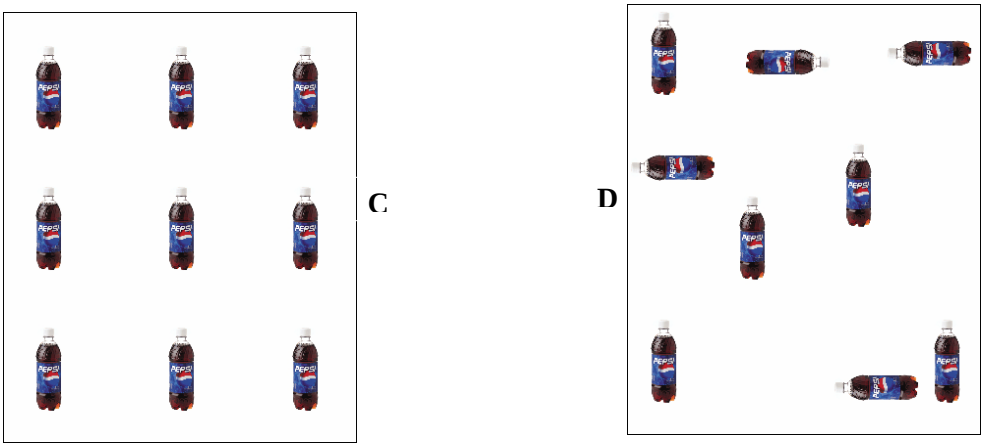

Figure 6: Apart condition products
(A) Symmetric group
(B) Asymmetric group

Groups with products arranged symmetrically (symmetric group) come together to form a better gestalt whole compared to groups with products arranged asymmetrically (asymmetric group). The proposed account suggests that better gestalt features result in higher perceived contagion. The stronger immediate perception of the whole facilitates the notion of greater perceived contagion in the symmetric rather than the asymmetric group. Therefore, in the domain of gain, participants should prefer the symmetric group over the asymmetric group since the former is perceived as a better whole inducing a higher contagion of gain qualities. On the other hand, in the domain of loss, participants should prefer the asymmetric group since it is perceived less as a whole and does not induce contagiousness of the loss qualities. The pattern of preference should remain the same in both the close and apart conditions.

The alternate account of perceived-distance predicts no influence of symmetry since symmetry (unlike economy) does not map onto perceived distance. Thus, individuals should be indifferent between the symmetric and asymmetric groups. Similarly, the BIS/BAS motivation account relies upon the distance between the products (since the distance between products maps onto approach/avoidance tendencies). This account would therefore predict no cooler effect due the gestalt feature of symmetry since the distance between the products does not change and symmetry or asymmetry does not map onto approach/avoidance perceptions. In sum, the proposed account would predict that symmetry would cause the cooler effect while both the perceived-distance and the BIS/BAS motivation accounts would predict the non-occurrence of the cooler effect.

Method

One hundred and forty five participants took part in the experiment for partial course credit and were randomly assigned to one of the between participant conditions. The experiment was conducted in a computer lab with each participant sitting at separate terminals. Each participant was given either a gain or loss description about the product, Pepsi. On the next screen, participants were asked to indicate how much they would prefer to choose a Pepsi bottle from each of the two groups. Participant were then thanked and debriefed.

Independent variables

Choice sets. Participants were shown one of two different choice sets. The first choice set had both groups of Pepsi bottles kept close together (close condition) with the bottles in one group arranged symmetrically (figure 5 – A) and the bottles in the other group arranged asymmetrically (figure 5 – B). The second choice set had both groups of Pepsi bottles kept apart (apart condition) and again one group of bottles was arranged symmetrically (figure 6 – B) and the other group arranged asymmetrically (figure 6 – A). Thus, the distance between the bottles, the gestalt property of economy, was kept constant within each choice set, only the gestalt property of symmetry was varied.

Domain. Participants in the gain domain were told that one of the nine Pepsi bottles in *both* the symmetric and asymmetric group contained a gift coupon worth $3. In the loss domain, participants were told that one of the nine Pepsi bottles in *both* the symmetric and asymmetric group had two flavors mixed together which made the taste a little sour. Importantly, it was not known which Pepsi bottle contained the gift coupon and which had the mixed flavors. It would be the best choice for the participants to pick

the bottle with the gift coupon in the gain domain and avoid the bottle with mixed flavors in the loss domain.

Dependent variable

Participants were asked how much they would like to choose from the symmetric group and how much they would like to choose from the asymmetric group on a five point rating scale anchored at 1 with "do not prefer to choose from" and at 5 with "prefer to choose from".

Results

Analyses were carried out across the close and apart conditions.

Close condition. In the close condition, a symmetry x domain interaction emerged $F(1, 72) = 9.52$, $p < .002$. Decomposing this interaction revealed that in the domain of gain, participants preferred to choose from the symmetric group than from the asymmetric group ($M = 3.89$ vs. $M = 3.26$, $F(1, 31) = 5.01$, $p < .03$). But in the domain of loss, participants preferred to choose from the asymmetric group compared to the symmetric group ($M = 2.63$ vs. $M = 2.14$, $F(1, 36) = 4.56$, $p < .04$). The preference to choose from the symmetric group in the gain domain and to choose from the asymmetric group in the loss domain argues against the perceived-distance and the BIS/BAS motivation accounts. Symmetry does not map on to perceived distance or BIS/BAS motivation and hence, if these accounts were to hold true then no differences in preference for the symmetric or asymmetric groups in the gain and loss domain should have emerged. Table 3 provides detailed results and figure 7 graphs the results.

Source	*df*	*SS*	*MS*	*F*
Between subjects	73	138.5		
Domain	1	52.67	52.61	44.19*
Residual between	72	85.83	1.19	
Within subjects	74	100.03		
Symmetry	1	0.16	0.16	.13
Symmetry x Domain	1	11.66	11.66	9.52*
Error (Symmetry)	72	88.21	1.22	
Total	147	238.53		

Note. $N = 74$

*$p < .001$

Table 3: Close condition – Experiment 4a

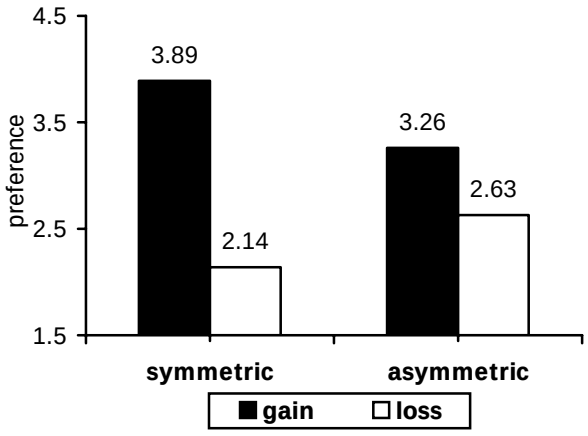

Figure 7: Close condition

Apart condition. Similarly, in the apart condition, a symmetry x domain interaction emerged, $F(1, 69) = 10.19$, $p < .002$. Decomposing this interaction revealed that in the domain of gain, participants preferred to choose from the symmetric group than from the asymmetric group ($M = 2.63$ vs. $M = 2.08$, $F(1, 31) = 5$, $p < .03$). But in the domain of loss, participants preferred to choose from the asymmetric group than from the symmetric group ($M = 3.79$ vs. $M = 3.31$, $F(1, 38) = 5.15$, $p < .02$). This again supports the proposed account and argues against the contagion only account and the BIS/BAS account since they would predict indifference across the symmetric and asymmetric groups. Table 4 provides detailed results and figure 8 graphs the results.

Source	*df*	*SS*	*MS*	*F*
Between subjects	70	120.85		
Domain	1	49.99	49.99	48.69*
Residual between	69	70.86	1.02	
Within subjects	71	71.34		
Symmetry	1	0.04	0.04	0.05
Symmetry X Domain	1	9.17	9.17	10.19*
Error (Symmetry)	69	62.13	0.90	
Total	141	192.19		

Note. $N = 71$

*$p < .001$

Table 4: Apart condition – Experiment 4a

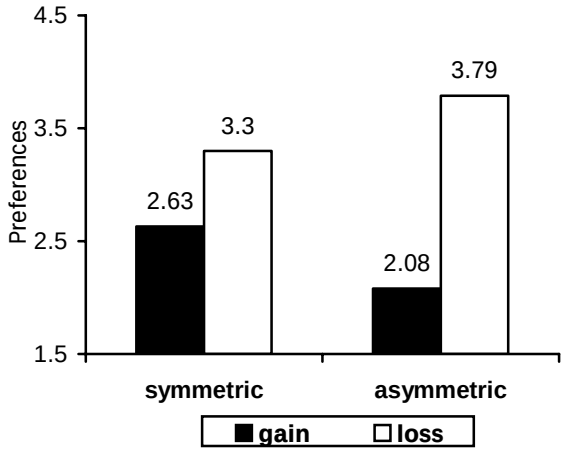

Figure 8: Apart condition

Discussion

The results of experiment 4a indicate that by changing the gestalt property of symmetry the cooler effect again occurs giving support to the proposed account. In both the close and apart conditions, in the domain of gain, participants preferred to choose from the symmetric compared to the asymmetric group while in the domain of loss they preferred to choose from the asymmetric group. Participants prefer the symmetric group in the domain of gains as it is perceived as a whole and induces a higher contagion of gain. On the other hand, in the domain of loss the asymmetric group is preferred as it is perceived as less of a whole and induces less contagion of loss. Further, this rules out the alternate perceived-distance and BIS/BAS motivation accounts that do not predict differences due to symmetry.

In Experiment 4b, the gestalt feature of symmetry was varied between participants and the gestalt feature of economy was varied within the choice set.

Experiment 4b

This experiment utilized a procedure identical to experiment 4a. The only difference being that the gestalt property of symmetry was kept constant within the two choice groups, while economy was varied between participants. That is, half the participants saw in front of them close and apart groups within a choice set with the products grouped symmetrically, while the remaining participants saw close and apart groups within a choice set with the products grouped asymmetrically. The two choice sets are depicted in figure 6 with each group being given an A and B tag. The between subject factor was economy (symmetric versus asymmetric) and the within subject factor was symmetry (close versus apart). Thus, the design of the experiment was 2 (domain: gain vs. loss) x 2 (choice sets: products in both groups kept symmetrically [symmetric condition] vs. products in both groups kept asymmetrically [asymmetric condition]) x 2 (economy: close group vs. apart group) mixed factorial with the first two factors varied between participants and the third being varied within participant. The product used was hand soap.

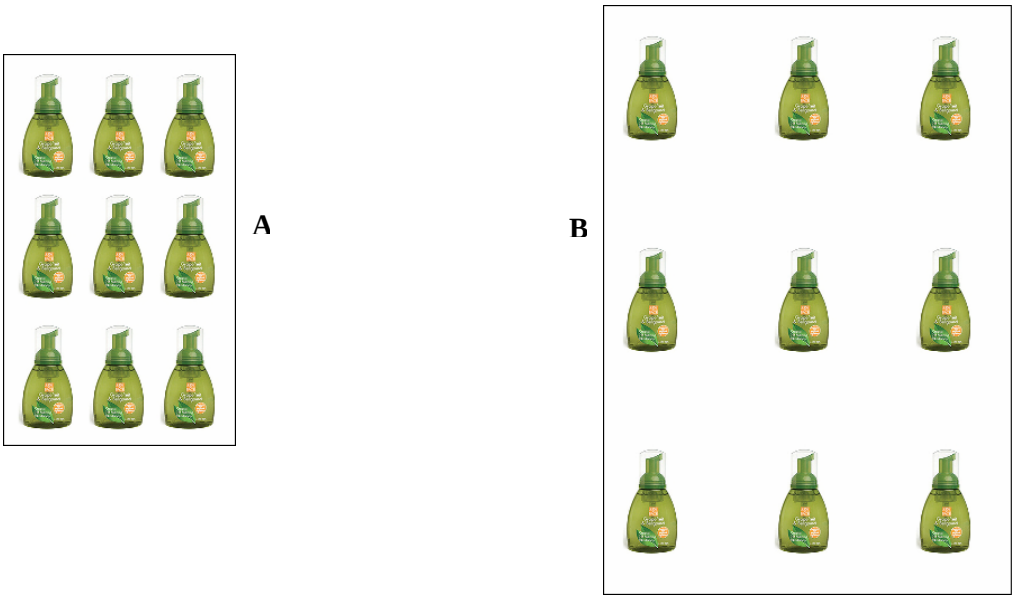

Figure 9: Symmetric condition products
(A) Close group
(B) Apart group

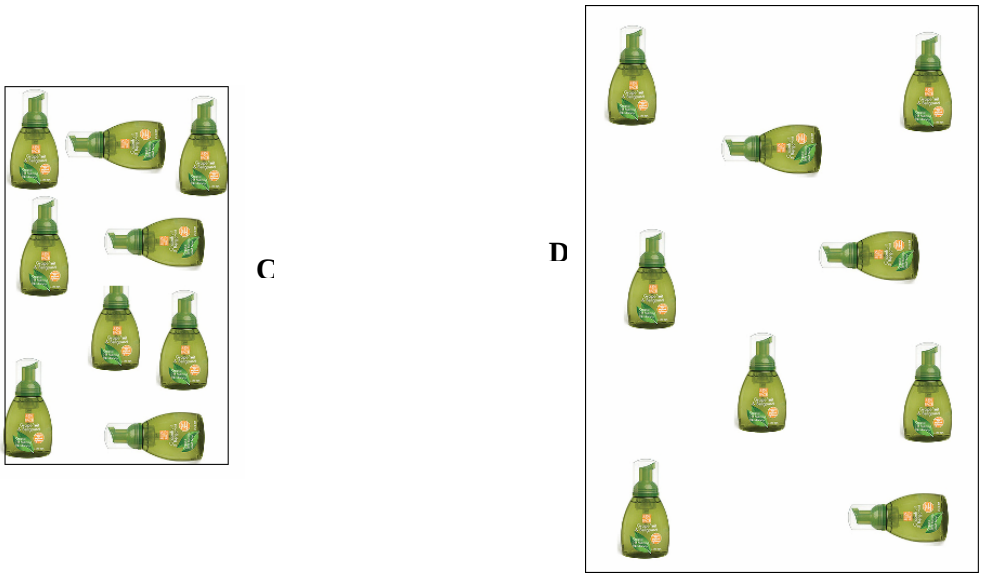

Figure 10: Asymmetric condition products
(A) Close group
(B) Apart group

It was expected that within a choice set the gestalt property of economy would lead to a better sense of a whole and induce higher perceived contagion and subsequently be preferred more in the domain of gain and preferred less in the domain of loss. The group with products kept apart has a lower gestalt property of economy decreasing the sense of a whole, inducing lower contagion and increasing preference in the domain of loss.

Method

One hundred and thirty seven participants took part in the experiment for partial course credit and were randomly assigned to one of the between participant conditions. The experiment was conducted in a computer lab with each participant sitting at separate terminal. Each participant was randomly given either a gain or a loss description about the product, hand soap. In the next screen, participants were asked how much they would prefer to choose from the close group and how much they would prefer to choose from the apart group. Participants were then thanked and debriefed.

Independent variables

Choice sets. Participants were shown one of two different choice sets. The first choice set had both groups of soap bottles arranged symmetrically (symmetric condition) with the soap bottles in one group arranged close together (figure 9 – A) and the bottles in the other group arranged far apart (figure 9 – B). The second choice set had both groups of soap bottles arranged asymmetrically (asymmetric condition) and again with the soap bottles in one group arranged close together (figure 10 – A) and the bottles in the other group arranged far apart (figure 10 – B). Thus, the gestalt property of symmetry,

was kept constant within each choice set, only the gestalt property of economy was varied.

Domain. Participants in the gain domain were told that one soap bottle of the nine in both the close and the apart group contained a gift coupon worth $3. It was not known which of the soap bottles had the gift coupon. In the loss domain, participants were told one soap bottle of the nine in both the close and the apart group had a defective dispenser, which would cause them a loss of $3 if they chose the defective bottle. It was not known which of the soap bottles had the defective dispenser. It would be the best choice for the participants to pick the bottle with the gift coupon in the gain domain and avoid the bottle with defective dispenser in the loss domain.

Dependent variable

Participants were asked how much they would like to choose a soap bottle from the close group and how much they would prefer to choose from the apart group on a five point rating scale anchored at 1 with “do not prefer to choose from” and at 5 with “prefer to choose from”.

Results

Analyses were carried out across the symmetric and asymmetric conditions.

Symmetric condition. In the symmetric condition, a economy x domain interaction emerged $F(1, 67) = 65.47$, $p < .0001$. Decomposing this interaction revealed that in the domain of gains, participants preferred to choose more from the close group compared to the apart group ($M = 3.91$ vs. $M = 2.55$, $F(1, 32) = 24.22$, $p < .0001$). But in the domain of losses, participants preferred to choose more from the apart group compared to the

close group (M = 3.47 vs. M = 1.96, $F(1, 35) = 44.52$, $p < .0001$). Table 5 provides detailed results and figure 11 graphs the results.

Source	*df*	*SS*	*MS*	*F*
Between subjects	68	63.71		
Domain	1	9.37	9.37	11.55*
Residual between	67	54.34	0.81	
Within subjects	69	143.41		
Economy	1	0.20	0.20	0.19
Economy X Domain	1	70.78	70.78	65.47*
Error (Economy)	67	72.43	1.08	
Total	137	207.12		

Note. $N = 69$

*$p < .001$

Table 5: Symmetric condition – Experiment 4b

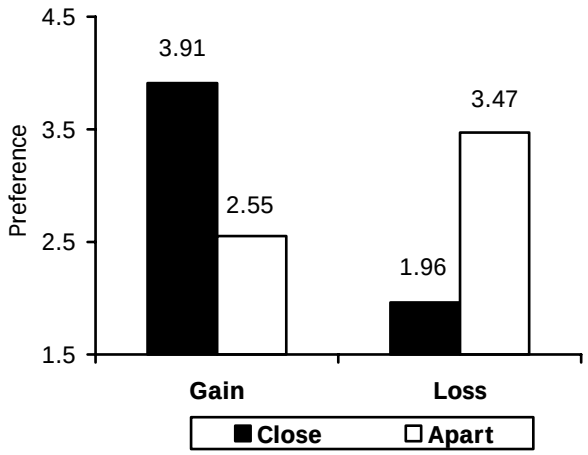

Figure 11: Symmetric condition

Asymmetric condition. In the asymmetric condition, a economy x domain interaction emerged $F(1, 66) = 76.71$, $p < .0001$. Decomposing this interaction revealed that in the domain of gains, the close group was more preferred than the apart group ($M = 3.37$ vs. $M = 1.97$, $F(1, 32) = 37.48$, $p < .0001$), but in the domain of losses, the apart group was more preferred than the close group ($M = 4.01$ vs. $M = 2.5$, $F(1, 34) = 39.65$, $p < .0001$). Table 6 provides detailed results and figure 12 graphs the results.

Source	*df*	*SS*	*MS*	*F*
Between subjects	67	71.97		
Domain	1	11.58	11.58	12.66*
Residual between	66	60.39	0.91	
Within subjects	68	134.15		
Economy	1	0.13	0.13	0.14
Economy X Domain	1	72.04	72.04	76.71*
Error (Economy)	66	61.98	0.93	
Total	135	206.12		

Note. $N = 68$

*$p < .001$

Table 6: Asymmetric condition – Experiment 4b

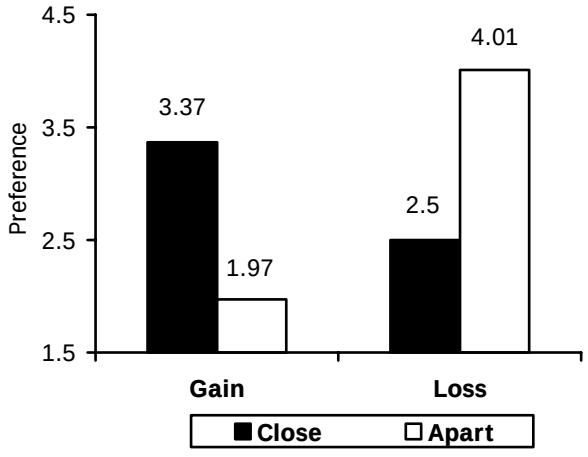

Figure 12: Asymmetric condition

Discussion

The results of experiment 4b demonstrate that the gestalt property of economy can cause the cooler effect. Specifically participants in the domain of gains prefer to choose from the close group over the apart group while participants in the domain of losses prefer to choose from the apart group over the close group. A final analysis was conducted combining the findings of experiments 4a and 4b to study the differential impact of economy and symmetry as they changed from a between to a within subject factor. Symmetry was a within and economy a between subject factor for experiment 4a and economy a within and symmetry a between subject factor for experiment 4b. Thus, one can code for the primary gestalt feature in each experiment (the within subject factor) and whether the secondary gestalt factor (between subject factor) facilitates or hinders the cooler effect. An analysis was run studying the preference for the between and within subject factors for gain and loss. The four way interaction was non significant indicating that the cooler effect is obtained equally reliably and independently by each gestalt feature. While the cooler effect itself was not moderated, there did emerge a domain x primary feature x secondary feature interaction, $F(1, 274) = 14.38$, $p < .0002$, which was suggestive of a shift in responses such that economy as a secondary feature increased preferences overall to a greater degree than symmetry as a secondary feature in gains, while reducing preferences in the domain of losses. However, note that these findings should be interpreted with caution since the null effect (the insignificance of the four way interaction) renders drawing conclusions difficult. Further, other features were varied across the two experiments (4a utilized Pepsi while 4b utilized hand soap).

Experiments 4a and 4b provide a number of findings. First, they demonstrate that both the gestalt property of symmetry and economy can produce the cooler effect providing support for the proposed account that suggests that different gestalt features can produce the cooler effect. Second, they rule out the perceived-distance account. Recall that the contagion only account suggests that gestalt features are unimportant in the cooler effect, which is completely the result of perceived contagion caused by the close/apart grouping. However, the cooler effect is obtained even with the gestalt feature of symmetry, whereas the perceived-distance account would predict indifference. This therefore rules out the perceived-distance account. Third, the experiments rule out the BIS/BAS motivation account that suggest that the close/apart manipulation maps onto approach/avoidance motivations. The cooler effect caused due to the gestalt property of symmetry rules out this account since symmetric/asymmetric grouping does not map on to BIS/BAS motivations. Thus, experiments 4a and 4b together provide support for the first link in the proposed account that gestalt perception is necessary for the cooler effect. However, the proposed account states that gestalt perception and the resultant contagion are needed in conjunction to cause the cooler effect. Experiment 5 was designed to provide evidence for the role of contagion in the cooler effect.

Experiment 5

The proposed account suggests that gestalt features and the resultant feeling of contagion work in conjunction to produce the cooler effect. Experiments 4a and 4b demonstrate the role of gestalt features in the cooler effect. Experiment 5 was designed to illustrate the moderating role of contagion. Different levels of contagion were primed to

moderate the cooler effect. If it were emphasized that contagion does not necessarily lead to a transference of qualities, then people would not believe that any group of products that is perceived as one whole has a higher chance of a quality diffusing across the complete whole. In the absence of this belief, both groups of products, with better or worse gestalt features, would appear to have the same probability of containing the gain product or the loss product. Therefore, people primed with a low contagion prime should show a reduced cooler effect. On the other hand, if the prime emphasizes the idea of increased contagion then people would believe that any group that is perceived as a single whole has a higher chance of transference of good and bad qualities. This enhanced belief in contagion would lead people to demonstrate an increased cooler effect.

Second, the experiment tests the viability of the perceived-numerosity alternate account. The proposed account suggests that a group with better gestalt features forms a better whole and hence facilitates contagion, while a group with worse gestalt features forms a worse whole and hinders contagion. Thus, priming increased contagion would enhance the cooler effect and priming decreased contagion would reduce the cooler effect. The alternate account of perceived-numerosity suggests that groups with better gestalt features form a better whole and influence people's probability estimates – thus, there is no requirement for contagion. A moderation by contagion would serve to rule out this account.

The third objective of this experiment was to show the implication of the cooler effect for retail shelf and store displays utilizing the gestalt property of symmetry. Research has shown that inside a retail outlet the number of rows devoted to a specific product, the height of the shelf from the ground, or the different sizes and brands of the

displayed products influences consumers perception of the product and subsequent purchase intentions (Frank and Massey 1970; Cox 1970). The cooler effect suggests that an asymmetric display would increase product choice if the products have some loss attached to them (for instance clearance items, defective products or end-of-the-season sale items). A symmetric arrangement would increase product choice for gain products containing mail-in rebates, coupons, or gifts.

Prime

The prime consisted of four scenarios given to participants in which, descriptions were provided of either an action spreading to others (increased contagion) or not spreading and remaining isolated (decreased contagion). For instance, the action was of a person laughing and others around too started laughing (or not), one person yawning and others also started yawning (or not), the spread (or not) of word-of-mouth messages about free ice-cream etc. Therefore, the same action (laughing or yawning) depending on whether it was described to spread or not was considered either contagious or not contagious. Thus, the scenario and valence of the primes remained the same for both the primes only the action described was either said to spread or not spread.

In order to ensure that the provided primes actually increased or decreased the level of contagion a pretest was conducted.

Pretest

Ninety one participants took part in the pretest for partial course credit and were randomly assigned to the high or low contagion prime conditions. Participants first read the four scenarios consisting of either high or low contagion primes. After which they did

a word-nonword recognition task. Since the dependent variable was response time the pretest was conducted on a computer. Participants were told that words will appear one at a time on the computer screen and they would have to press "Q" if it is a nonword and "P" if it is word. They were specially instructed to give their response as fast as possible since the task was said to evaluate their speed in recognizing words (Fazio 1990). The computer was used to track the response latency between presenting the stimulus and registering a response. Each participant was shown six high contagion words (spread, pervade, diffuse, mingle, transmit, permeate), six low contagion words (separate, isolate, detached, confine, segregate, limited) and six nonwords (conudrick, cota, helempki, bashitig, donkangh, valcuni).

It was expected that the concept of contagion or spread of qualities would be rendered more accessible for participants who had read scenarios of high contagion while the concept of low contagion or isolation would be made more accessible for participants exposed to the low contagion prime. The design of the pretest was thus a 2 (prime: high contagion vs. low contagion) x 2 (accessibility: high contagion words vs. low contagion words) mixed design, with the first factor being manipulated between subjects and the second within subject.

Logarithmic transformations of the response latencies (Fazio 1990) were subjected to a repeated measures analysis of variance across the prime and accessibility conditions. No differences emerged across the two conditions in terms of the errors made by participants in recognizing the words and nonwords. Data for two participants who made errors was not used in subsequent analysis. As the individual words did not interact with the prime and accessibility factors, $F(5, 83) = .49$, $p > .78$, aggregating across the

response times for words yielded identical results, therefore, the following discussion utilizes mean scores for easier exposition. A significant prime x accessibility interaction was obtained, $F(1, 87) = 31.39$, $p < .0001$. A decomposition of the prime x accessibility interaction revealed that participants primed with high contagion were faster ($M = -.118$) at responding to high contagion words compared to participants primed with low contagion ($M = 0.001$), $F(1, 87) = 9.28$, $p < .003$. In contrast, participants primed with low contagion were faster ($M = -.154$) at responding to low contagion words compared to participants primed with high contagion ($M = 0.062$), $F(1, 87) = 4.96$, $p < .02$. Additionally, no differences emerged in response time across the high and low contagion prime participants for recognizing the nonwords, $F(1, 87) = .37$, $p > .54$). Figure 13 graphs the results of the decomposition of the interaction. Thus, the results indicate that the primes were successful in inducing increased or decreased levels of contagion.

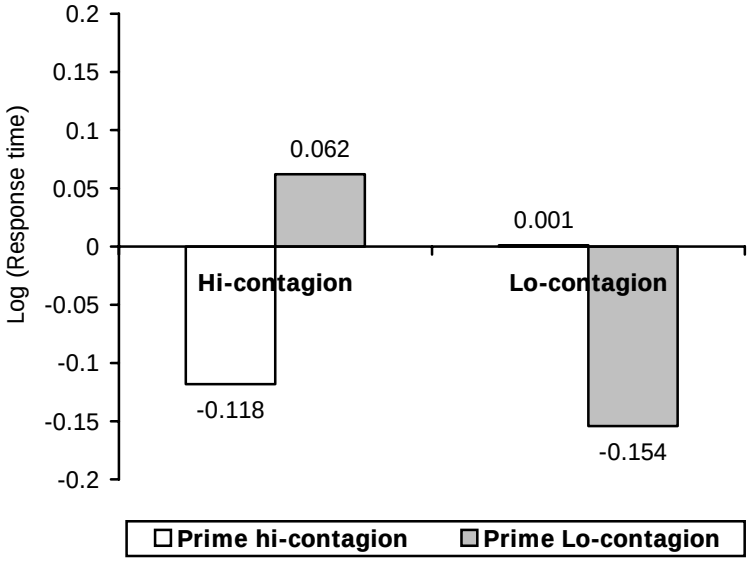

Figure 13: Pretest of the contagion prime

Method

Two hundred and thirty participants took part in the experiment for partial course credit. They were assigned randomly to one of the following six between subject conditions 3 (prime: high contagion vs. low contagion vs. control) x 2 (domain: gain vs. loss). Participants were taken into a room one at a time and shown two groups of ketchup bottles, one group arranged symmetrically and the other asymmetrically. Similar to the procedure used in experiment 1 they were asked from which group they would prefer to choose a ketchup bottle.

Independent variables

Priming manipulation. Participants were first primed by asking them to read the scenarios of high or low contagion or assigned to the control condition. The scenarios were the same that were pretested.

Spatial Grouping. To manipulate spatial grouping, two groups each containing nine ketchup bottles were shown to the participants, in one group the bottles were grouped symmetrically (symmetric group) and in the other group the bottles were grouped asymmetrically (asymmetric group).

Loss versus Gain. In the loss domain, participants were told that one ketchup bottle, of the nine displayed, had a defective lid which causes the ketchup to splash all over the place when it is poured out. However, it is not known which one of the nine bottles is defective. Picking the defective bottle would entail a loss of $3 which is the price of the bottle since this bottle would not be usable. In the gain domain, participants were told that one bottle, of the nine displayed, has a bottle that contained a coupon for

$3. Again, it is not known which of the nine bottles had the gift coupon. Participants were told that one bottle in each group has a gift coupon.

Dependent variable

Participants were asked from which group of ketchup bottles they would like to choose a ketchup bottle. They indicated on a five-point scale with 1 indicating a preference to choose from the asymmetric group, 3 indicating indifference and 5 indicating a preference to choose from the symmetric group. Gender data was collected to observe any differences across gender for the cooler effect.

Results and Discussion

The analysis revealed a prime x domain interaction, $F(5, 224) = 18.80$, $p < .0001$. A decomposition of this interaction showed that the cooler effect emerged in the control condition. Participants assigned to the gain domain preferred to choose from the symmetric group ($M = 3.48$) while those in the loss domain preferred to choose from the asymmetric group ($M = 2.47$), $F(1, 74) = 11.11$, $p < .001$. Those primed with high contagion demonstrated an enhanced cooler effect. They indicated a greater preference to choose from the symmetric group in the gain domain ($M = 4.11$) and a greater preference to choose from the asymmetric group in the loss domain ($M = 1.86$), $F(1, 76) = 95.76$, $p < .001$. However, for those primed with low contagion the cooler effect did not emerge with no difference appearing in preferences in the gain or the loss domain ($M = 3.07$ vs. $M = 2.94$), $F(1, 74) = .51$, $p > .47$. Further, no gender differences emerged across conditions. Table 7 provides detailed results and figure 14 graphs the moderation by contagion.

Source	*df*	*SS*	*MS*	*F*	R^2
Domain	1	73.46	73.46	63.80*	0.19
Prime	2	0.03	0.01	.02	0.00
Domain X Prime	2	43.28	21.64	18.8*	0.11
Within groups	224	257.91	1.15		
Total	229	376.01			

Note. $N = 230$

*$p < .001$

Table 7: Experiment 5

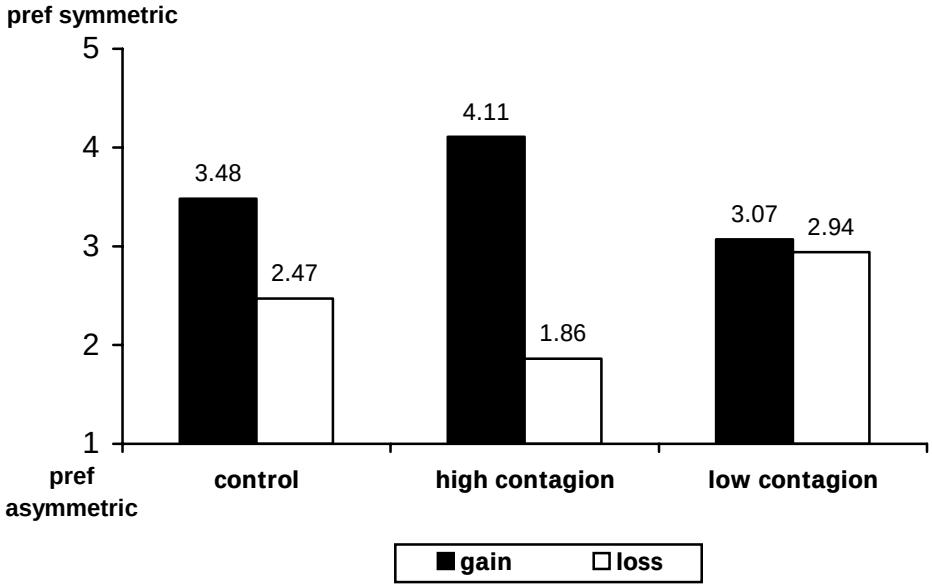

Figure 14: Moderation by contagion prime

The enhanced cooler effect for participants primed with high contagion and reduced cooler effect for those primed with low contagion rules out the perceived-numerosity account, since according to this account, contagion has no role and hence, moderation by contagion should not occur. Thus, the experiment demonstrates the moderating role of contagion in the cooler effect and rules out the alternate account of perceived-numerosity.

CHAPTER 6: GENERAL DISCUSSION, IMPLICATIONS AND THEORETICAL CONTRIBUTIONS

General Discussion

The thesis demonstrates a new phenomenon called the cooler effect. It suggests that in the domain of gains, people prefer choosing from a group that has products arranged with better gestalt features, like economy, similarity, or symmetry. A preference reversal occurs in the loss domain with greater preference for groups with products arranged with poor gestalt features.

A theoretical process is proposed to explain the underlying mechanism of the cooler effect that combines findings on gestalt theory of perception and contagion theory. Specifically, it is proposed that when a group is perceived as a gestalt whole it facilitates a higher sense of contagion and transference of good or bad qualities within the same whole. Thus, in the domain of gains people prefer the group with better gestalt features since the gain appears more pervasive. In contrast, when a group is not perceived as a whole and its individual parts appear more salient it hinders the sense of transference of good or bad qualities within the group. Thus, in the domain of losses people prefer the group with worse gestalt features and hence lower contagion, since the quality of loss does not seem to spread as much. Experiment 1 demonstrates the cooler effect in a product choice domain while experiment 2 replicates it in a game of chance. Experiment 3 was designed to show that the cooler effect is used as a heuristic and is enhanced under cognitive load. Experiments 4a and 4b demonstrate the influence of two different gestalt

features, economy and symmetry, on the cooler effect. They also serve to rule out the alternate accounts of perceived-distance and BIS/BAS motivation. Finally experiment 5 primes high and low contagion to provide support for the proposed account and rules out the alternate account of perceived-numerosity.

The findings of the thesis have both theoretical and practical implications, which are briefly discussed in the next section.

Theoretical contributions

Gestalt theory has been extensively studied in cognitive psychology. Although it is generally considered to have perceptual underpinnings, gestalt theory has been extended across various domains. The findings of the dissertation add to this field in two different ways. First, the experiments show the differential influence of gestalt features of a group (like similarity, symmetry or economy) on choices and preferences in the domain of gains and losses. Gestalt perception causes people to choose an option that would not be predicted by normative probability theory. Second, the thesis demonstrates that a group perceived to have better gestalt features increases the perceived contagion among the objects in the group. That is, groups with better gestalt seem more contagious than groups with poor gestalt features. The moderating role of gestalt features on the level of contagion would be among the first of such studies.

Contagion has been studied across different tasks and across cultures. The findings in the dissertation add to this literature by showing that higher or lower perceived contagion leads to a preference reversal in the domain of gains and losses. Consumers sometimes make decisions based on limited knowledge and information. They need to go beyond the information provided and form inferences about certain

properties of a product, which require an if-then linkage between information (cues, heuristics, knowledge, arguments) and the final decision (Sanbonmatsu, Kardes, Posovac and Cronley 1997; Wyer and Srull 1989). In those instances when consumers need to make inferences from the situationally available information (i.e., based on the stimulus) the cooler effect suggests that the spatial grouping of the products acts as a cue that makes consumers behave differently in the domain of gains and losses. The spatial cue is a non-informative cue which is incorporated by people in making product selection decisions thus the findings add to literature on the use of irrelevant information in making choice and decisions (Meyvis and Janiszewski 2002).

Practical implications

Advertising Claims. Advertisements and public policies messages depicts products, people or objects in their message. Groups depicted in such messages have the potential to influence people's perception of the message. If the advertisement message needs to increase peoples' perceived contagion then groups with good gestalt features should be depicted (for instance similar or proximal groups). On the other hand, if the message wants to convey a feeling that things do not spread but remain isolated then the advertisement might depict groups arranged with poor gestalt. Implications hold for the insurance sector. For instance, people may buy more travel insurance, accident plans, or preventive plans if messages depict groups with better gestalt and hence greater contagion, causing people to think that they are more susceptible to the vagaries of nature.

Retail decisions. Product arrangement has been of concern to retailers and managers for a long time, especially given the supercenters that carry several brands and

products. Research has shown that inside a retail outlet the number of rows devoted to a specific product, the height of the shelf from the ground, or the different sizes and brands of the displayed products influences consumers perception of the product and subsequent purchase intentions (Frank and Massey 1970; Cox 1970). Additionally, a majority of consumer decisions take place within the store with information being processed in a more bottom-up manner (Hoch and Deighton 1989) and most purchases being unplanned and spontaneous (Dreze, Hoch , and Perk 1994). In such a situation, displays and product groupings are some of the external cues that can influence consumer buy-no buy decisions. The cooler effect has implications for product placement in retail shelves. Products with gains attached to them should be arranged to form better gestalts (e.g., more symmetrically), but products with some loss (for instance clearance or defective items) should be placed in dissimilar groups.

Brand Associations. The cooler effect suggests that whenever a brand has a good image then it should be grouped together with its brand extensions and accessories so that the positive image from the good brand name can spread better to the accessories. In contrast, a brand with some negative quality (for instance, Bausch and Lomb contact lens cleaners after the product recall) should segregate their brand (e.g., sort by product, rather than by brand) and place them with other brand names so that the negative quality form the contact lens cleaner does not spread to other Bausch and Lomb products. Similarly, it may help to arrange disgusting products in groups with worse gestalt so that their disgusting aspects do not spread.

Healthy Consumption. Getting people to eat healthy food has been an uphill task since the general perception is that healthy food is not tasty. The cooler effect suggests

that if one item in a group is said to have a prominent good or bad quality then it is likely that the whole group will be perceived to have that quality. The stronger the perception of the group, the greater the perceived spread of qualities. Thus, if on a menu a tasty food, like ice cream, is added to a group of healthy food the quality of tastiness is likely to spread across the whole group increasing people's likelihood of sampling from the healthy food section.

Limitations and future directions

The cooler effect can be studied in the area of entitative groups. Campbell (1958) coined the term "entitativity" to refer to group perception based on gestalt notions of proximity, similarity, collective movement, and common fate. Highly entitative groups are considered more cohesive and associated with prototypic representations, whereas low entitative groups result in more exemplar-based representations (Brewer and Harasty 1996). Stereotypes are held strongly for highly entitative groups and spread faster in them. Therefore, the cooler effect would suggest that entitative groups are likely to be preferred when gains are associated – for instance you want to be part of a group that is achieving success. However, low entitative groups would be preferred in the time of losses. Studies exploring the perceived contagion on entitative groups will provide more insights into the joint workings of these two disparate theories.

There is a possibility that the cooler effect may be occurring at a more non-conscious level. However, the current set of studies do not explicitly test for it. Further studies would shed more light on its conscious versus non-conscious nature. In the experiments presented in this thesis, groups of products or objects were generally nine or

sixteen per group. Future studies could investigate the influence of increasing or decreasing the number of members in a group on the resultant feeling of contagion. Such studies would provide insights into how number of units in a group influence its entity as a group.

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