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Distorted evaluative space: the theory of relativity in evaluative judgment

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University of Iowa

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DISTORTED EVALUATIVE SPACE: THE THEORY OF RELATIVITY IN
EVALUATIVE JUDGMENT

by

JaeHwan Kwon

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 2015

Thesis Supervisor: Associate Professor Dhananjay Nayakankuppam

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CERTIFICATE OF APPROVAL

PH.D. THESIS

This is to certify that the Ph.D. thesis of

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has been approved by the Examining Committee for the
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Dedicated to my wife, Jeanhee, who has shown her endless love, understanding, and support over the course of my Ph.D. program; my precious 2-year-old son, Dylan, who has shown his smile to me every day, which has provided me with endless energy and emotional support; and my parents, Byungok Kwon and Meehee Yu, who have never doubted me and who have provided me with their unconditional love and endless support throughout my life.

Logic will get you from A to B. Imagination will take you everywhere.

- Albert Einstein

ABSTRACT

Attitude theory and the judgment literature to date have typically focused on consumer evaluations regarding products/brands delivered in isolation, a situation that consumers rarely face. Moreover, most research on the context effect has focused only on the case of pair evaluation: the role of one object serving as a context when making judgments of another object, a case that is not very common in real-world situations, either. The current research tackles the more complex (but more realistic) question of consumers' multiple-object evaluations and provides a more holistic view of context effects. Specifically, I focus on the context effect created by an object associated with a strong attitude on the subsequent evaluative judgment of multiple target objects. Through five studies, I find that the context effect of a strong attitude object is greater for objects with neutral-strength attitudes than for the objects with very strong or very weak attitudes, which results in a curved relationship between the magnitude of the context effect and the strength associated with attitudes toward targets. In addition, I find that the direction of the context effect of a strong attitude object is determined by the valence of the attitudes toward the target objects: targets with positive attitudes become less positive, and those with negative attitudes become less negative. That is, the results of the context effects represent a form of decreased extremity of attitudes toward targets. More importantly, it is found that these differing magnitudes and directions of the context effect of an object with a strong attitude finally result in evaluative space distortion. I trace the underlying process mechanism of these effects and find that: 1) the divergent magnitudes of the context effects are the result of the differing level of comparison difficulty between a contextual object and target

objects; and 2) the divergent directions of the context effects are the product of perceived uncertainty about the attitude toward target objects.

PUBLIC ABSTRACT

People hold attitudes toward nearly everything around them, and they hold these attitudes either strongly or weakly in their mind. Strongly held attitudes are beneficial in our lives. Actually, it is difficult to imagine life without strong attitudes. Without them, we would re-evaluate things that we encounter every day from scratch; strong attitudes help us easily reach daily judgments and decisions so that we can live more efficiently.

In the current research, however, I propose that a strong attitude is not always functionally beneficial. Through five experiments, I find that strongly held attitudes toward specific brands or products can distort one's evaluations on other products and brands. For example, if an individual has a strong attitude toward Samsung, his or her evaluations toward other brands, such as Sony and LG, would vary, depending on whether or not the individual happened to encounter Samsung products before evaluating Sony and LG. Thus, an individual's evaluations of the products/brands toward which his or her attitudes are held relatively weakly can vary by situation.

An interesting finding in the current research is that this variation is greater in neutral-strength attitudes rather than in very weak attitudes. For example, the presence of Samsung is likely to distort one's evaluations more toward Sony or LG rather than toward other unfamiliar, or never-heard-of-before brands.

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Chapter 1. Introduction

Human judgment is *always* context-dependent; in essence, context-free judgments do not exist.

– Sudman, Bradburn, and Schwarz, 1996, p.81

Consumers rarely face situations in which they need to evaluate a single product/brand in isolation: rather, multiple products/brands are likely to be encountered and considered together. Whether reading consumer reviews on the Internet or trying out a product/brand first-hand in an offline store, consumers often encounter other alternatives, making it difficult for them to isolate the evaluation of a single product/brand alone (Herr, Sherman, and Fazio 1983; Tormala and Clarkson 2007, 2008; Tormala and Petty 2005). Instead, the presence of other products/brands often leads them to evaluate a target product in the context of those similar products encountered before and/or during the evaluation, which may often lead to biased evaluations of the target product. For example, a consumer's evaluative judgment of a *Galaxy* after an *iPhone* may be different from his/her judgment of the *Galaxy* phone in isolation.

In consumer evaluative judgment and attitude research, however, the role of previously encountered products (i.e., contextual objects) on the evaluation of a current object in question (i.e., a target object) has been largely overlooked: namely, the context effect. A typical paradigm in the evaluative judgment and attitude literature presents participants with a single product/brand in isolation, along with varied attribute information depending on experimental conditions, and asks them to evaluate and report their attitudes toward the product/brand in question (Tormala and Clarkson 2008). Although little is known about how consumer evaluative judgments are expected to occur in presumably more real-world situations, where a target product is evaluated in the context of other product(s), research on attitude strength suggests that

the strength associated with the attitude toward the target may play an important role in these multiple-object situations. It is well-established that compared to weak attitudes, strong attitudes are more stable, persist over time, and resist counter persuasion attempts (see Fazio 1995; Petty and Cacioppo 1986; Petty, Haugtvedt, and Smith 1995), all of which suggest that strong attitudes are less likely to be influenced by contexts. As such, the extent to which the evaluation of a target object is affected by the context created by preceding objects may be determined by the strength associated with one's attitude toward the target. Thus, it is plausible that the extent to which the evaluation of a *Galaxy* phone is affected by the presence of an *iPhone* may be dependent on how strong one's pre-existing attitude is toward the target – the *Galaxy* phone.

Still elusive is the answer to the question of what the role could be of the strength associated with the attitude toward the *iPhone* in this situation. Is the strength likely to determine the extent to which the context effect of the *iPhone* influences the evaluation of the *Galaxy*? Surprisingly, almost nothing is known about the role of the strength associated with the attitude toward a contextual object in context effects. Therefore, it is taken for granted that nothing is known about the possible interaction, if any, between the strength associated with the attitude toward a context and that associated with the attitude toward a target in context effects.

The current research examines the role of the attitude strengths of both a context and a target on the context effect, focusing on the interaction between the strengths. I show that the context effect is likely to occur only when the strength associated with the attitude toward a contextual object is greater than that associated with the attitude toward a target object *plus* when the difference between these strengths is not too great or not too small.

To illustrate these cases, I introduce, in the next section, the novel concept of the (imaginary) evaluative judgment “plane” and draw two different evaluative judgment planes – one mapping

only the evaluative judgments made *without* a contextual object (i.e., context-free judgments) and the other mapping only those made with a contextual object (i.e., context-influenced judgments) – in order to compare these two planes and to show how context effects can “distort” the original evaluative judgment plane (the one without context effects). To better elucidate the nature of the evaluative judgment plane and its distortion, I organize the rest of the manuscript as follows. The next section outlines the two major components of an evaluative judgment – attitude and attitude strength. This will be followed by an explanation of how the evaluative judgment plane has been conceptualized and how the two components of evaluative judgments can be mapped on this plane. I then review the context effect literature and develop my conceptualization of how and why attitude strength can play a role in context effects, along with a discussion of why the original evaluative judgment plane can be distorted by context effects. I then report the results of five studies supporting my contentions.

Chapter 2. Conceptual Background

2.1. Evaluative Judgment Plane

The core proposition of the current research is that every evaluative judgment one makes can be mapped onto an X–Y plane, where the X–axis denotes attitude and the Y–axis denotes attitude strength (i.e., the strength associated with the attitude). That is, an individual’s evaluative judgment of an object can be divided into two factors: how much one likes or dislikes the object (i.e., attitude) and how strongly one holds these attitudes (i.e., attitude strength). I first review the relationship between these two constructs.

2.1.1. Attitude Strength

Attitudes are typically conceptualized and measured as lying along a bipolar continuum ranging from positive/favorable/good to negative/unfavorable/bad (Priester et al. 2004). To the extent that one evaluates an object closer to either endpoint of the scale, the more extreme the attitude can be thought to be. It has long been believed that the more extreme attitudes are more likely to guide subsequent judgments and behaviors (Allport 1935). Recently, however, a considerable amount of research finds that seemingly equivalent attitudes on the scale (i.e., those marked on the same evaluation point) often vary in the extent to which they influence one’s judgments and behaviors. The construct of attitude strength is proposed to capture this variance (Kwon and Nayakankuppam, 2015) – how strongly an attitude has been structured and is held in one’s mind, presumably represented in one’s memory. The notion that the strength associated with an attitude moderates the influence of the attitude on subsequent behaviors has become a fundamental principle of attitude and persuasion research (Fazio 1995; Kwon and Nayakankuppam 2015; Petty, Haugtvedt, and Smith 1995; Petty and Krosnick 1995; Priester et

al. 2004; Sawicki et al. 2011). As such, two attitudes marked on the same point of the attitude scale can differ by their underlying strengths associated with the attitudes, such that one attitude is strongly held while the other attitude is weakly held in one's mind; that is, one possesses a "strong" +3, and the other possesses a "weak" +3. Although these two attitudes appear to be the same, as measured by traditional attitude scales, the stronger attitude is more likely to guide subsequent thoughts (e.g., Houston and Fazio 1989) and behavior (e.g., Fazio, Powell, and Williams 1989) than the weaker attitude (e.g., Petty, Haugtvedt, and Smith 1995; Priester and Fleming 1997; Priester et al. 2004). Although attitude strength has been found to be somewhat correlated with attitude extremity (Krosnick et al. 1993), there is a considerable amount of agreement among attitude researchers that strength is an independent, distinct construct from attitude extremity (Fazio 1995; Kwon and Nayakankuppam 2015; Priester et al. 2004).

It is a well-established notion that attitude strength is a latent, multidimensional construct. The literature has documented that compared to weak attitudes, strong attitudes are likely to be more certain, more stable over time, more accessible, more resistant to counter persuasions, and more predictive in guiding behavior (e.g., Fazio 1995; Petty and Cacioppo 1986; Petty, Haugtvedt, and Smith 1995; Priester et al. 2004; Sawicki et al. 2011). Although they are not equivalent qualities to each other (for e.g., Petrocelli, Tormala, and Rucker 2007), all of the above are thought to be related to each other and are considered as defining qualities of strong attitudes. Thus, attitude strength can be inferred and captured by multiple operationalizations and/or measures of those attributes associated with the attitude. In the proposed research, I adopt such an approach herein and assess attitude strength with multiple measures (e.g., attitude certainty and attitude accessibility).

2.1.2. Mapping Attitude/Attitude Strength on the Evaluative Judgment Plane

As discussed, attitudes marked on the same point of the traditional bipolar scale can differ on the orthogonal dimension of attitude strength. Imagine that an individual reports his/her attitudes toward *Pepsi* and toward *Sprite* both at +3, respectively, on a -4 (extremely negative) to +4 (extremely positive) bipolar attitude scale, but that s/he is very certain about his/her attitude toward *Pepsi* (i.e., strong attitude), whereas s/he is not quite certain about his/her attitude toward *Sprite* (i.e., weak attitude). According to the attitude strength literature, compared to his/her attitude toward *Sprite*, his/her attitude toward *Pepsi* is more likely to be stable, accessible, and predictive of guiding his/her choice of *Pepsi* over *Sprite*. In such a case, the two seemingly identical attitudes on the attitude scale can be split out on the orthogonal dimension of strength. For example, right after answering attitude questions, the individual can be asked to report how certain s/he is about his/her attitudes toward *Pepsi* and *Sprite*, respectively, on another -4 to +4 bipolar scale, anchoring “very uncertain” in -4 and “very certain” in +4. Consequently, for each evaluative judgment, an ordered pair of extremity and certainty (i.e., strength) can be collected and plotted on the X-Y (attitude-attitude strength) evaluative judgment plane, which is composed of the four quadrants: strong-positive, strong-negative, weak-negative, and weak-positive (see Figure 1). As such, the individual’s evaluative judgment on *Pepsi* can be plotted in the 1st quadrant, whereas his/her judgment on *Sprite* can be plotted in the 4th quadrant. In the current research, an individual’s evaluative judgment is conceptualized with two independent, distinct attitude constructs: how much does one like or dislike the object (i.e., attitude extremity), and how strongly does one hold the attitude (i.e., attitude strength)?

Imagine that not only are evaluative judgments of *Pepsi* and *Sprite* measured, but also those involving a rich number of other brands in the soda product category, and that all of them are

plotted on the plane. Assuming that they are distributed well all around the four quadrants and that the distance between each point is close enough for the plane to look quite packed, the connections of those points will generate a square-shaped space. I refer to this space as the evaluative judgment plane for soda brands. This is how I define the evaluative judgment plane of a product category in the current research.

2.2. Context Effect

2.2.1. The Direction of the Context Effect

In general, context effects can be assimilative or contrastive in nature (Tormala and Clarkson 2007; Tormala and Petty 2005; see Sudman, Bradburn, and Schwarz 1996, for a review). The assimilation effect refers to a positive relation between the judgments of a target object and of a contextual object preceding the target, the situation in which an individual's evaluative judgment of the target shifts toward the contextual object; in contrast, the contrast effect refers to the negative relation between the judgments of a target and of a context, where an individual's evaluative judgment shifts away from the context (Martin, Seta, and Crelia 1990). It is important to note that the key distinction between assimilation and contrast effects comes from the *direction* of the shifts.

A line of research on context effects has identified numerous determinants of assimilation versus contrast. For example, the contrast effect is more likely than the assimilation effect to emerge when the standard of comparison (i.e., contextual object) is extreme compared to moderate (Herr 1986; Herr, Sherman, and Fazio 1983; Moskowitz and Skurnik 1999; Mussweiler, Ruter, and Epstude 2004; Sherif and Hovland 1961); when the representation of the target of judgment excludes rather than includes the standard (Schwarz and Bless 1992; Sudman,

Bradburn, and Schwarz 1996); when the target is unambiguous rather than ambiguous (Herr, Sherman, and Fazio 1983; Pelham and Wachsmuth 1995); when the context is an exemplar as opposed to a category (Dijksterhuis et al. 1998; Schwarz and Bless 1992; Stapel, Koomen, and van der Plight, 1997); when a dissimilarity mindset (i.e., focusing on finding differences between a standard and a target) is activated/primed rather than a similarity mindset (i.e., focusing on similarity; Markman and McMullen 2003; Mussweiler 2003; Sherif and Hovland 1961; Tormala and Clarkson 2007); and when a target and a context are presented successively rather than simultaneously (Martin and Seta 1983; Wedell, Parducci, and Geiselman 1987). Note that, however, no research to date has yet examined the attitude strength of a contextual object as a possible determinant of assimilation versus contrast.

2.2.2. The Magnitude of the Context Effect

An individual can judge a target person to be more or less hostile, depending on whether the target is judged in comparison to Pope John Paul II or Adolf Hitler (Herr 1986). The rich history of research on context effects over the years has been devoted to understanding the *direction* (i.e., assimilation vs. contrast) of this context effect (Tormala and Clarkson 2007). Surprisingly, however, there has been little discussion about the *magnitude* of the context effect: the extent to which the evaluation of a target shifts toward or away from a context.

In Herr (1986)'s study, the target person being evaluated was not a stranger, but someone who was well known, such that the subjects already had pre-existing attitudes of the target before the experiment. As previously stated, compared to weak attitudes, strong attitudes are more stable and resistant to counter persuasion attempts. As such, the magnitude of the context effect created by a comparison to Pope John Paul II or Adolf Hitler would vary as a function of the

strength associated with each subject's existing attitude toward the target person. As an extreme case, there may even be no context effect detected (i.e., too small to be represented on a traditional questionnaire scale) if a subject had very strongly held existing attitudes toward the target person. In contrast, if the subject had very weakly held attitudes toward the target, the magnitudes of the context effects would likely be large. Note that attitude strength is not a dichotomous concept, but rather a continuum ranging from very strong to very weak. Likewise, it is plausible that the magnitude of the context effect can fall somewhere along the continuum, depending on how strongly one's existing attitude toward a target is held. In this proposed research, I test this idea – whether the magnitude of the context effect varies, depending on the strength associated with an individual's pre-existing attitude toward a target. Specifically, I hypothesize that the magnitude of the context effect on the target with a strong attitude is smaller than on that with a weak attitude. In addition, the current research also examines whether the extent of the context effect varies by the strength associated with the attitude toward a *contextual* object – whether or not a stronger attitude toward the contextual object (irrespective of the valence of the attitude) yields a greater context effect than a weaker attitude toward the contextual object. More importantly, I explore the interaction effect of these two strengths on the magnitude of context effects.

In sum, this proposed research examines the relationship between the context effect and the strengths with which the two attitudes are held (one toward a contextual object and another toward a target object). In particular, this research explores both aspects of the context effect: magnitude and direction. First, I examine whether the magnitude of the context effect varies as a function of the strength associated with one's attitude toward a context, toward a target, and/or the interaction of the two strengths. Second, I explore the direction of the context effect

(assimilation vs. contrast) in each situation (e.g., when the attitude strength of a context is greater than that of a target).

Chapter 3. Conceptual Framework and Proposition

To illustrate each case where two objects are being evaluated (one as a context and the other as a target), recall our previous discussion on the X–Y (attitude–attitude strength) evaluative judgment plane. To a large extent, we can conceptualize nine types of attitude objects with distinctive qualities on the plane: ranging from strong, neutral-strength, to weak attitudes on the Y–axis and from positive, neutral, to negative on the X–axis (see Figure 2). We can conceptualize each situation by picking two (one as a context and the other as a target) out of these nine types of attitudes.

3.1. The Complexity of Context Effects

Imagine that an individual is asked to report his/her attitude toward *Coke* on a –4 (very negative) and +4 (very positive) bipolar attitude scale and marked on +3 for *Coke*. After a sufficiently long time delay, enough for his/her memory to be cleared out, s/he is asked to report his/her attitude toward a different soda brand, say, *Pepsi*, and s/he marks –3 for *Pepsi*. Now, suppose that this procedure has been slightly tweaked: everything remains the same, but the time delay has been removed. That is, s/he is asked to report his/her attitude toward *Pepsi* right after s/he has reported his/her attitude toward *Coke*, and thus, the evaluation of *Pepsi* is likely to be influenced by the context effect of *Coke*. In this case, would s/he give the same rating for *Pepsi* as s/he did in the previous situation (i.e., –3)? My predicted answer for this question is yes and no – it is dependent on the relationship between the strength associated with the attitude toward *Coke* and the strength associated with the attitude toward *Pepsi*. The attitude toward *Coke* was +3, and the *original* attitude toward *Pepsi* was –3 (i.e., when measured after a time delay sufficiently long enough to be free from the context effect of *Coke*). This seemingly single case

(i.e., a case where a contextual product has a positive attitude and a target has a negative attitude) can be possibly divided, to a large extent, by a total of nine different underlying cases when the strengths associated with these two attitudes are considered: 3 (for *Coke*: A₁ vs. A₄ vs. A₇ in Figure 2) by 3 (for *Pepsi*: A₃ vs. A₆ vs. A₉ in Figure 2). As such, the answer for the question of the likelihood of the context effect in this seemingly single case may not be simply either yes or no. Rather, it could be yes in some underlying cases, but no in other underlying cases.

Given that there could be at least nine different types of attitudes (i.e., A₁ through A₉ in Figure 2), one could consider a minimum of eighty-one (nine by nine) possible cases in the investigation of the context effect concerning both attitude and attitude strength. Instead of looking into every single case every time, I attempt to develop four rules of thumb in context effects, which may be applicable to all eighty-one cases in the evaluative judgment plane, and thus, may provide a holistic view of how the plane can be distorted by the seemingly irregular, but predictable patterns of context effects in different cases.

3.2. The Likelihood/Magnitude of Context Effects

Recall the previous discussion about the characteristics of strong attitudes: they are not only stable, but also readily accessible (see Fazio 1995, for a review). Research has documented that strong attitudes are stored in one's memory as a ready guide for action (e.g., Eagly 2007; Eagly and Chaiken 1993; Fazio 1995; 2007). The core of this notion is that this summary evaluation stored in the memory (i.e., a strong attitude) is readily retrieved when the attitude object is encountered, rather than when an evaluative judgment is constructed every time anew. As such, a strong attitude is believed to be stable over different times and contexts. Therefore, if the existing attitude toward a target is strong (i.e., A₁, A₂, or A₃ in Figure 2), the evaluative judgment of the

target is not, or is less likely to be influenced by the context effect of a preceding contextual object, no matter whether the strength associated with the attitude toward the exemplary is strong, neutral-strength, or weak. Thus, I hypothesize that:

H₁: Target objects with strong attitudes are less likely to be influenced by context effects.

Now, what if a strong attitude is placed to serve as a context? I expect that this is the case where the attitude strength of a *target* object comes into play. Specifically, I propose that the magnitude of the context effect of a strong attitude object may be moderated by the strength associated with the attitude toward a target. To a large extent, we can imagine three different cases – the target has: a strong attitudes (e.g., A₁, A₂, or A₃ in Figure 2); a neutral–strength attitude (e.g., A₄, A₅, or A₆); and a weak attitude (e.g., A₇, A₈, or A₉).

First, as discussed already, when an object with a strong attitude is evaluated as a target, I predict that it is not likely to be influenced by the context effect of a preceding object with a strong attitude, since the attitude toward the target will be directly retrieved from one’s memory.

Second, when an object with a weak attitude is evaluated as a target, I expect the same results as when an object with a strong attitude is evaluated as a target—the target is not likely to be influenced by the contextual object with a strong attitude—but by different underlying processes. A considerable amount of research has documented that weakly held attitudes are not readily accessible, such that one is likely to retrieve in his or her memory some attribute information associated with the object in order to construct his or her evaluative judgments at the time of questioning (e.g., Bettman, Luce and Payne 1998; Lord and Lepper 1999; Schwarz 2004; Schwarz and Bohner 2001; Smith and Collins 2009). As such, the psychological processes

underlying evaluative judgments based on strong attitudes and on weak attitudes are fundamentally different: that is, evaluative judgments associated with strong attitudes are the result of *retrieval* processes (i.e., stored evaluations (i.e., attitudes) are directly retrieved and used to guide such judgments), whereas evaluative judgments associated with weak attitudes are the result of *online construction* processes based on accessed attribute information (Nayakankuppam and Priester 2009). In other words, the core of the difference in these psychological processes is that a stored *attitude* is likely to be retrieved in one's memory when encountering an object with a strong attitude, but *attribute information* is likely to be retrieved when encountering an object with a weak attitude. That is, the types of information retrieved from one's memory are likely to differ between objects with strong and weak attitudes. Thus, when a contextual object has a strong attitude and a target object has a weak attitude, the retrieved information associated with the contextual object is not likely to provide any attribute-level information about the contextual object, which could have influenced the evaluative judgment of the target in the process of constructing the evaluative judgment of the target with a weak attitude. In other words, the levels of information retrieved in one's memory are different between the context and the target, such that there would be little information to "compare" the target with the context at the attribute level. Hence, I predict that weak attitude objects are less, if at all, likely to be influenced by the context effect of strong attitude objects.

Third, when an object with a neutral–strength attitude is evaluated as a target (e.g., A₄, A₅, or A₆ in figure 2; those in the mid-range of the vertical axis of the evaluative judgment plane), this is where I expect the context effect of a strong attitude object to most likely emerge. This type of attitude is not completely weak: rather, it is likely to hold a certain level of sufficient strength that the stored attitude can retrieve, even though it is not readily accessible, and thus may take

more time to recall. Thus, the two objects (a contextual and a target object) can be compared at the same level (i.e., attitude level) of retrieved information, such that the evaluative judgment of the target object may be influenced by the context effect of a contextual object with a strong attitude.

Taking all three cases together, I predict that the likelihood of the context effect when a contextual object has a strong attitude will be determined by the strength associated with the attitude toward a target – no, or fewer, context effects for target objects with either strong or weak attitudes; just for those with neutral-strength attitudes. Although we have discussed only three cases, given that attitude strength is not a discrete concept, but rather a continuum ranging from very strong to very weak, I propose that the *magnitude* of the context effect is determined by the strength associated with the attitude toward a target. Significantly speaking, however, I expect a non-linear, inverted U-shaped relationship between the strength associated with the attitude toward a target and the magnitude of the context effect. Specifically,

H₂: When the strength associated with the attitude toward a contextual object is strong, the magnitude of the context effect will be greater for a target with a neutral–strength attitude than for a target with either a strong or weak attitude.

Now, consider the case where a weak attitude object serves as the context. In contrast to strongly held attitudes, weakly held attitudes have been found to be perceived as less certain and less confident (e.g., Petrocelli, Tormala, and Rucker 2007; Petty and Cacioppo 1986; Petty, Haugtvedt, and Smith 1995). Thus, given that it is difficult for a less certain evaluative judgment to play a role in the formation of a more certain judgment, it is doubtful that a contextual object

with a weak attitude can yield any context effects on target objects with stronger attitudes than itself. Hence, I predict that:

H₃: A contextual object with a weak attitude will not yield any context effects.

3.3. The Direction of the Context Effect

When a context effect emerges, how does it represent itself on the evaluative judgment plane? Recall the previous discussion that a contextual object with a weaker attitude cannot yield any context effect to a target with a stronger attitude than itself. Conversely, if a context effect is observed, we may conclude that the attitude toward the context was greater than the existing attitude toward the target. That is, it is plausible that a context effect can occur *only* when an individual realizes that s/he is less certain or less confident (i.e., less strong) about his/her pre-existing attitude toward a target than that toward a context *and* s/he feels the needs to “adjust” his/her pre-existing attitude toward the target. Then, how can this perceived smaller certainty be represented in the evaluative judgment of a target? I propose that it can be reflected in either, or both, attitude strength and/or attitude extremity measures. First, it can be directly indicated as a lower rating in the attitude strength measure than the rating it would be when there is no context effect. Second, it can also be reflected as a decreased rating on the attitude scale, indicative of a less extreme attitude. For example, imagine that one’s “original” attitude toward a target is +3 and that s/he has just realized that s/he is not certain about this attitude. S/he may say, “Oh, now I am not confident about my attitude [+3 on the attitude scale]. Although I know I like this brand, I may not like this brand as much as I thought.” In this case, the rating on the attitude scale will be adjusted either to +1 or +2 (i.e., decreased extremity). For negative attitudes, the same thing may

happen – less extreme attitude ratings (for e.g., –3 to –1). That is, perceived smaller certainty can be reflected in such a way that positive attitudes become less positive, and negative attitudes becomes less negative. Note that here, both valences of attitude “move” toward the neutral point of the attitude scale; thus, the directions of movement are the opposite – positive attitudes move toward the left-hand side, and negative attitudes move toward the right-hand side.

H₄: When a context effect emerges, the attitude extremity of a target will decrease, which will be reflected on the attitude scale: positive attitudes will be less positive, and negative attitudes will be less negative.

In the present research, I propose that the relationship between the strength associated with pre-existing attitudes toward a context and that toward a target is the key in determining the magnitude of context effects. It can be reiterated that there exist at least eighty-one combinations of contextual and target objects – nine types of attitudes (A₁ through A₉) for a context by nine types of attitudes for a target. To illustrate the divergent context effects varying in magnitude and direction within one place, I introduce a new evaluative judgment plane. In the following studies, I show how these divergent context effects can distort the evaluative judgment plane (Studies 1 and 2) and what the underlying processes are of the differing magnitudes/directions of the context effects (Studies 3, 4a, 4b, and 5). Across the six studies, I utilize various operationalizations in my key construct: attitude strength is manipulated (Studies 2, 3, 5) by manipulating its causal antecedent (elaboration) and is measured using a metacognitive aspect for attitude certainty (Studies 2, 3, and 5) and an operational indicator for attitude accessibility (Study 1).

Chapter 4. Study 1

In Study 1, I attempt to provide initial evidence for all hypotheses discussed in the previous section. We selected eleven different U.S. cities as our stimuli. Among the eleven, four were selected as contextual stimuli: an extremely positive and strong attitude object (EPASA, hereafter), an extremely negative and strong attitude object (ENASA), an extremely positive and weak attitude object (EPAWA), and an extremely negative and weak attitude object (ENAWA). Using the eleven cities, I prepared forty different binary combinations: one of the four contextual cities and the other ten remaining cities in the pool as target cities. Participants were given only one of the forty binary combinations. The four contextual cities were used both as the context in one experimental condition and as the target in the other condition, resulting in a 4 (contextual city: EPASA vs. ENASA vs. EPAWA vs. ENAWA) X 10 (target city) X 2 (order in the pair: contextual city first vs. target city first) between-subjects design.

4.1. Pretest: Stimuli Selection

To select multiple different U.S. cities that vary by their attitude and attitude strengths, thirty different U.S. cities were pretested with five hundred and six undergraduate students (male = 57.71%, average age = 20.92). Participants were given only one of the thirty cities as their stimulus. As a measure for attitude strength in this pretest, as well as in Study 1, an operational indicator of attitude accessibility was used: response latency to an attitude question (see Fazio 1995; Fazio, Powell, and Williams 1989, for a review).

Each participant was first given the name of a city at the top of the computer screen, coupled with the words “like–dislike” on the bottom, which resulted in a dichotomous scale. MediaLab software recorded the response latency from the presentation of the city’s name to the

participant's response (clicking either the "Like" or "Dislike" buttons). The response latency here was used for the measure of attitude strength. Importantly, before proceeding to the screen with the Like–Dislike buttons, participants were clearly instructed to respond as quickly and as accurately as possible (Fazio 1990; Fazio, Powell, and Williams 1989; Kwon and Nayakankuppam, 2015).

In the next computer screen, participants reported again their attitude toward the same city on a traditional bipolar nine-point attitude scale, ranging from very negative (–4) to very positive (+4), in order to assess their attitudes. For this question, they were instructed to respond as accurately as possible, rather than as quickly and as accurately as possible. Next, participants were asked whether they had ever heard of the name of the city before participating in the experiment. If they had not, their responses were deleted before the analyses. Lastly, the participants' demographic information was collected.

The purpose of the pretest was to select a sufficient number of stimuli out of thirty that could respectively represent each area of interest on the evaluative judgment plane: ranging from extremely negative to extremely positive on the horizontal axis, and from very strong to very weak on the vertical axis. A total of eleven stimuli were selected for Study 1 (see Table 1), based on two criteria: 1) smaller variations on attitude responses and attitude accessibility measures among participants; and 2) non-significant gender differences on the two scales. Among the eleven, New York City, NY was selected as an EPASA (extremely positive and strong attitude) city; Detroit, MI was selected as an ENASA (extremely negative and strong attitude) city; Ft. Lauderdale, FL was selected as an EPAWA (extremely positive and weak attitude) city; and Newark, NJ was selected as an ENAWA (extremely negative and weak attitude) city (see Figure 3).

4.2. Sample and Procedure

One thousand four hundred and sixty–seven undergraduate students at the same university (i.e., the same population for the pretest) were randomly assigned to a 4 (contextual city: EPASA vs. ENASA vs. EPAWA vs. ENAWA) X 10 (target city) X 2 (order in the pair: contextual city first vs. target city first) between-subjects design (male = 62.41%, average age = 21.00 years).

The procedure was kept similar to that of the pretest, except that the participants in Study 1 estimated a *pair* of stimuli, rather than a single stimulus in question. Half of the participants were given and reported their attitude toward one of the four contextual cities first and then reported their attitude toward one of the remaining ten cities; the other half of the participants were given and reported their attitude toward the contextual city *after* they reported their attitude toward one of the ten cities. Except for the fact that the participants were given a pair of cities rather than one city, the same procedures, instructions, and the order in which the attitude and attitude accessibility were measured remained in place.

Note that the participants were told that the purpose of the study was to gather information on consumer preference for several brands/celebrities/places/etc. As such, they were given a total of four pairs of stimuli to evaluate: three pairs of them that were not related to this study (e.g., a pair of shoe brands and a pair of pop singers) and a pair of U.S. cities. Among the four pairs of stimuli, the pair of cities was placed last in order to give participants enough chances to practice clicking on either the “Like” or “Dislike” buttons as quickly and as accurately as possible (following Fazio 1995). Finally, the participants were debriefed, thanked, and dismissed.

4.3. Results

Before data analyses, responses from 33 participants were deleted from the study because they failed to follow instructions (e.g., a participant took more than 1 minute in indicating whether she liked or disliked *Nike* on the dichotomous scale, while she spent less than 1 second in indicating her attitude toward the same brand, *Nike*, on 9–point attitude scale, the sign that she did not follow the instructions to respond as quickly as possible for the question with the dichotomous scale and to respond as accurately as possible for the question with the 9–point attitude scale). Note that participant loss occurred randomly across all conditions (8, 11, 7, and 7 participants respectively from the four contextual city conditions; decomposed differently, 18 and 15 participants respectively from the two order conditions). Thus, among a total of 1,467 responses, 1,434 responses were analyzed.

A 4 (contextual city: EPASA vs. ENASA vs. EPAWA vs. ENAWA) X 10 (target city) ANOVA on attitude toward the target city yielded a significant two-way interaction ($F(26, 1354) = 2.09, p = .001$), in addition to the main effects of the contextual city ($F(3, 1354) = 2.63, p = .049$) and of the target city ($F(10, 1354) = 81.92, p < .001$). The significant two-way interaction on attitude toward the target city suggests that participants' evaluations of the same target city differed, depending on which contextual city was paired with the target city. To better illustrate these data patterns, the four conditions for the contextual city were decomposed for further analyses.

4.3.1. EPASA (Extremely Positive And Strong Attitude) as a Contextual City

4.3.1.1. The Effect of Context on an EPASA

I performed a 2 (position of the EPASA in a pair: as a contextual vs. as a target city) X 10 (another city in the pair) ANOVA on attitude toward the EPASA (New York City). The results revealed that the main effect of the EPASA position on attitude did not approach significance ($M_{\text{as-a-context}} = 2.09$, $M_{\text{as-a-target}} = 2.10$; $F(1, 481) = .01$, *NS*), which suggests that the evaluative judgment on an EPASA (as a target) is not influenced by the context of another city. As expected, neither the main effect of another city in the pair ($F(9, 473) = .16$, *NS*), nor the interaction effect ($F(9, 463) = .54$, *NS*) emerged.

A 2 X 10 ANOVA on strength (adjusted accessibility) associated with attitude toward an EPASA was conducted. Adjusted accessibility refers to centered, log-transformed accessibility: it is equal to the \log_{10} accessibility of the attitude, subtracted by the grand mean of the \log_{10} accessibilities of attitudes toward all stimuli. Thus, a negative value represents greater attitude strength than the average – thus, it is faster to access the participants' attitudes in their memory than the average time taken. That is, adjusted accessibility represents the *relative* attitude strength.

The results show that the main effects of the EPASA position on adjusted accessibility did not emerge, either ($M_{\text{as-a-context}} = -.133$, $M_{\text{as-a-target}} = -.137$; $F(1, 481) = .11$, *NS*). Taken together with the non-significant main effect of the EPASA position on attitude, the results support my first hypothesis (H_1) that the evaluative judgment on an EPASA is less likely to be influenced by the context. As predicted, neither the main effects of another city in the pair ($F(9, 473) = .39$, *NS*) nor the interaction effect ($F(9, 463) = .63$, *NS*) on adjusted accessibility emerged.

In sum, the data show that neither attitude toward an EPASA nor the strength associated with it are affected by the context effects of any other cities.

4.3.1.2. The Context Effect of an EPASA

Before proceeding to the data analyses, I plotted each city on the evaluative judgment plane, based on the attitude and the strength (i.e., adjusted accessibility) reported in each experimental condition (see Figure 4). Note that for the EPASA (i.e., New York City), since no context effects on the EPASA were observed, attitudes toward the EPASA and the strength associated with them for the first ten conditions (with EPASA being the target) were averaged, and those for the other ten conditions (with EPASA being the context) were averaged and plotted.

Note that the positions of all cities on the plane under the EPASA-as-a-target conditions are similar to the pretest results (compared with Figure 3). More importantly, however, it is noticeable that the picture for the EPASA-as-a-context condition is quite different from that of the EPASA-as-a-target condition, as well as from that of the pretest. The changes in the positions of the same city are more evident in such cities located in the mid-range of the vertical axis (Kansas City, Chicago, Wichita, and New Orleans), which suggest that the stimuli with neutral-strength attitudes are influenced by the context of the EPASA more than those with either very strong or very weak attitudes. To examine if this was the case, I conducted a *t*-test for each city, comparing the attitudes between the two conditions when a target city was evaluated first, and when the same city was evaluated after NYC. The results reveal that significant differences in attitude extremity are found only in the cities that are plotted in the neutral-strength range on the vertical axis of the evaluative judgment plane: Chicago ($t(41) = -1.74, p = .089$), New Orleans ($t(45) = -2.02, p = .050$), and Wichita ($t(58) = 2.79, p = .007$; see Table 2).

Note that the t-test considered only the differences in the horizontal axis (i.e., attitude extremity) of the plane. Of importance, however, is that the context effect can occur on the vertical axis, as well (i.e., changes in attitude strength). Thus, for a more holistic view of the context effect of an EPASA, I calculated and analyzed the Euclidean distance for each city on the plane, from the position of a city in the EPASA-as-a-target condition to the position of the same city in the EPASA-as-a-context condition. Since the scales for attitude extremity and for attitude strength are varied, each variable was first z-transformed before the calculation of the distance.

We tested our second hypothesis using the Euclidean distance of each stimulus. If it is the case that the magnitude of the context effects by an EPASA is greater for cities with neutral-strength attitudes than for those cities with either strong or weak attitudes (i.e., H_2), this effect should emerge in the form of a significant correlation between the Euclidean distance and the *squared* term of the accessibility (i.e., strength measure) measured in the EPASA-as-a-target condition, where the stimuli are free of context effects. To test this idea, two sets of regression analyses were conducted: one at the aggregate-level (the distance between the *mean* of a city under the EPASA-as-a-context condition and the *mean* of the same city under the EPASA-as-a-target condition) and another at the individual level. For individual-level analyses, all possible combinations of observations were considered. For example, the Detroit-to-NYC condition had 24 observations, whereas the NYC-to-Detroit condition had 19 observations. To match up these differing numbers of observations between conditions, a total of 456 Euclidean distances (i.e., 24 X 19) were calculated for the stimulus of Detroit.

First, a regression analysis at the aggregate-level included the Euclidean distance for each city as a dependent measure, and a *squared* term of accessibility for each city under the EPASA-

as-a-target condition as the independent measure. I found a significant negative relationship ($\beta = -0.63$, $t(10) = -2.40$, $p = .040$) between the Euclidean distance and the squared term of accessibility, suggesting that the magnitude of the context effect (captured by the Euclidean distance) and the strength associated with the attitudes toward a target city have an inverted U-shaped relationship. In particular, the analysis that regressed the Euclidean distance on accessibility did not yield a significant *linear* relationship ($\beta = .07$, $t(10) = .21$, *NS*).

Second, for the individual-level data, a regression yielded a significant negative relationship between the Euclidean distance and the squared term of accessibility ($\beta = -1.11$, $t(6335) = -17.24$, $p < .001$). In addition, another regression analysis with the non-squared, original term of the same variable as an independent variable yielded a significant negative relationship, as well ($\beta = -.032$, $t(6335) = -2.47$, $p = .014$), presumably because of the increased power of the sample size. However, when the squared term was controlled, the original term did not yield a significant relationship ($\beta = -.004$, $t(6335) = -.36$, *NS*).

To examine the direction (i.e., assimilation vs. contrast) of the context effect, I selected and focused on the cities that were positioned in the neutral-strength range *and* that showed either positive or negative attitudes rather than neutral attitudes. With the two selection criteria, four stimuli were analyzed: Chicago, New Orleans, Kansas City, and Wichita. I conducted a 2 (position in a pair: before vs. after the EPASA) X 2 (valence: positive-attitude cities vs. negative-attitude cities) ANOVA on attitude. To make it clear, Chicago and New Orleans represented *positive-*, and Kansas City and Wichita represented *negative-*attitude cities (see Figure 4). The ANOVA yielded a two-way interaction ($F(1,195) = 13.65$, $p < .001$), in addition to the main effect of valence ($F(1,195) = 74.76$, $p < .001$). Preplanned comparisons revealed that when the cities with positive and neutral-strength attitudes were evaluated after an EPASA, the

evaluations of these cities were less positive than when they were evaluated before an EPASA; that is, they were shifted *against* the EPASA position on the plane—*contrast effect* ($M_{\text{positive \& before-EPASA}} = 1.42$, $M_{\text{positive \& after-EPASA}} = .68$, $F(1,89) = 6.24$, $p = .014$). In contrast, when the cities with negative and neutral-strength attitudes were evaluated after an EPASA, the evaluations of these stimuli were less negative than when they were evaluated before an EPASA; that is, they were shifted *toward* the EPASA position on the plane—*assimilation effect* ($M_{\text{negative \& before-EPASA}} = -1.13$, $M_{\text{negative \& after-EPASA}} = -.34$, $F(1,105) = 6.51$, $p = .012$; see Figure 5).

4.3.2. ENASA (Extremely Negative And Strong Attitude) as a Contextual City

4.3.2.1. The Effect of Context on an ENASA

A 2 (position of an ENASA in a pair: as a contextual vs. as a target city) X 10 (another city in the pair) ANOVA on attitude toward the ENASA (Detroit) did not yield an interaction effect ($F(9, 316) = .993$, *NS*). Neither main effects of the ENASA position ($F(1, 316) = 1.51$, *NS*) nor of another city in the pair ($F(9, 316) = 1.17$, *NS*) emerged. A 2 X 10 ANOVA on strength (adjusted accessibility) associated with attitude toward an ENASA did not yield either an interaction ($F(9, 316) = .71$, *NS*) or main effects of ENASA position ($F(1, 316) = 1.83$, *NS*) or of another city in the pair ($F(9, 316) = 1.53$, *NS*). The results suggest that the evaluative judgment on an ENASA (as a target) is not influenced by the context of another city.

4.3.2.2. The Context Effect of an ENASA

The evaluative judgment plane for ENASA showed a similar picture with that for the EPASA (see Figure 6). The difference in position between ENASA-as-a-target and ENASA-as-a-context

conditions were more evident in such cities located in the mid-range of the vertical axis (i.e., those with neutral-strength attitudes) than those with either very strong or very weak attitudes.

I conducted a t-test on attitude toward each city, comparing the attitudes between ENASA-as-a-target and ENASA-as-a-context conditions. Significant differences in attitude were found only in Chicago ($t(31) = 5.65, p = .024$), Kansas City ($t(28) = 3.88, p = .059$), and Wichita ($t(32) = 4.32, p = .046$) – all three were located in the mid-range of the vertical axis. Taken all together, the data pattern for ENASA conditions were the same as that for the EPASA.

4.3.3. EPAWA (Extremely Positive And Weak Attitude) and ENAWA as Contextual Cities

To test my third hypothesis that the object toward which a weak attitude will not yield context effects, the context effects of EPAWA and of ENAWA on other ten cities were analyzed. First, I conducted a t-test on attitude toward each city, comparing the attitudes between EPAWA-as-a-target and EPAWA-as-a-context conditions. No significant differences in attitude were found for any of the ten cities (all $P_s > .10$). Second, t-tests for the ENAWA found no significant differences in any of the ten cities (all $P_s > .10$). Taken together, the results show that weak attitude objects did not yield context effects.

The evaluative judgment planes for EPAWA and for ENAWA showed similar patterns of data (see Figure 7). Note that, however, these patterns were quite different from those for EPASA and ENASA.

4.4. Discussion

The results support all of my focal hypotheses. The data reveal that: 1) target objects with strong attitudes are “context-free”; 2) significant context effects were observed only when the

strength associated with the attitudes toward target objects were “moderately” smaller than those associated with the attitudes toward contextual objects, which was shown by the cities with strong attitudes (i.e., EPASA and ENASA) generating significant context effects only onto cities with neutral–strength attitudes (e.g., Chicago and Wichita), but not on the cities with weak attitudes (e.g., Ft. Lauderdale and Newark); 3) weak attitudes (i.e., EPAWA and ENAWA) did not yield any context effects; and 4) When the context effect emerged, the attitude extremity of a target decreased – positive attitudes became less positive and negative attitudes became less negative.

Recalling my earlier discussion on the evaluative judgment plane, let us imagine that an individual’s evaluative judgments on a number of items are collected within the same product category. If they are plotted on the evaluative judgment plane, and if the number of judgments is large enough to fill up a certain area on the plane by these points, a certain shape of the evaluative judgment plane for the product category will result. I propose that if there is an EPASA and/or an ENASA item in a product category, and if an individual evaluates any item(s) compared to an EPASA or an ENASA, the context effects caused by the EPASA or the ENASA will distort the original evaluative space without the EPASA or the ENASA. My data in Study 1 provide the preliminary evidence for this contention. To illustrate, let us consider the two conditions: EPASA-as-a-context and EPASA-as-a-target conditions. If we connect all points of the evaluative judgments concerning the eleven cities for each condition, it will generate two different evaluative judgment planes: one without the context effects, and the other with the context effects. In Figure 9, we see that the evaluative judgment plane for the after–EPASA condition (the patterned area) has shrunk from the square-shaped, original evaluative judgment plane. That is, the differing magnitudes/direction of the context effects caused by the EPASA

distorted the original evaluative space. Note that I found similar patterns of data in the ENASA conditions, but not in the EPAWA or ENAWA conditions. As such, I can conclude that the evaluative space distortion is caused by the context effect of extreme—and—strong attitude objects: the equally positive or negative but *weak* attitude objects (EPAWA and ENAWA) compared to the EPASA/ENASA do not distort the evaluative space.

A significant concern arises regarding the results of Study 1 that I address in Study 2. The stimuli used in Study 1, the eleven U.S. cities, were the objects toward which participants already had existing attitudes. As such, although I utilized *relative* strength concepts (i.e., centered by the mean) for the analyses of attitude strength, it is possible that the *actual* strengths associated with their attitudes toward the eleven cities are all strong, or all weak. If it is the case, I can hardly conclude that it was the strong attitude that distorted the evaluative space. In addition, we admit that the U.S. cities were noisy stimuli to test my hypothesis: it is possible that things other than attitude and attitude strength might have been played a role herein. For example, some cities in the pool were urban, cosmopolitan areas with a large population (e.g., NYC and Chicago), while other cities were relatively smaller cities. Some were cities on the East Coast, while others were located in the Mid-Western area, Southern area, and so on. For a more controlled procedure, in Study 2, I prepare fictitious brands, manipulate attitudes and attitude strengths toward them, and investigate the context effects and the distortion of evaluative judgment plane. The purpose of Study 2 is to replicate the results of Study 1 using manipulation procedures. In addition, to extend the spectrum of the effects, I utilize a different indicator for strength: namely, a metacognitive measure of attitude certainty.

Chapter 5. Study 2

A considerable amount of research has documented that strong attitudes are a product of effortful cognitive elaboration (Petty and Cacioppo 1984; Petty and Wegener 1999). In other words, individuals who attend to their cognitive efforts and elaborately process message arguments can form relatively strong attitudes based on their thoughts regarding the persuasive message. In contrast, those who expend a low level of elaboration on their evaluative judgment processes are more likely to rely on peripheral cues and/or heuristics, which result in non-thoughtful inference processes and, in turn, end up with relatively weak attitudes. In other words, people can form similarly positive or negative attitudes either through relatively thoughtful or relatively nonthoughtful processes, but the strength with which these two attitudes are held should differ (Petty and Cacioppo, 1986). In study 2, we leveraged this insight to manipulate attitude strength.

We prepared five different consumer reviews on two fictitious brand 3D-TVs, called K* and T², respectively. Among the five consumer reviews, two of them were for the K* 3D-TV (one positive and one negative), and the remaining three were for the T² 3D-TV (positive, neutral, and negative). A positive review rated the TV as a five-star product, described its good features, shared satisfactory personal experiences with the TV, and ended with a strong recommendation; a negative review rated it as a one-star product, described its negative features, shared unsatisfactory experiences, and ended with a recommendation to consider other TVs; and a neutral review rated the TV as a three-star product, and described both the good and bad features, and shared mixed feelings and experiences about the TV (see Appendix for a sample of a consumer review).

We manipulated the level of elaboration (high vs. low) while participants were reading either of the two (positive vs. negative) consumer reviews of the K* 3D-TV in order to generate four different types of attitudes toward the K*: strong–positive, strong–negative, weak–positive, and weak–negative. For the T² 3D-TV, we manipulated elaboration into three levels (high vs. medium vs. low) while participants were processing one of the three consumer reviews (positive vs. neutral vs. negative), which resulted in nine different types of attitudes: strong–positive, strong–neutral, strong–negative, neutral–strength–positive, neutral–strength–neutral, neutral–strength–negative, weak–positive, weak–neutral, and weak–negative. We investigated the context effects of the K* on the T² 3D-TV.

5.1. Consumer Review Pretest

The five consumer reviews were pretested with 63 participants (male = 68.33%, average age = 20.63 years). They read only one of the five reviews and indicated their attitudes toward the 3D-TV appearing in the reviews. The results confirmed that both positive reviews led to equally positive attitudes, both negative reviews yielded equally negative attitudes, and the neutral review led to neutral attitudes ($M_{\text{positive_K}^*} = 2.21$, $M_{\text{positive_T}^2} = 2.05$, $M_{\text{negative_K}^*} = -2.15$, $M_{\text{negative_T}^2} = -1.97$, and $M_{\text{neutral_T}^2} = -0.12$). Note also that the positive and negative reviews were equally distant from the midpoint of the scale.

5.2. Sample and Procedure

One thousand and one hundred thirty–three participants were recruited through the Amazon Mechanical Turk online panel in the U.S in exchange for nominal compensation (male = 53.75%, average age = 33.90). Participants were randomly assigned into a 2 (valence of the K*

review: positive vs. negative) X 2 (elaboration on the K* review: high vs. low) X 3 (valence of the T² review: positive vs. neutral vs. negative) X 3 (elaboration on the T² review: high vs. medium vs. low) X 2 (order of the TVs) between-subjects design. Participants were first given either of the consumer reviews of the K* 3D-TV (positive or negative) and were asked to read it. Before proceeding, participants in the high elaboration conditions were given instructions designed to facilitate elaboration: they were told that the experimenter was investigating how *thoughtful* the product review was and instructed participants that in order to assess product review thoughtfulness, they would need to read the review paying particular attention to the thoughts and feelings that would come to their mind as they looked at and read the review. After reading the consumer review, they were asked to indicate how easy it was to pay attention to their thoughts and feelings on a -4 (very difficult) to +4 (very easy) bipolar scale. Participants in the low elaboration conditions were given instructions designed to hinder elaboration: they were told that the experimenter was investigating how *comprehensible* the product review was and instructed participants that in order to assess product review comprehension, they were asked to read the review *and* count the number of articles (a, an, the) appearing in each paragraph, add the number of articles in the odd-numbered paragraphs (paragraphs 1 and 3) and subtract them by the number of articles in the even-numbered paragraphs (paragraph 2 and 4). They were asked to do these calculations in their mind without writing down anything. After reading the consumer review, they were asked to report the result of the calculation they made.

After the filler question, participants were then given one of the three (positive vs. neutral vs. negative) consumer reviews of the T² 3D-TV. Participants in the high or low elaboration conditions were given either of the same instructions described above. Those in the medium elaboration conditions were told that I was investigating how *descriptive* the consumer review

was and were instructed that in order to assess product review descriptivity, they needed to read the review *and* add up all of the numbers appearing in the review. They were asked to do these calculations in their mind without writing down anything. Note that this calculation task would be much easier than that in the low elaboration condition. On average, there were 24 numbers appearing in a consumer review (see Appendix for a sample of a consumer review).

Next, participants completed a series of filler studies designed to clear out the contents of their working memory, and then proceeded to the focal task. They were first asked to indicate their attitudes toward one TV on the -4 to $+4$ attitude scale and how certain they were about this attitude on a -4 (very uncertain) to $+4$ (very certain) bipolar scale. After that, they were asked the same questions for another TV. The order of the evaluative judgments on the TVs was manipulated: half of the participants first completed the questions on the K^* followed by those on the T^2 3D-TV; the other half first completed those on the T^2 followed by those on the K^* 3D-TV.

5.3. Results

The purpose of Study 2 was to replicate the results of Study 1 using two fictitious products. Between the two, the K^* 3D-TV was utilized as a contextual product, toward which attitudes were manipulated to diverge into four different types (strong–positive, strong–negative, weak–positive, and weak–negative), which represents EPASA, ENASA, EPAWA, and ENAWA, in Study 1, respectively. Therefore, the T^2 3D-TV was utilized as a target product.

5.3.1. Manipulation checks

To test whether my manipulations successfully yielded the four types of attitudes toward a contextual product (K^* 3D-TV), the conditions in which the contextual product was first

evaluated were selected for analyses. I performed a 2 (valence of the K* review: positive vs. negative) X 2 (elaboration on the K* review: high vs. low) ANOVA on attitude toward the K* TV. For attitudes, only the main effect of valence emerged ($M_{\text{positive}} = 1.94$, $M_{\text{negative}} = -2.07$, $F(1, 554) = 748.82$, $p < .001$), but neither the main effect of elaboration ($M_{\text{high}} = -.17$, $M_{\text{negative}} = -.22$, $F(1, 554) = .19$, NS) nor the interaction ($F(1, 554) = .596$, NS) was observed. Strength (i.e., attitude certainty), however, was different between the high and low elaboration conditions ($M_{\text{high}} = 1.80$, $M_{\text{negative}} = -1.48$, $F(1, 554) = 364.71$, $p < .001$). As such, the manipulations worked as intended: equally positive (or negative) attitudes resulted for both high and low elaboration conditions, but these attitudes differed in the strengths associated with them, which resulted in the four different types of attitudes: strong-positive, strong-negative, weak-positive, and weak-negative.

For the target product (T² 3D-TV), the conditions in which the target product were evaluated first were selected for the manipulation check, which would represent the *original* attitudes that were not yet influenced by the context effects of the K* TV. A 3 (valence of the T² review: positive vs. neutral vs. negative) X 3 (elaboration on the T² review: high vs. medium vs. low) ANOVA on attitude yielded only the main effect of valence ($M_{\text{positive}} = 2.02$, $M_{\text{neutral}} = .13$, $M_{\text{negative}} = -2.02$, $F(1, 566) = 316.82$, $p < .001$), but not a main effect of elaboration ($M_{\text{high}} = -.02$, $M_{\text{medium}} = .00$, $M_{\text{low}} = .13$, $F(1, 566) = .084$, NS). A 3 X 3 ANOVA on strength (attitude certainty), however, yielded the main effect of elaboration ($M_{\text{high}} = 1.91$, $M_{\text{medium}} = .08$, $M_{\text{low}} = -1.45$, $F(1, 566) = 240.48$, $p < .001$). Taken together, the manipulations on the target product worked as intended: nine different types of attitudes were created: strong-positive, strong-neutral, strong-negative, neutral-strength-positive, neutral-strength-neutral, neutral-strength-negative, weak-positive, weak-neutral, and weak-negative.

5.3.2. Preview of the Data Patterns: Distortion of the Evaluative Spaces

I decomposed the data into the four sets, divided by the types of attitudes toward the contextual product (K^* TV), and plotted participants' evaluative judgments regarding the target product (T^2 TV) on the evaluative judgment plane. Figure 10 illustrates the context effects of the contextual product toward which the attitude is strong—positive.

Note that the divergent patterns of the context effects look similar to those found in the EPASA conditions in Study 1: the context effects seemed more evident for those with neutral–strength attitudes (T_4 , T_5 , and T_6 , in Figure 10), and the extremities of those attitudes seemed to decrease (T_4 became less positive, and T_6 became less negative). As in Study 1, I connected all of the *original* positions of the targets together and all of the *changed* positions together, which resulted in two different planes. Figure 11 illustrates these planes for each of the four types of contextual products. Note that the patterns looked similar to those in Study 1: the contexts with strong attitudes distorted the original evaluative judgment planes, but those with weak attitudes did not distort the planes.

5.3.3. The Context Effects – Attitude

Before proceeding to the analyses, the valence of the contextual product conditions collapsed, since it did not interact with any of my key variables. I conducted two different sets of analyses: one for the context effects of the contextual product with strong attitudes, and the other for those of the contextual products with weak attitudes.

5.3.3.1. The Context Effects of the Contextual Product with a Strong Attitude

A 2 (order of stimuli) X 3 (valence of the T² review: positive vs. neutral vs. negative) X 3 (elaboration on the T² review: high vs. medium vs. low) ANOVA on attitude toward the target product, the T² 3D-TV, yielded a significant three-way interaction ($F(4, 685) = 2.57, p = .037$). Planned analyses confirmed that the three-way interaction was driven by the differences in the attitudes under the medium elaboration conditions (i.e., neutral-strength attitudes), which was evident by the fact that the two-way interaction between the order and valence emerged in the medium elaboration conditions ($F(2, 223) = 6.60, p = .002$), but did not emerge either in the high ($F(2, 277) = .37, NS$) or low elaboration conditions ($F(2, 185) = .06, NS$).

In addition, a 2 (order of stimuli) X 3 (elaboration on the T² review: high vs. medium vs. low) ANOVA on attitude certainty (i.e., strength) for the T² 3D-TV yielded a marginally significant two-way interaction ($F(2, 685) = 2.53, p = .081$). Planned comparisons revealed that attitude certainty was different between when the T² 3D-TV was evaluated first and when the T² was evaluated later (i.e., after K^{*}) only under the medium elaboration conditions ($M_{T^2 \text{ first}} = .31, M_{T^2 \text{ later}} = -.16, F(1, 227) = 4.87, p = .028$), but not under high ($M_{T^2 \text{ first}} = 1.92, M_{T^2 \text{ later}} = 1.85, F(1, 281) = .14, NS$) or low elaboration conditions ($M_{T^2 \text{ first}} = -1.42, M_{T^2 \text{ later}} = -1.28, F(1, 189) = .43, NS$). That is, context effects occurred not only as the form of changed attitudes, but also as the form of decreased attitude certainty.

5.3.3.2. The Context Effects of the Product toward which Attitude is *Weak*

A 2 (order) X 3 (valence of the T² review) X 3 (elaboration on the T² review) ANOVA on attitude toward target product, the T² 3D-TV, did not yield any interaction effects. Of importance, the attitudes toward targets did not interact with the order of the stimuli. Only the

main effect of valence emerged ($F(2, 412) = 252.57, p < .001$): neither the main effects of order ($F(1, 412) = .750, NS$) nor of elaboration (i.e., strength) ($F(2, 412) = .164, NS$) emerged. No effects were found in the analyses of attitude certainty, either.

5.4. Discussion

In Study 2, I manipulated participants' attitudes toward two fictitious products and replicated the results found in Study 1: 1) the differing magnitudes of the context effects as a factor of the strength with which attitudes toward the target objects are held; and 2) the distortion of the original evaluative judgment plane caused by the divergent magnitudes/directions of the context effects of strong attitude objects is maintained. Of importance, I utilized another kind of strength measure, a metacognitive measure of attitude certainty, and showed that the same effects were found in that measure, as well. I believe that this extends the spectrum of my findings – divergent context effects and the evaluative judgment plane distortion when the attitude toward a contextual object is held strongly. More specifically, I show that when contextual objects are associated with strong attitudes, only target objects with neutral–strength attitudes are significantly influenced by context effects, but targets with either very weak attitudes are almost not influenced by context effects. This phenomenon is at odds with what the attitude strength literature would suggest: the stronger attitudes are, the more stable they are over time, which suggests that neutral–strength attitudes should be less vulnerable to the context effect than weak attitudes.

Then, why are the targets associated with weak attitudes relatively “immune” to the context effects of the contextual objects associated with strong attitudes? I suggest that it could be because the *type* of information retrieved from the memory differs between when one encounters

an object with a strong attitude and when one encounters an object with a weak attitude: stored *attitude* is likely to be directly retrieved in the memory when encountering an object with a strong attitude, whereas *attribute information* is likely to be retrieved when encountering an object with a weak attitude. Thus, when objects with strong attitudes serve as the contexts, they are not likely to provide any attribute-level information about themselves that would have been directly compared to the attribute-level information regarding targets with weak attitudes (i.e., the type of information likely to be retrieved for weak attitude objects). As such, the context with a strong attitude is not likely to influence the evaluative judgment of the target with a weak attitude, since there would be little information to compare the target with the context at the attribute level.

In the following two studies, I test this idea and delve into the underlying processes in order to provide evidence for my proposed process mechanism of divergent context effects of the strong attitude object.

Chapter 6. Study 3

In Study 3, I examine whether it is really the case that stored attitude is retrieved for an object with a strong attitude, whereas attribute information is likely to be retrieved for an object with a weak attitude. That is, I test whether the type of information (attitude vs. attribute) accessed in the memory is different between an object with a strong attitude and that with a weak attitude.

6.1. Sample and Procedure

Eighty-seven participants (male = 59.52%, average age = 21.64 years) were randomly assigned into a 2 (elaboration: high vs. low) X 2 (judgment type: evaluative judgment vs. attribute recognition) between-subjects design. Participants were first given a print ad for a fictitious charity, called World Aid, and were asked to form their attitudes toward the brand. Before proceeding to the print ad, participants were given different instructions, depending on their elaboration conditions. I manipulated their level of elaboration using the same procedure as that in Study 2. The print ad for World Aid included three statements (all positive) about the fictitious brand (e.g., “World Aid first to release funds to research into AIDS”). After the print ad, they reported their attitudes toward World Aid and attitude certainty, and proceeded to a series of filler tasks designed to allow a 20-minute temporal delay before proceeding to the focal task.

After the filler tasks, participants were given either of the two types of questions, depending on their judgment type conditions: those in the evaluative judgment conditions were given the World Aid brand logo at the top of the screen, accompanied by two buttons of “Like” and “Dislike,” and those in the attribute recognition conditions were given a statement (“World Aid

first to release funds to research into AIDS”) accompanied by “True” and “False.” Before participants proceeded, they were instructed to respond as quickly *and* as accurately as possible. Behind the scene, the response latency data were collected, and these response latency data served as my key dependent measure: how fast participants could respond to the attribute recognition question and the evaluative judgment question: that is, which type of information would be faster to access in the memory. They were given a total of five brands to respond to: four well-known brands that were not related to the study (e.g., “Coca-Cola” for the evaluative judgment conditions and “Coca-Cola has caffeine in it” for the attribute recognition conditions) preceded World Aid so that participants would “practice” quickly responding within the given interface.

6.2. Results

Three participants were deleted from the study before data analyses because they failed to follow instructions. Thus, among a total of 87 responses, 84 responses were analyzed.

6.2.1. Manipulation check

A one-way (elaboration: high vs. low) ANOVA on attitude did not yield a significant main effect of elaboration ($M_{\text{high}} = 1.86$, $M_{\text{low}} = 1.62$, $F(1, 82) = 1.04$, *NS*), whereas an ANOVA on attitude certainty did ($M_{\text{high}} = 1.18$, $M_{\text{low}} = -.70$, $F(1, 82) = 33.62$, $p < .001$). That is, the attitudes formed under different elaboration conditions did not differ in their extremities, but did differ in their certainty (i.e., attitude strength).

6.2.2. Response Latency

A 2 (elaboration: high vs. low) X 2 (judgment type: evaluative judgment vs. attribute recognition) ANOVA on response latency revealed a significant two-way interaction between elaboration and judgment type ($F(1, 80) = 21.80, p < .001$), in addition to the main effect of judgment type ($F(1, 80) = 4.39, p = .039$). Note that these effects emerged as well when the log-transformed response latency was analyzed (interaction: $F(1, 80) = 20.15, p < .001$; main effect of judgment type: $F(1, 80) = 5.62, p = .020$).

Planned comparisons revealed that participants under high elaboration conditions were faster to respond to evaluative judgments than to attribute recognition ($M_{\text{evaluative}} = 1,969, M_{\text{attribute}} = 3,099$ milliseconds, $F(1, 80) = 21.80, p < .001$), whereas those under low elaboration conditions were faster to respond to the attribute recognition versus evaluative judgment questions ($M_{\text{evaluative}} = 2,802, M_{\text{attribute}} = 2,372, F(1, 80) = 21.80, p < .001$). This pattern of data suggests that when encountering an object associated with a strong attitude, stored attitude is more likely to be retrieved in the memory rather than attribute information. In contrast, when encountering an object associated with a weak attitude, attribute information is more likely to be retrieved rather than a stored attitude.

6.3. Discussion

The data supported my contention that the *type* of information retrieved from the memory is likely to be different between an object with a strong attitude and that with a weak attitude. This finding *alone*, however, cannot explain the reason why the evaluation of targets associated with weak attitudes is not likely to be influenced by contextual objects associated with strong attitudes. To complete my proposed process mechanism, one more piece of the puzzle is needed,

which can show that it would be difficult to readily “compare” two objects when different types of information are accessed for different objects. I test this idea in Study 4.

Chapter 7. Study 4a and 4b

In Study 4, I examine whether individuals feel it is difficult to compare two objects when one object is an automatically retrieving attitude and the other is retrieving attribute information. I prepared two fictitious brand products. Participants were asked to recall either type of information (attitude vs. attribute) for each product and were given a choice task between the products. I investigated the relative ease/difficulty of the choice tasks in each experimental condition. Studies 4a and 4b were different only in the dependent measures of the choice task.

7.1. Sample and Procedure

Seventy-six participants (male = 58.67%, average age = 21.23 years) were invited to join Study 4a, and eighty-one participants (male = 52.44%, average age = 21.02 years) were invited to join Study 4b. In both studies, participants were randomly assigned to a 2 (judgment type for the first product: evaluative judgment vs. attribute recognition) X 2 (judgment type for the second product: evaluative judgment vs. attribute recognition) between-subjects design. As a cover story, participants were told that a well-known camera manufacturer had recently developed two new digital cameras (called, *Modernei* and *Blanc*, respectively), neither of which had been launched in the market. They were given six pieces of information about each fictitious camera: price, image quality (e.g., 18 mega pixels), professional review ratings, video resolution (e.g., full HD), zoom range, and LCD screen size. They were then asked to report their attitudes and attitude certainties toward each camera. The order of the cameras was counter-balanced.

After completing a 30-minute filler task, each participant was asked to recall only one type of information (either attitude or attribute) for each camera, such that only either type of information for each camera became salient in their memory. Under the evaluative judgment

conditions, participants were given the brand name (*Modernei* or *Blanc*) on each screen and were asked to respond to an evaluative judgment question. They were given the evaluative judgment questions a total of four times (dislike–like, unfavorable–favorable, negative–positive, bad–good), but once on each screen. Under the attribute recognition conditions, participants were given a statement about a camera (e.g., “The image quality of *Modernei* is 19 mega pixels”) and were asked to indicate whether the statement was true or false. They were given a total of four attribute recognition questions, one at a time. Depending on the assigned experimental conditions, some participants were given the same types of tasks for both cameras, while other participants were given different type of tasks for each camera.

Next, participants were given the choice task between the two digital cameras. In Study 4a, before proceeding to the choice task, participants heard, as a cover story, that the experimenters were interested in how efficiently consumers can make their choices. They were instructed that in order to assess choice efficiency, they would need to make their choice decision as quickly and as accurately as they could. Then, participants were given the choice task between the two fictitious cameras. Behind the scene, the time they took to make their choices between the two was recorded. Next, they were asked to indicate their perceived choice difficulties in the task – “How difficult was it for you to make a choice in the previous screen?” on a 1 (it was very easy) to 9 (it was very difficult) scale.

In Study 4b, participants were given three choice options: “I would choose *Modernei*,” “I would choose *Blanc*,” and “I want more information before making my choice.” I was interested in examining the probability of choosing the “I want more information” option as a factor of the question type combination. Thus, the responses were dummy-coded: choosing “I want more information” as 1, and choosing one of the cameras as 0.

7.2. Results

7.2.1. Study 4a

7.2.1.1. Manipulation checks

A one-way ANOVA revealed that participants had more positive attitudes toward the *Modernei* than toward the *Blanc* ($M_{Modernei} = 1.83$, $M_{Blanc} = 1.33$, $F(1, 79) = 4.28$, $p = .040$), but the strength associated with these attitudes were not different ($M_{Modernei} = 1.23$, $M_{Blanc} = 1.01$, $F(1, 79) = .64$, *NS*). These results suggest that the choice task between these two cameras was not a very difficult one.

7.2.1.2. Choice Task

A 2 (judgment type combination: same vs. different judgments for the two cameras) X 2 (first judgment type: evaluative judgment first vs. attribute recognition first) ANOVA on the time-taken to make a choice decision revealed the main effect of question combination ($M_{\text{same judgment}} = 5.18$, $M_{\text{different judgment}} = 6.43$ seconds, $F(1, 77) = 5.29$, $p = .024$; see Figure 12).

A 2 X 2 ANOVA on perceived choice difficulty revealed the same main effect ($M_{\text{same judgment}} = 5.98$, $M_{\text{different judgment}} = 4.34$, $F(1, 77) = 15.92$, $p < .001$).

7.2.2. Study 4b

Analyses were conducted that examined the effect of the judgment type combination (same vs. different) X first judgment type (evaluative judgment first vs. attribute recognition first) on the probability of choosing the “I want more information” option. The analysis revealed a main effect of task combination (choose more info options: same judgment types = 21.6%, different judgment types = 44.7%, $\beta = -1.089$, $\chi^2 = 4.421$, $p = .036$), but neither the main effect of the

first judgment type ($\beta = .022, \chi^2 = .001, p = .973$) nor the two-way interaction ($\beta = -.464, \chi^2 = .196, p = .658$) emerged. Figure 13 graphs the percentages of choosing the more-information option, rather than choosing either of the cameras for each condition.

7.3. Discussion

The results suggest that individuals feel more difficulty when comparing two products under a situation in which different types of information (attitude vs. attribute) are salient for each product than under a situation in which the same types of information are salient for both products. This effect was evident in the multiple measures: time-taken to make a choice decision, choice delay, and perceived difficulty of the choice task.

Taken together with the results found in Study 3, these findings support my contention that when objects with a strong attitude serve as the contexts, they are not likely to provide any attribute-level information about themselves, which can be directly compared to the attribute-level information about the targets with weak attitudes. This is why contextual objects with strong attitudes are not likely to influence the evaluative judgments of targets with weak attitudes. Given that weaker attitude objects are not likely to influence the evaluative judgments of stronger attitude objects (i.e., no context effects of weaker attitudes on stronger attitudes), the results of Studies 3 and 4 together support my contention that significant context effects can emerge only when the strength associated with attitudes toward target objects are “moderately” smaller than those associated with attitudes toward contextual objects.

Chapter 8. Study 5

The purpose of Study 5 is to test the proposed underlying process mechanism for the *direction* of context effects. As discussed, when individuals realize that they are less certain, and/or less confident, about their attitudes toward target objects, compared to those toward a contextual object, the perceived uncertainties in their attitudes toward the target may translate into diminishing the original extremity of their attitudes toward the target, regardless of the attitude valences, resulting in differing directions of context effects based on the valence of existing attitudes toward the targets: that is, target objects with positive attitudes become less positive, and those with negative attitudes become less negative.

I test this idea by manipulating the order between the attitude and attitude certainty question. Imagine that an individual realizes that s/he is not certain about his or her attitude toward a target object. In this case, if s/he is given an attitude question, s/he may want to reflect on the perceived uncertainty in the given attitude scale presumably by decreasing the extremity of his or her “original” attitude. However, if s/he is given a certainty question first, s/he can directly indicate the perceived uncertainty on the given certainty scale, so that when an attitude question follows, s/he does not need to reflect on the uncertainty of the attitude scale again.

8.1. Sample and Procedure

Four hundred and twenty-four participants (male = 56.24, average age = 27.93 years) were recruited from the Amazon Mechanical Turk online panel and were randomly assigned to a 2 (contextual product: strong positive vs. strong negative attitudes) X 3 (target product: neutral–strength positive vs. neutral–strength neutral vs. neutral–strength negative attitudes) X 2 (evaluation order: contextual product first vs. target product first) X 2 (question order: attitude Q

first vs. certainty Q first) between-subjects design. The experimental procedure was similar to that used in Study 2. For a contextual product, participants read a consumer review on the K* 3D-TV (either positive or negative reviews, depending on the assigned experimental conditions). All of the participants were given only the high–elaboration instruction for the K* 3D-TV, which resulted in either strong positive or strong negative attitudes toward the contextual product. For a target product, all of the participants were given the medium–elaboration instruction only and were given one of the three (positive, neutral, or negative) consumer reviews of the T² 3D-TV, which resulted in one of the neutral–strength positive, neutral–strength neutral, neutral–strength negative attitudes toward the target product (T² 3D-TV).

After a series of filler tasks, each participant was given an attitude scale and a certainty scale for the K* and the same scales for the T². The order of the products was manipulated. Of importance, the order between the scales was manipulated, as well.

8.2. Results

The valence (positive vs. negative) of the contextual product (the K* 3D-TV) did not interact with any of the key measures, and thus, were collapsed. Then, attitude toward the target object (the T² 3D-TV) was regressed on the valence of the consumer review on the target (positive vs. neutral vs. negative), evaluation order (contextual product first vs. target product first), and question order (attitude Qs first vs. certainty Qs first). As predicted, a significant three–way interaction emerged ($F(1, 422) = 14.14, p < .001$; see Figures 14 and 15). Note that, however, when attitude toward the contextual product was regressed, the three–way interaction did not emerge ($F(1, 422) = .041, NS$), suggesting that strong attitudes (toward the contextual product) were not influenced by context effects.

Next, changes in attitudes were analyzed toward the targets (on the *horizontal* axis of the evaluative judgment plane) after the context effect, as a function of the question order (attitude → certainty vs. certainty → attitude) and of the valence of the consumer review on the target. Changes in attitude were calculated at the individual-level data: each observed attitude response under the contextual-product-first conditions subtracted by the “average” attitude of the matching cell under the target-product-first conditions. The change in attitude was regressed on the order of question type (attitude first vs. certainty first) and the valence of the target products (positive vs. neutral vs. negative). As predicted, a significant interaction ($F(2, 203) = 8.72, p < .001$), along with the main effect of the valence ($F(2, 203) = 13.23, p < .001$), emerged. Of importance, the significant main effect of valence suggests that the more extreme attitudes the target objects have, the greater the changes in attitude (on the horizontal axis of the plane) there would be.

Changes in certainty were also calculated at the individual-level and were regressed on the order of question type and the valence of target products. As illustrated in Figures 14 and 15, only the main effect of order emerged ($F(1, 203) = 5.06, p = .026$): neither interaction ($F(2, 203) = .35, NS$) nor the main effect of valence ($F(2, 203) = .03, NS$) emerged.

I proposed the idea that the perceived uncertainty felt after the contextual product with a strong attitude would be reflected on whichever scale was given first (either attitude or certainty scales); thus, it would be less likely to be reflected on the other scale following the first scale. If this is the case, no effect of order should emerge when the change in Euclidean distance on the plane is regressed on the order of questions, because the concept of Euclidean distance incorporates changes on both the horizontal and vertical axes at the same time. The change in

Euclidean distance was calculated and regressed. As predicted, no main effect of order emerged ($F(1, 203) = 2.24, NS$).

8.3. Discussion

I designed Study 5 to reveal the underlying mechanism for the divergent direction of context effects on targets with positive attitudes and those with negative attitudes. I found that the underlying mechanism was simply the decreased extremity of attitudes created by perceived uncertainty in comparison to a contextual object with a strong attitude, which was evident in that:

1) The directions of context effects were independent of the valence of the attitudes toward the contextual object: that is, targets with positive (negative) attitudes became less positive (negative), regardless of the valence of the contextual product.

2) The changes of attitudes (i.e., the changes in the horizontal position on the evaluative judgment plane) were more prominent when participants were given the attitude scales first, whereas changes in certainty (i.e., the vertical axis) were more prominent when participants were given the certainty scale first (see Figures 14 and 15). In addition, no main effect of scale order was found in the changes in Euclidean distance.

Chapter 9. General Discussion

Academic research on consumer decision-making, preference, choice processes, and economic decisions has focused on either developing the best predictive model of people's behaviors (e.g., choices) or understanding the underlying consumers' decision-making processes. At the most basic level, consumer evaluative judgments are at the heart of all research areas listed above; that is, a consumer's attitude decides his/her subsequent behaviors and decisions. However, the dominant practice in evaluative judgment, attitude formation, and persuasion research has not considered the effects of other products on consumer evaluations with respect to the product/brand in question; rather, evaluative judgment and attitude researchers have typically focused on studying consumer evaluations regarding products/brands delivered in isolation (Tormala and Clarkson 2008). In reality, however, consumers rarely face situations in which they evaluate a single product/brand by itself. For example, in a store, multiple products and/or brands in the same product category are displayed on shelves. In online stores, multiple brands in the same product category are listed on the same page. As such, the product or brand in question is often evaluated within the context of other similar products and competing brands. Consumer evaluative judgment and attitude research to date, however, has largely overlooked these context effects created by other products in the same product category, which may bias the evaluative judgments of or the attitudes toward a target product/brand (Herr, Sherman, and Fazio 1983; Tormala and Clarkson 2007, 2008; Tormala and Petty 2005).

The purpose of the current research is to broaden an entirely new spectrum of people's *relative* evaluation processes and the results of their *relative* judgments; these are the kinds of consumer evaluative judgments that are more likely to occur in real-world situations. In particular, the current research focuses on the context effect created by the presence of an object

toward which attitudes are strong, before or during the evaluative judgment of a target object. I find that the presence of these strong attitude objects influences one's evaluative judgments on other objects of the same kind in a divergent manner (i.e., with differing magnitudes and directions). Specifically, I find that the context effect of a strong attitude object is greater for target objects with neutral–strength attitudes than for very strong or very weak attitudes—thus forming a U-shaped relationship between the strength of pre-existing attitudes toward targets and the magnitude of the context effect. I traced the underlying mechanism for this non-linear relationship and found that the similarity/difference in the types of information retrieved from the memory for a contextual and a target object plays a role herein. I found that context effects become greater when the types of retrieved information were the same between a contextual and a target object than when those were different. In addition, I find that the direction of the context effect of a strong attitude object varies: since the context effect of a strong attitude object occurs as a form of decreased attitude extremity toward a target, a positive attitude object becomes less positive, and a negative attitude object becomes less negative. Of importance, after all, these differing magnitudes and directions regarding the context effect of a strong attitude object finally result in the distortion of the original evaluative judgment plane of the given product category in question.

It can be reiterated that we can conceptualize at least eighty-one possible combinations of contextual and target objects concerning both the attitude and attitude strength of each object. Note that the current research did not investigate every single combination of the eighty-one cases. Rather, I focused on finding four rules of thumb that can be applicable, and thus, predictive of the context effects in each case, which are:

Rule #1: The target with a strong attitude will be less affected by context effects.

Rule #2: A contextual object will generate context effects only when the strength associated with the attitude toward it is “moderately” greater than the strengths associated with the attitudes toward the targets.

Rule #3: A contextual object will not generate context effects when the strength associated with the attitude toward it is weaker than the strengths associated with the attitudes toward the targets.

Rule #4: When a context effect emerges, the attitude extremity of a target will decrease.

Using the four rules of thumb above, we can predict the patterns of context effects in those combinations that were not tested in the current research. For example, we can predict that the context effect of an object with a neutral–strength positive (or negative) attitude are expected to occur only for weak attitudes, which would result in the shape of the “new” evaluative judgment plane looking somewhat like an inverted pentagon (from the original square shape, weak positive attitude objects would be less positive; a weak negative attitude object would be less negative; and all other target objects will remain as they were).

The current research contributes both to the context effect literature and to the attitude strength literature. As discussed earlier, a context effect can be *conceptually* divided by two different dimensions – the direction and the magnitude. However, to a large extent, the extant context effect literature has focused solely on the direction of context effects: in what situation

contrasts are more likely to occur, and in what situation assimilations are more likely (e.g., Dijksterhuis et al. 1998; Herr 1986; Herr, Sherman, and Fazio 1983; Markman and McMullen 2003; Martin and Seta 1983; Moskowitz and Skurnik 1999; Mussweiler 2003; Mussweiler, Ruter, and Epstude 2004; Pelham and Wachsmuth 1995; Schwarz and Bless 1992; Sherif and Hovland 1961; Stapel, Koomen, and van der Plight, 1997; Tormala and Clarkson 2007; Wedell, Parducci, and Geiselman 1987). Thus, we learned little, from the context effect literature, about the possible factors deciding the *magnitude* of the context effect. In addition, the knowledge about the magnitude of the context effect from the attitude strength literature has been limited as well. Attitude strength literature find that a strong attitude is more likely to be stable in a different context (e.g., Chaiken, Pomerantz, and Ginger-Sorolla 1995; Norman 1975), such that a target object with a stronger attitude should be less influenced by a context effect than a target with a weaker attitude is. In other words, attitude strength literature suggests that the strength associated with the attitudes toward *targets* may decide the magnitudes of context effects. However, unexplored in the attitude strength literature is the role of the strength associated with the attitudes toward a *contextual* object. In the current research, we considered together the strengths for both the contextual object and the target objects and found that the relationship between the two strengths is likely to decide the magnitudes of the context effects (the Rule #2: a contextual object will generate context effects only when the strength associated with the attitude toward it is “moderately” greater than the strengths associated with the attitudes toward the targets). To my best knowledge, this article is the first study exploring the role of the relationship between the two strengths on the magnitudes of the context effects.

In a similar vein, previous research in the attitude strength has focused on the consequences of strength to its attitude (e.g., stability and resistance to counter persuasion attempts). To my

best knowledge, the current research is the first to investigate the consequences of the strength associated with one attitude on other attitudes. In addition, in the extant context effect literature, context effect has always been unidimensional – looking at the attitude extremity of a target object affected by the attitude of a contextual object. The current research was the first to consider both attitudes and attitude strengths of both a contextual and a target object.

The results of Study 5 may cast a question to the context effect researchers – when participants were given an attitude certainty scale first, followed by an attitude scale, no significant changes in attitudes were observed, whereas when given an attitude scale first, followed by an attitude certainty scale, significant changes in attitude were found. It can be reiterated that results can be interpreted such that participants were just “expressing” their perceived uncertainties about their attitudes toward the target after the contextual object with a stronger attitude. In other words, the current research propose a possibility that at least some of the context effects reported in the previous research are not the products of assimilation/contrast thought processes: rather, the changes of attitudes after a context may often be the products of perceived uncertainty.

In the current research, I proposed the evaluative judgment plane – the attitude (extremity) and attitude strength coordinate, and conceptualized attitude strength to be orthogonal to attitude. In fact, however, the attitude strength literature shows that those two constructs are somewhat correlated in many cases (e.g., Krosnick et al., 1993), but there is a great deal of agreement among attitude researchers that attitude strength is a construct distinct from attitude extremity. For example, Priester et al. (2004) explain that attitudes that possess equivalent extremity (as measured by traditional bipolar scales) can differ as to the strength associated with the seemingly identical attitudes, such that one attitude is strongly held and the other attitude with equal

extremity is weakly held in memory (Kwon and Nayakankuppam 2015). As clarified earlier, I adopted this approach in this study: attitude strength is conceptually orthogonal to an attitude, and for this reason, we do not elect to treat attitude extremity as an indicator of attitude strength. I also believe that extremity suffers from being almost perfectly confounded with the concept of an attitude itself, and is, as such, much more messy. In contrast, operationalizing attitude strength as a multi-dimensional construct that can be assessed through antecedents (e.g., elaboration; Study 2, 3, and 5) and the consequential indicators such as metacognitive aspects of an attitude (e.g., certainty; Study 2, 3, and 5) or operational indicators (e.g., attitude accessibility; Study 1) is considerably cleaner. I believe that this also reflects the dominant (though certainly not unanimous) view in the field. In sum, although attitude extremity and attitude strength are somewhat correlated in many cases, they are conceptually orthogonal, such that we can conceptualize the attitude and strength coordinate – the evaluative judgment plane.

My findings, with respect to the distorted evaluative judgment plane by the context effects of a strong positive or negative attitude object (e.g., EPASA and/or ENASA) in a product category, suggest that many research methods being used to explore people's decision-making/choices/evaluative judgments, in both academics and practical applications, may often yield biased results. For example, the order of presenting different choice options in consumer choice research may distort participants' internal evaluation structures. In business, the results of consumer evaluation research being conducted to forecast the sales of new products or brands before their launch to the market may not reflect true consumer evaluations when they are actually introduced to the market. This is so because pretests given before launching the products or brands are often done in isolation, whereas actual consumer evaluations concerning the

products/brands after being launched are likely to be evaluated within the context of other products/brands in the same product category.

Utilizing the proposed attitude–attitude strength, evaluative judgment plane in this article will provide practitioners with valuable information on what the most urgent thing to do is for promoting their products/ brands, depending on consumer attitudes toward their products/brands. Imagine that a company has a limited budget for a commercial that may be able to increase consumers' perceptions toward its brand by only one unit in either direction of the plane (i.e., horizontal vs. vertical direction; more positive vs. more certain). If the brand is positioned in the first quadrant of the plane (i.e., somewhat positive and strong), but not as extreme or as strong as an EPASA (e.g., Chicago in Figure 4), it is a clear sign that the budget should be used to increase certainty over positivity, so that it gains more strength, and thus is less influenced by the EPASA. If the budget is used to make the brand more positive, but remains at the same level of certainty, the EPASA will push it away in any case, which may result in a waste of money spent on the commercial. If the brand is positioned in the first quadrant with the same strength as, but less positive than an EPASA, the budget should be used to increase the positivity of the brand, given that consumer attitudes toward the brand are already strong enough not to be significantly affected by an EPASA.

In addition, practitioners can consider the patterns of the context effects found in the current research in predicting the effect of a decoy product in order to set up their product display strategies or consumer choice set manipulations. For example, imagine that consumers have a weak–positive attitude toward your product and a neutral-strength positive attitude toward your competitors. Given that the attitude extremities were the same for your product and your competitors, consumers are of course more likely to choose one of your competitors than your

product, because they are more certain about their attitudes toward the competitors. In this case, what if a decoy product with strong–negative attitude is included in the consumer choice set? According to the findings in the current study, the attitudes toward your competitors are likely to be pulled down (i.e., becoming less positive) by the context effect of the strong–negative attitude, but your product is not or less, if any, likely to be affected by the context effect. Thus, the probability of you being chosen from consumers is likely to be increased compared to the situation without the decoy with a strong–negative attitude.

It is very important to note that consumer evaluative judgments are very vulnerable to contexts. Recall the quote by Sudman et al. (1996) that was introduced at the very beginning of this manuscript: “Human judgment is *always* context-dependent; in essence, context-free judgments do not exist.” Thus, it is not a matter of whether there is a context effect or not, but rather a matter of how strong the context effect is. The current article suggests that the magnitude of a context effect may depend on the strength associated with pre-existing attitudes toward a target object. In addition, the direction of the context effect may depend on the valence of the pre-existing attitudes toward a target object.

More importantly, the current research proposes that these differing magnitudes and directions of the context effect of a strong attitude object finally result in distortion of the evaluative judgment plane of a product category. For example, the context effect of the iPhone would distort the original evaluative judgment plane of the smart phone category by its differing magnitudes/directions of the context effect on different smart phones. I believe that this work contributes to the literature and to practitioners not only because it is theoretically and practically informative, but also because it has implications for measurement.

APPENDIX A: STIMULI

Study 2: A Sample of a Consumer Review

My rating of T² 3D-TV: ★★★★★ (out of 5 Stars)

If you are looking for a big screen television, with clear, in-depth 3-D effects, don't hesitate to buy this T² set. T² will make your home the center of football season, with or without the popcorn and beer!

This T² set is incredibly thin and the screen is simply huge. I watched Avatar and Shrek in 3D and found the 3D effects worked great. I found that depending on your settings in you may experience some cross-talk, but adjusted properly it was superb. In particular, I found the dynamic motion enhancement on the T² remote definitely makes 3D picture quality amazing. The 2D → 3D conversion button on the T² remote works impressively well and my Comcast ESPN 3d channel worked great too.

The T² app store and Internet connectivity is awesome on this TV. It has built in Netflix, Vudu, Blockbuster, Hulu, and more. Pretty much any streaming app you can think of. T² also has DLNA sharing support (you can simply connect your PC to the T² with no cords), and even plays the Blu-ray quality files I have on my PC at 1080p and 5.1 surround sound. Upgrading the firmware over the Internet is easy. The Vudu app even supports streaming true HD 1080p movies.

So, all-in-all, this T² set is a great 3D-HDTV with an especially great picture quality. I recommend this T² to anyone looking for a great 3DTV.

APPENDIX B: TABLES

Table B1. Study 1: Pretest Results

	Name of the City	Attitude	Accessibility ^a	Log ₁₀ Accessibility	Adjusted Accessibility ^b
1	New York, NY ^c	2.98	1300.83	3.099	-0.16
2	Chicago, IL	1.89	1502.63	3.159	-0.10
3	Newark, NJ ^c	-1.56	2557.68	3.372	0.11
4	Detroit, MI ^c	-2.19	1316.11	3.112	-0.15
5	Fort Lauderdale, FL ^c	2.60	2811.44	3.366	0.11
6	Kansas City, MO	-1.10	1650.24	3.192	-0.07
7	Louisville, KY	0.06	1855.31	3.249	-0.01
8	New Orleans, LA	1.55	2313.47	3.267	0.01
9	Philadelphia, PA	-0.02	1379.72	3.127	-0.13
10	Wichita, KS	-2.04	2025.94	3.278	0.02
11	Atlanta, GA	0.00	2484.16	3.378	0.12

- a. The unit for attitude accessibility is the millisecond.
- b. Adjusted accessibility refers to centered, log-transformed accessibility: the log-transformed accessibility of the city subtracted by the mean of the log-transformed accessibilities of the total eleven cities. Note that the smaller the number is, the shorter it took to answer (i.e., the faster to access attitude in the memory), and thus, the stronger the attitude is. Thus, a negative number in adjusted accessibility indicates a relatively strong attitude, whereas a positive number indicates a weak attitude.
- c. The four contextual cities

Table B2. Study 1: T-Test Results for Each City

City	Mean Attitude		<i>t</i>	<i>df</i>	<i>P</i> (2-tailed)
	When Evaluated <i>First</i>	When Evaluated <i>Second</i>			
Chicago, IL	1.39	.80	-1.74	41	.089
Newark, NJ	-1.32	-1.30	-.04	43	NS
Detroit, MI	-1.63	-1.71	-.23	41	NS
Fort Lauderdale, FL	2.00	1.62	-.98	48	NS
Kansas City, MO	-.75	-.23	1.06	44	NS
Louisville, KY	-.15	.04	.41	51	NS
New Orleans, LA	1.45	.59	-2.02	45	.050
Philadelphia, PA	.14	.18	.11	42	NS
Wichita, KS	-1.41	-.43	2.79	58	.007
Atlanta, GA	.17	.21	.11	50	NS

APPENDIX C: FIGURES

Figure C1. Four Quadrants on the Attitude Extremity–Attitude Strength Plane

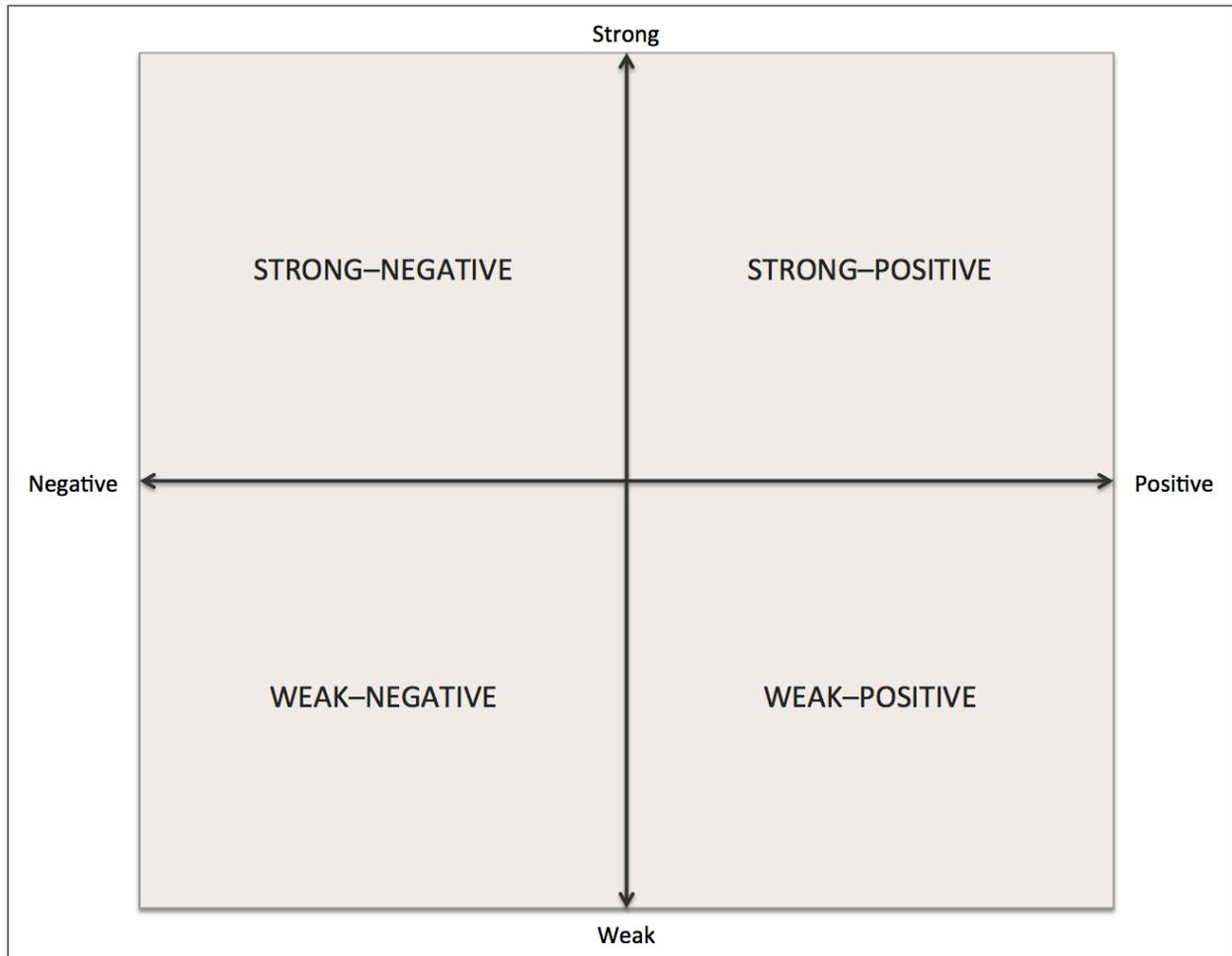
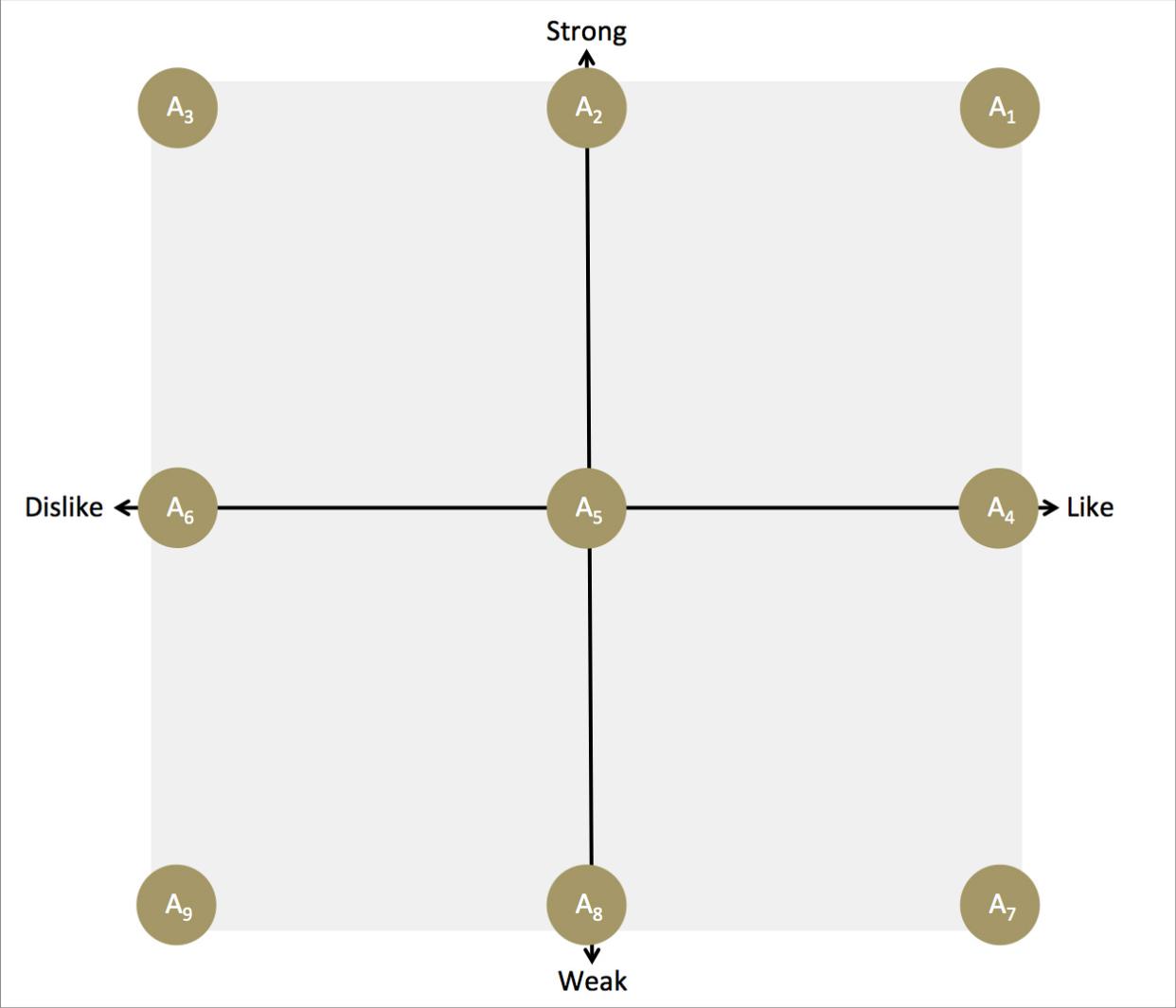
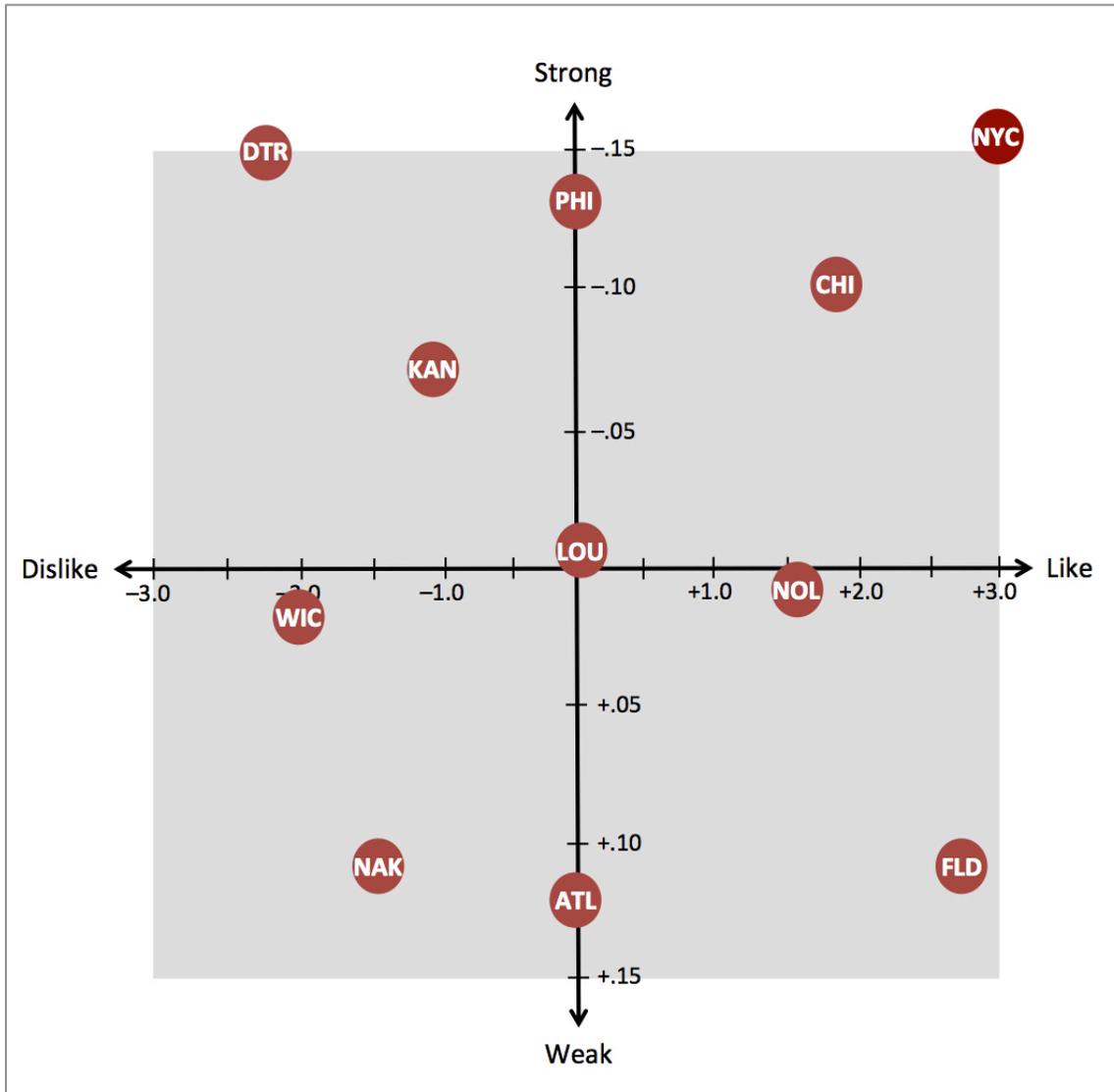


Figure C2. Fictitious Attitude Objects on the Attitude Extremity–Attitude Strength Plane



- A₁ = a strong, positive attitude
- A₂ = a strong, neutral attitude
- A₃ = a strong, negative attitude
- A₄ = a neutral–strength, positive attitude
- A₅ = a neutral–strength, neutral attitude
- A₆ = a neutral–strength, negative attitude
- A₇ = a weak, positive attitude
- A₈ = a weak, neutral attitude
- A₉ = a weak, negative attitude

Figure C3. Study 1 – Pretest: The Eleven U.S. Cities on the Evaluative Judgment Plane



- NYC = New York, NY
- CHI = Chicago, IL
- PHI = Philadelphia, PA
- DTR = Detroit, MI
- KAN = Kansas City, MO
- NOL = New Orleans, LA
- LOU = Louisville, KY
- WIC = Wichita, KS
- ATL = Atlanta, GA
- FLD = Fort Lauderdale, FL
- NAK = Newark, NJ

Figure C4. Study 1 – EPASA: Each City on the Evaluative Judgment Plane

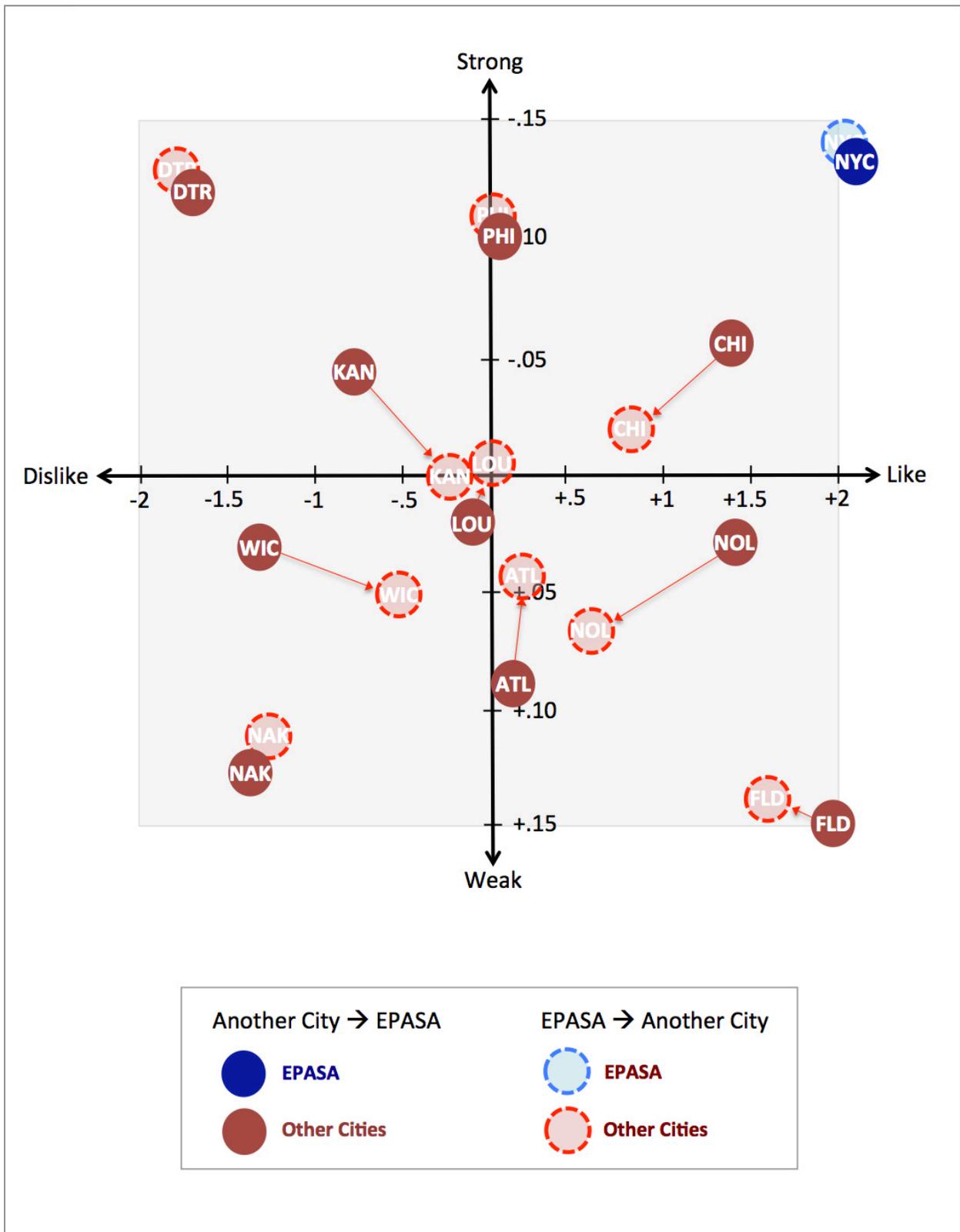


Figure C5. Study 1 – EPASA: Attitude Extremity Before and After the Context Effect

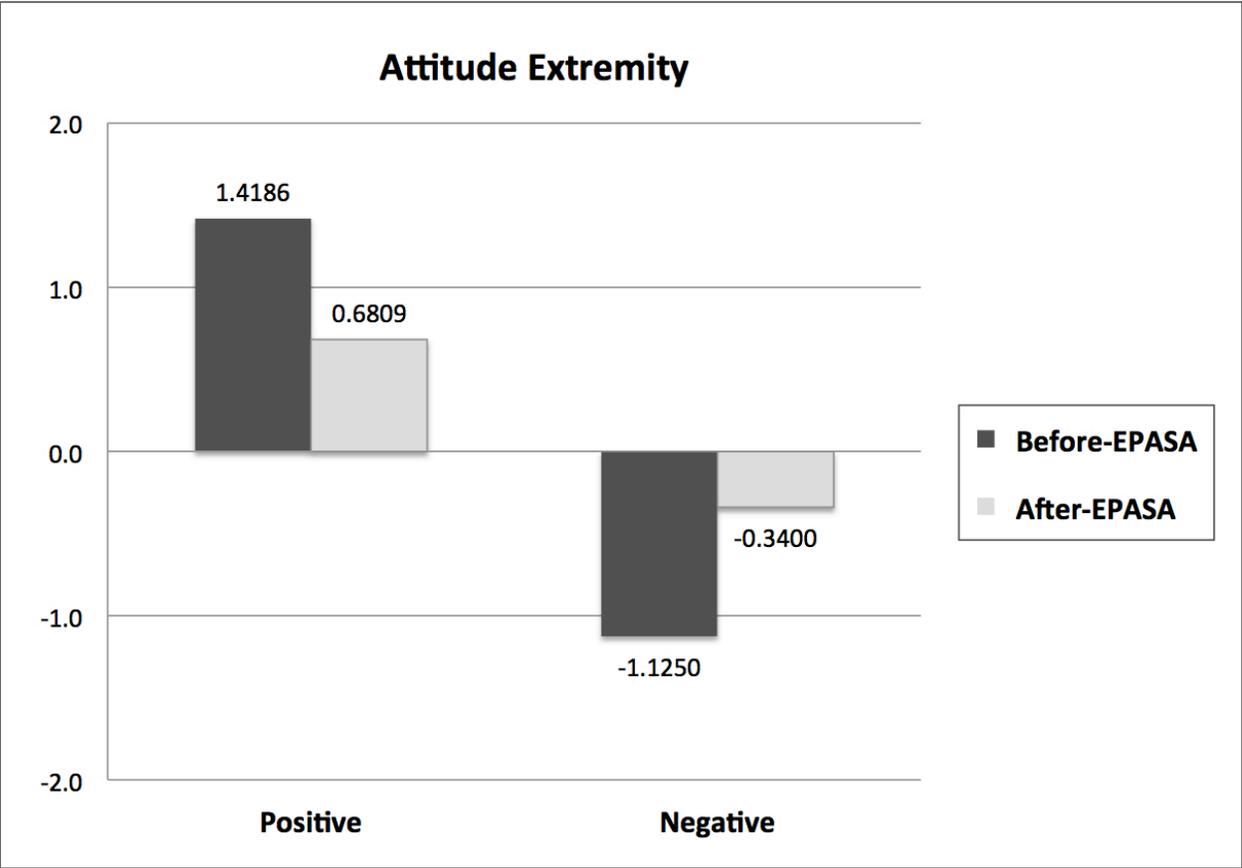


Figure C6. Study 1 – The Context Effects of ENASA

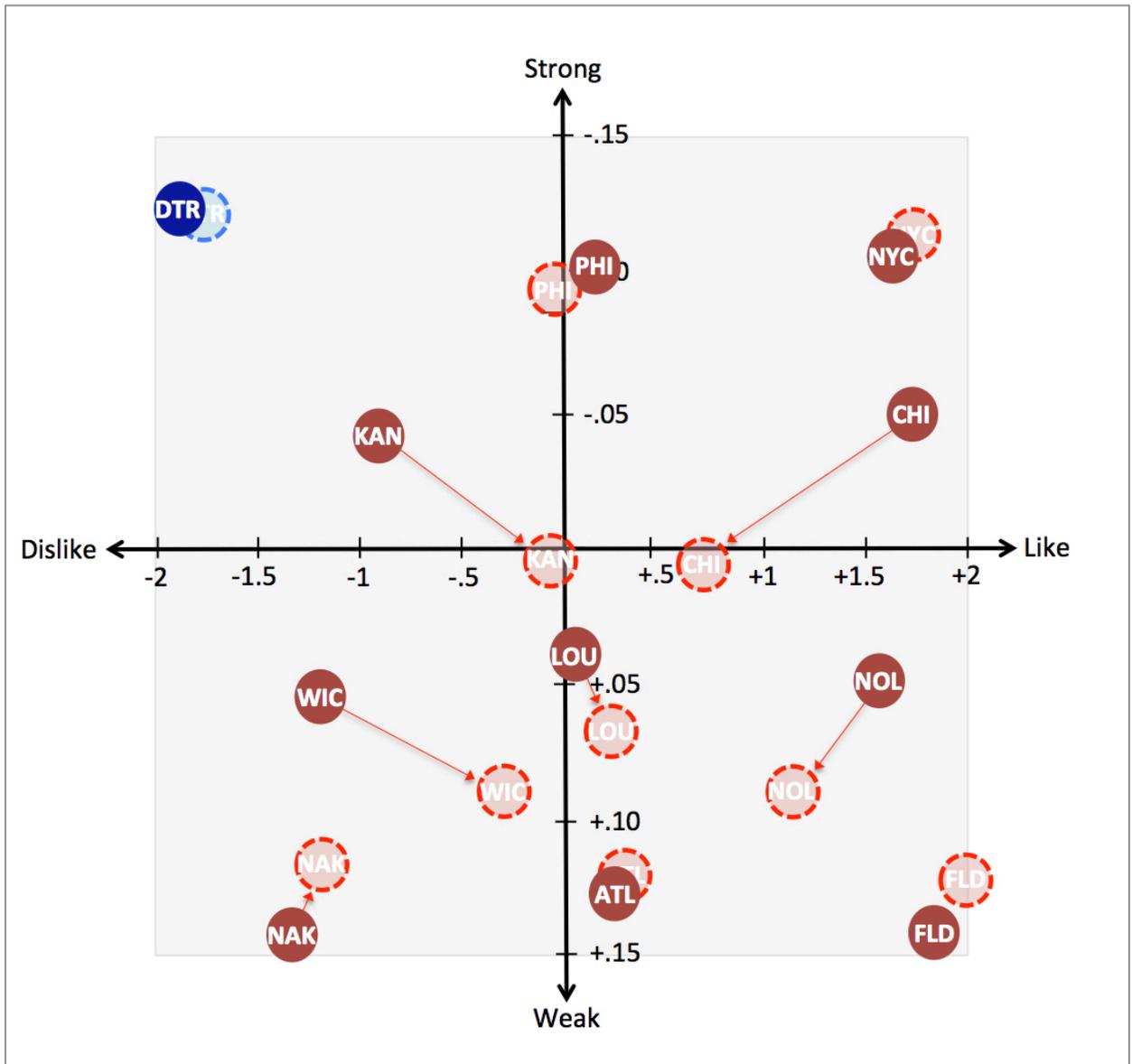


Figure C7. Study 1 – The Context Effects of EPAWA

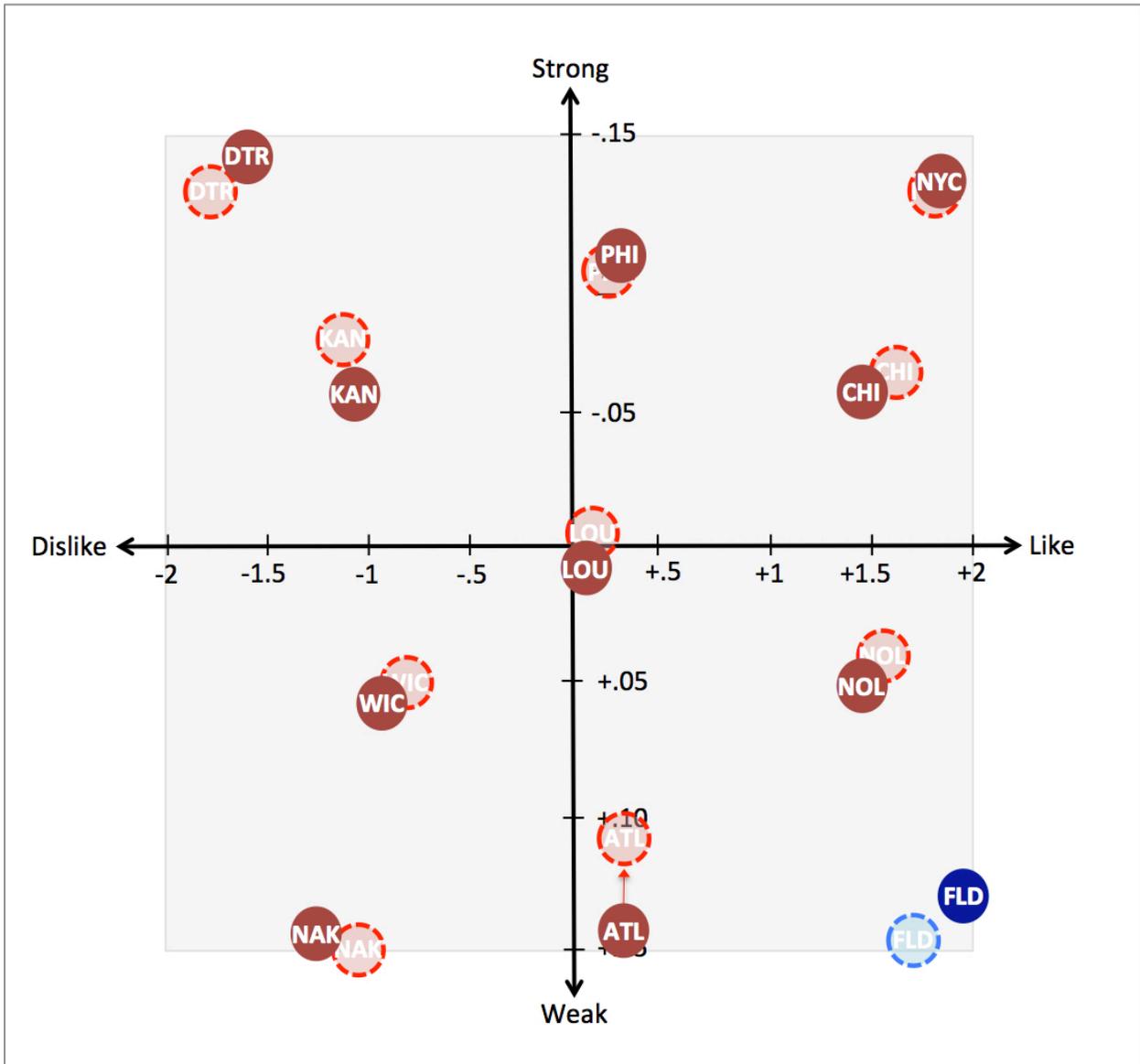


Figure C8. Study 1 – The Context Effects of ENAWA

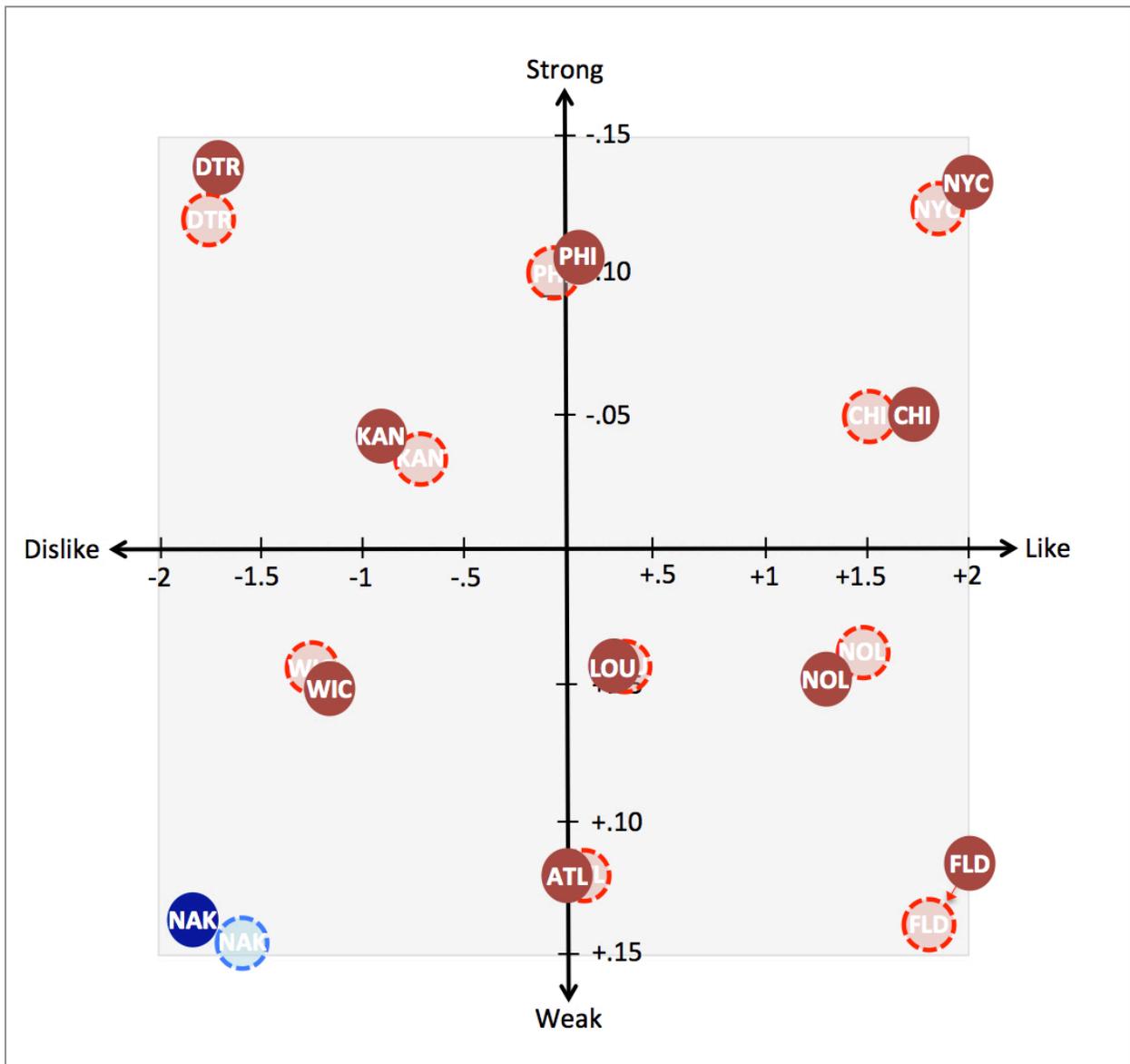


Figure C9. Study 1 – Distorted Evaluative Space by the Context Effect of the EPASA

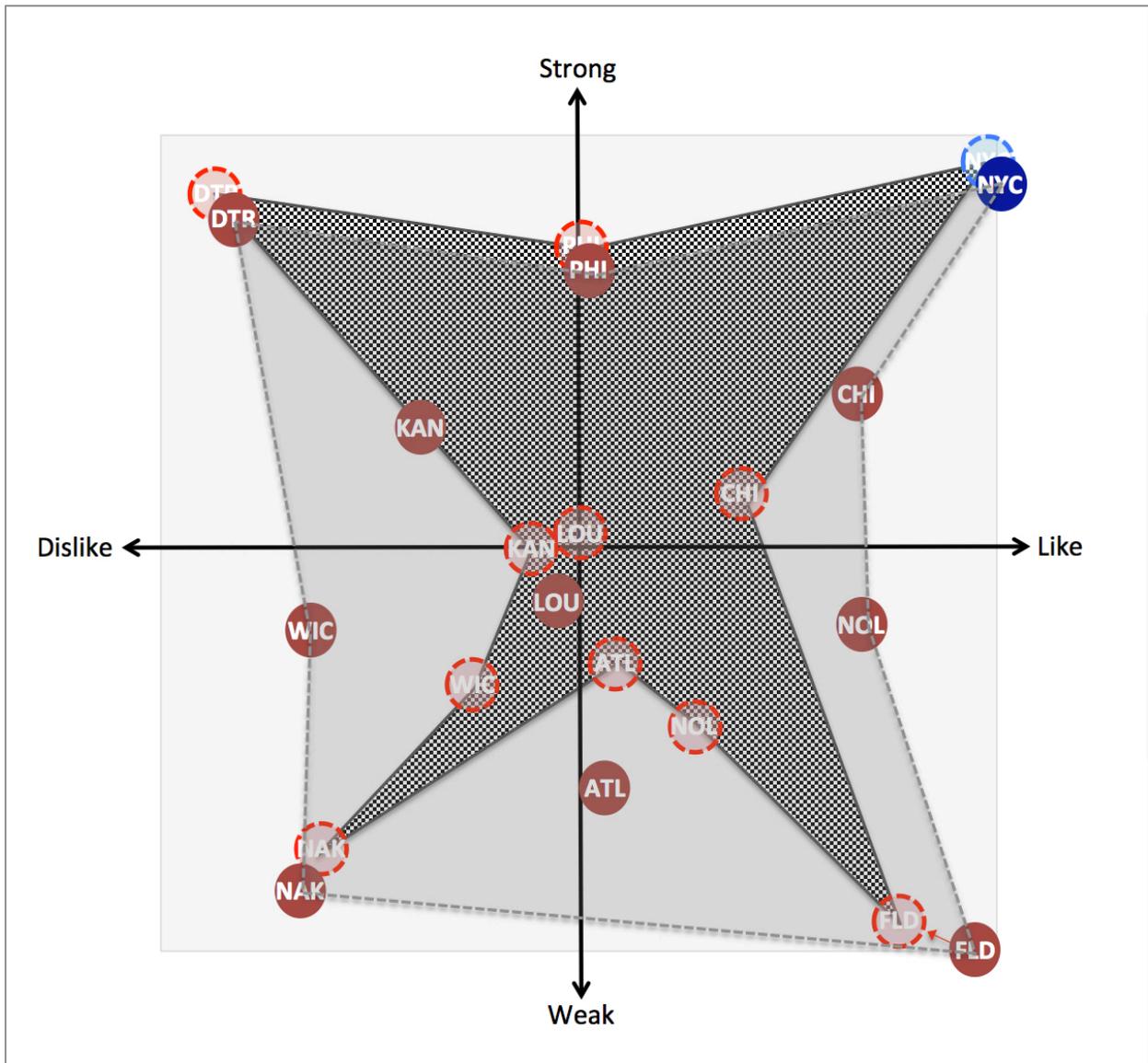
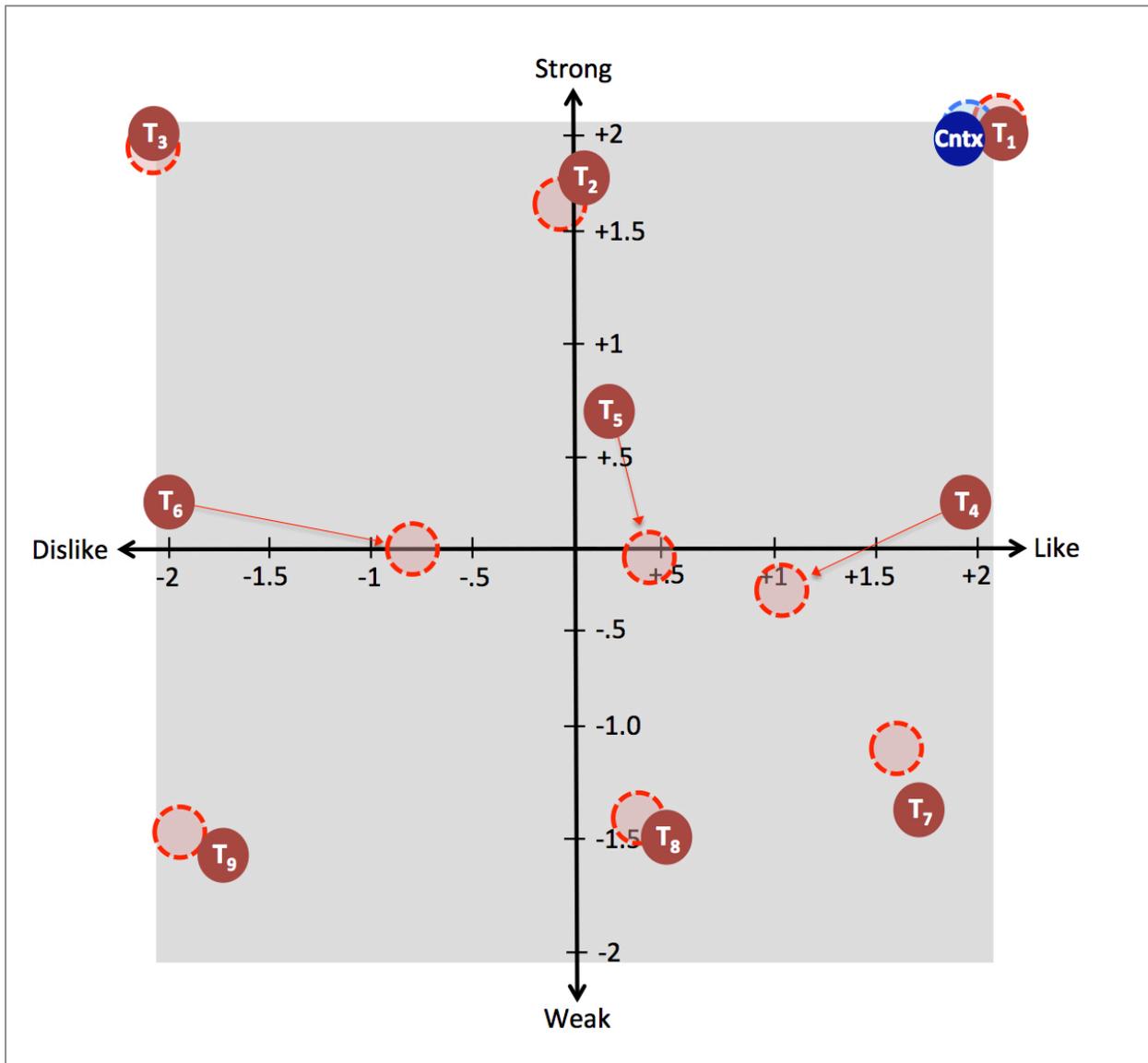


Figure C10. Study 2 – The Context Effects of a Product with a Strong–Positive Attitude



Cntx = contextual product

T₁ = a target product toward which attitude is strong–positive

T₂ = a target product toward which attitude is strong–neutral

T₃ = a target product toward which attitude is strong–negative

T₄ = a target product toward which attitude is neutral–strength–positive

T₅ = a target product toward which attitude is neutral–strength–neutral

T₆ = a target product toward which attitude is neutral–strength–negative

T₇ = a target product toward which attitude is weak–positive

T₈ = a target product toward which attitude is weak–neutral

T₉ = a target product toward which attitude is weak–negative

Figure C11. Study 2 – Evaluative Space Distortion

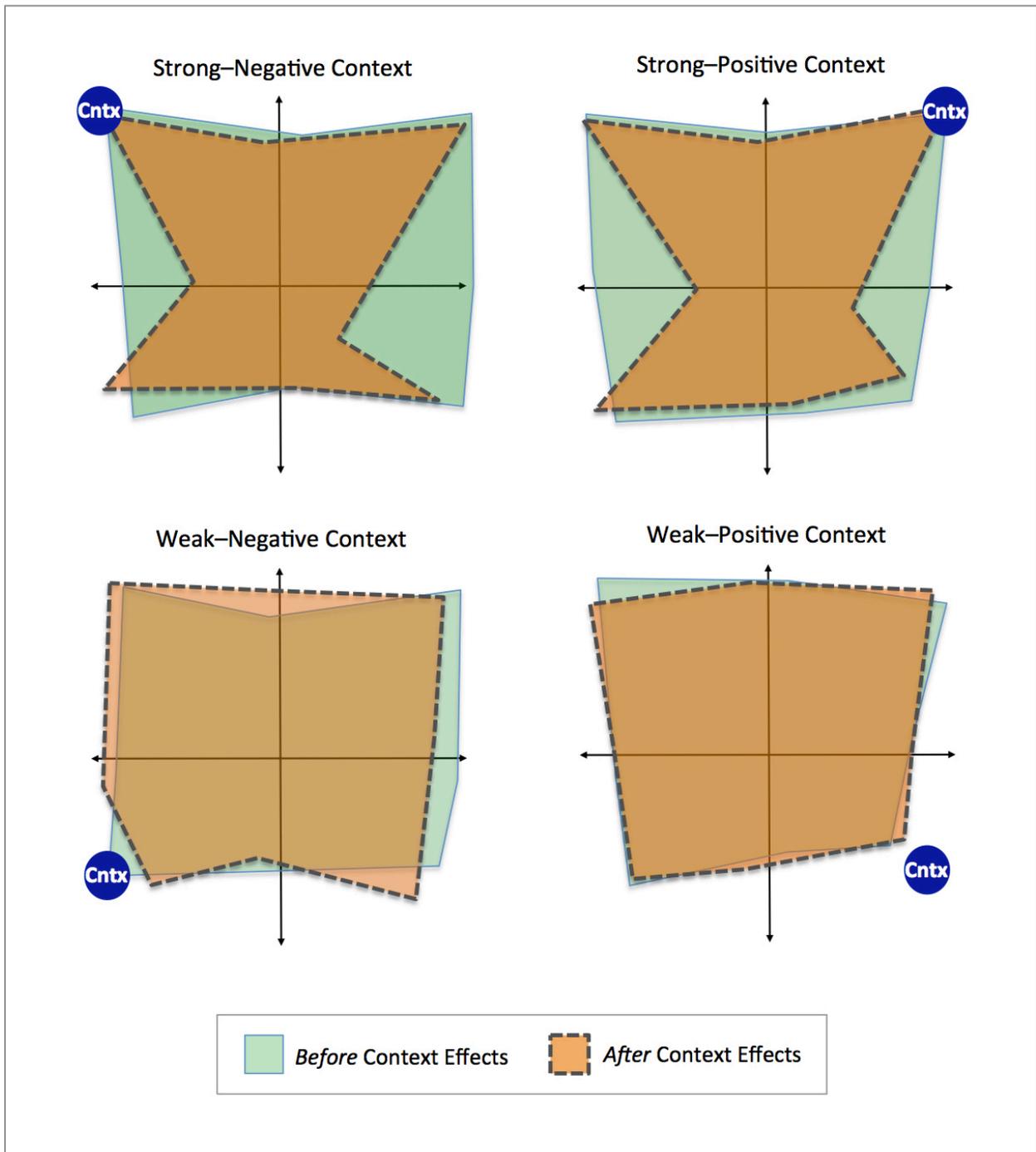


Figure C12. Study 4a – Choice Task

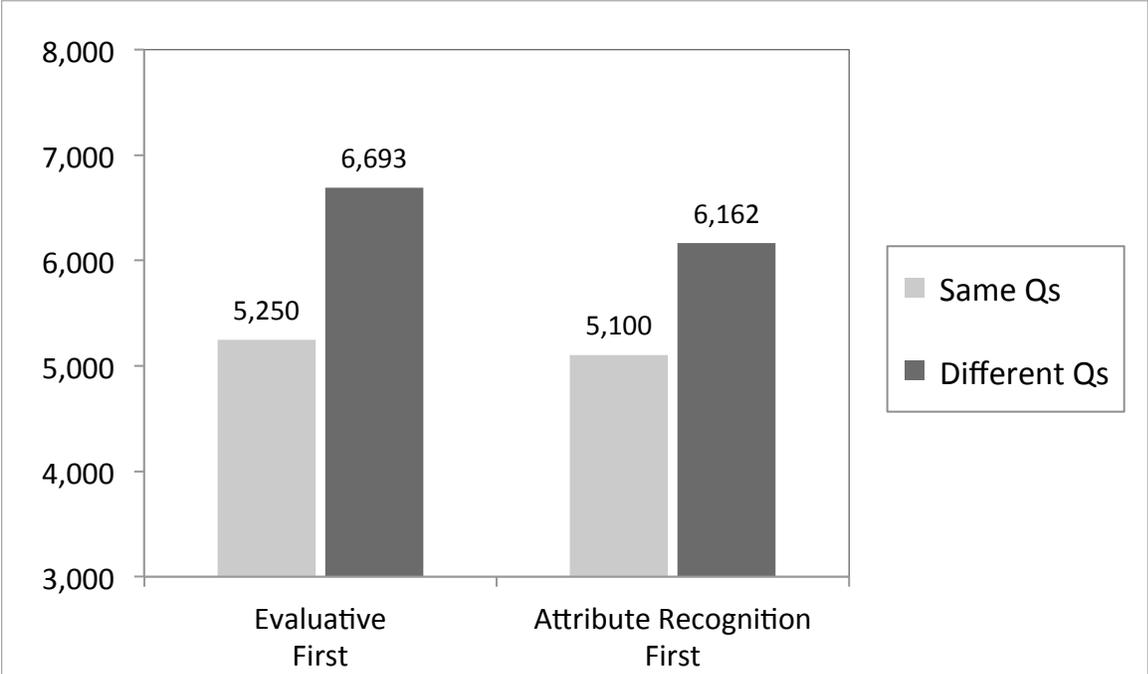


Figure C13. Study 4b – Percentage of Chosen Options

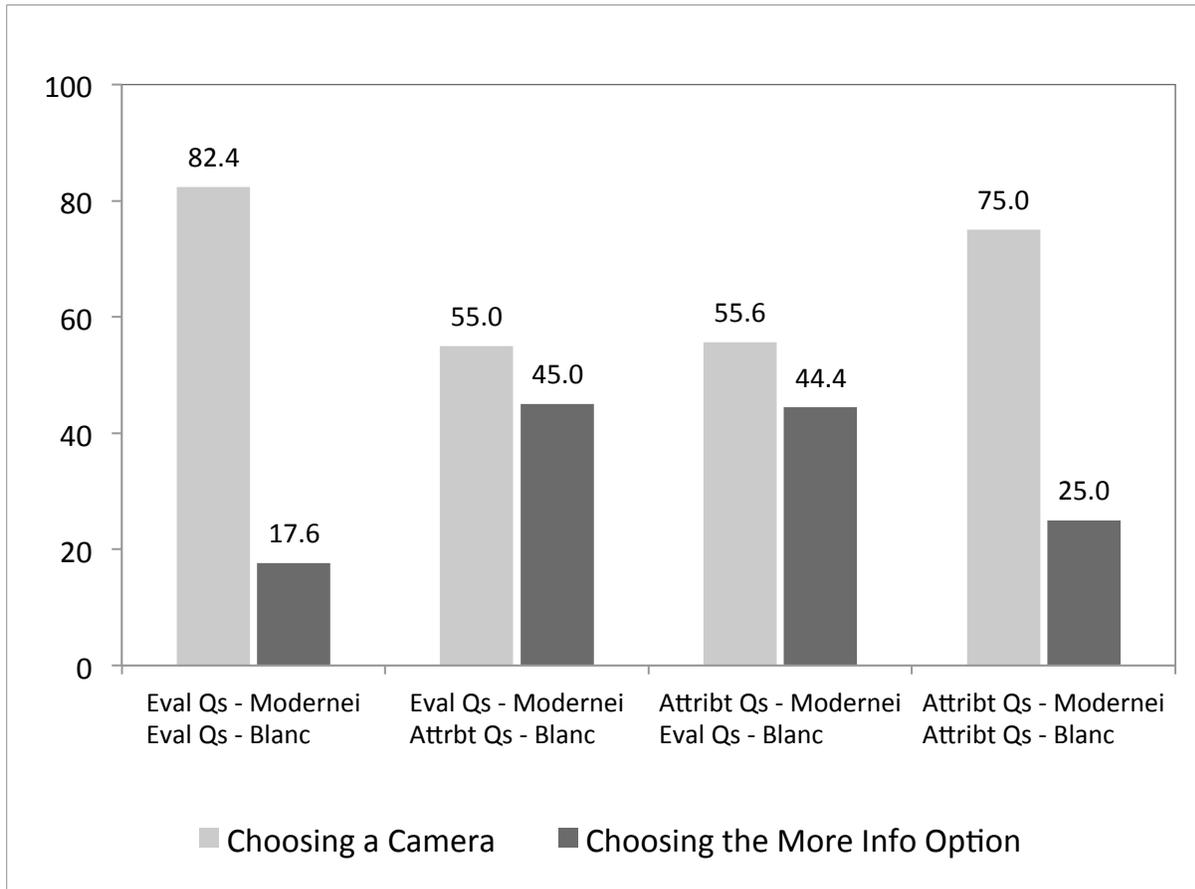


Figure C14. Study 5 – Context Effects of a Product with Strong–Positive Attitudes

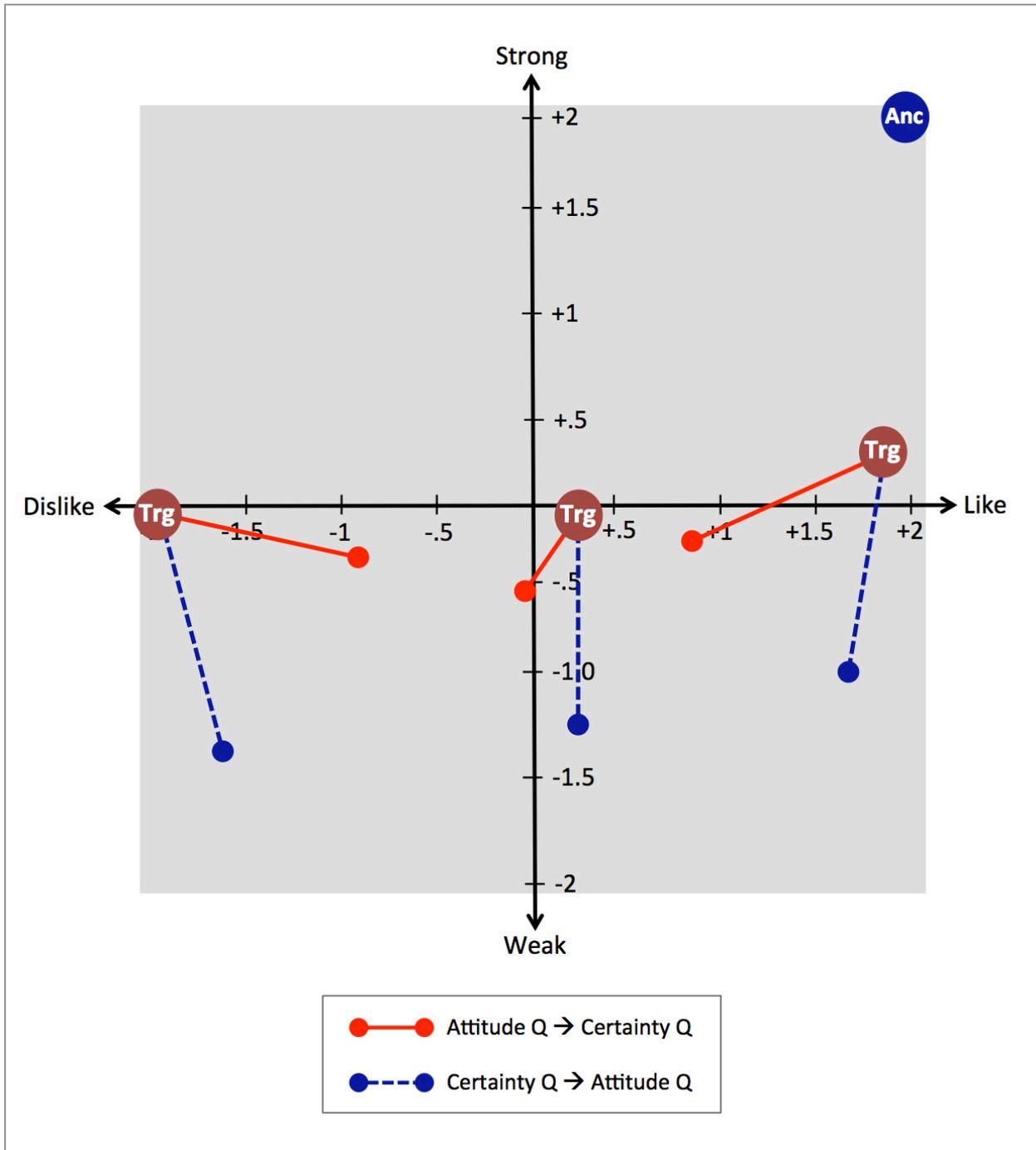
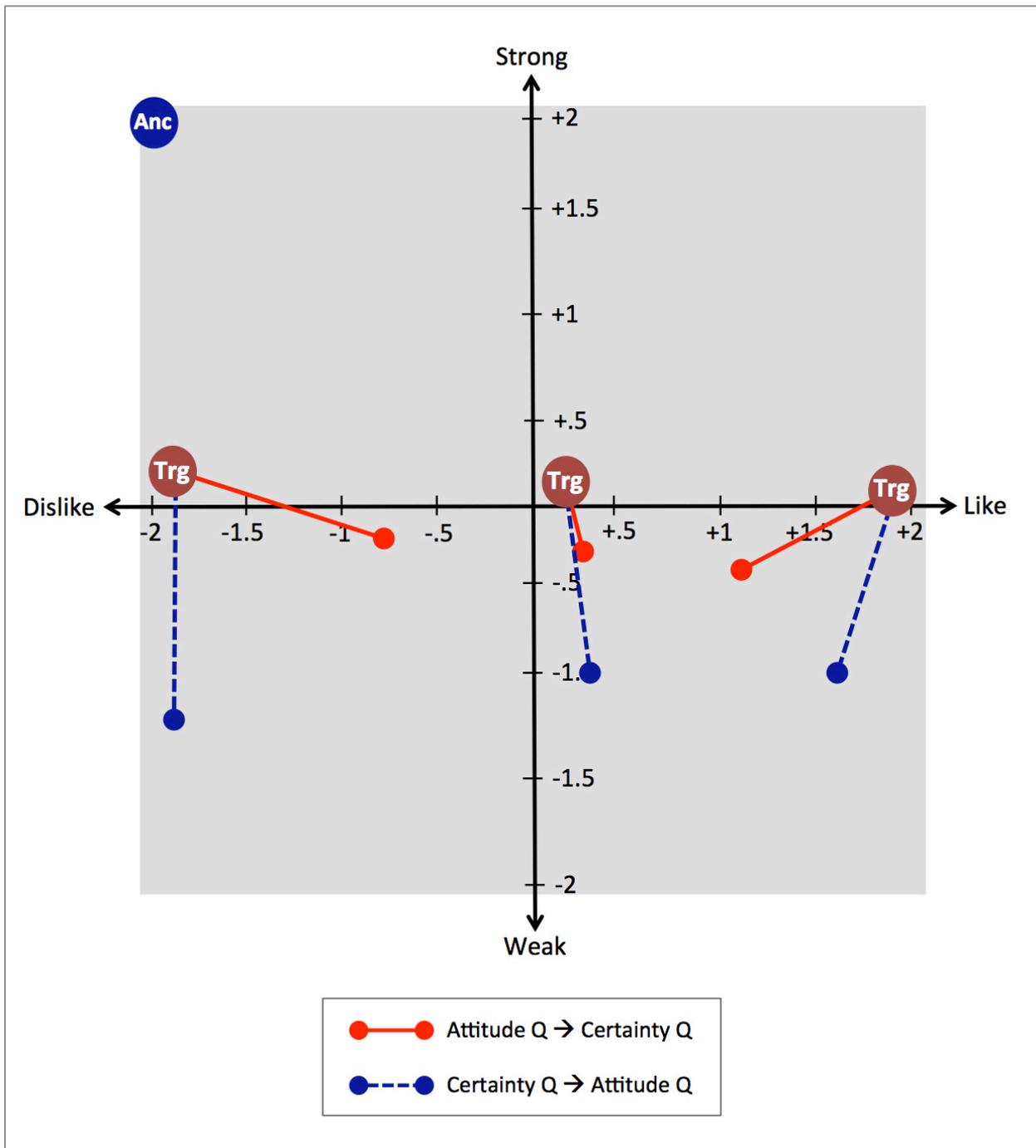


Figure C15. Study 5 – Context Effects of a Product with Strong–Negative Attitudes



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