CONSUMER SENSITIVITY TO BUNDLE CONTEXT: HOW BUNDLE COMPARISON AFFECTS BUNDLE ATTRACTIVENESS

By

DAN HAMILTON RICE

A DISSERTATION PRESENTED TO THE GRADUATE SCHOOL
OF THE UNIVERSITY OF FLORIDA IN PARTIAL FULFILLMENT
OF THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

UNIVERSITY OF FLORIDA

2008

To my Mom, Dad, fiancée Erin and sister Christie, without your support in my life, I would not have been able to attain the modest heights that I have, and to my grandmother Charlotte Galway who made me promise to never lose my sense of humor (I hope I haven't).

ACKNOWLEDGMENTS

I would like to thank my advisor, Alan D.J. Cooke, to whom I am greatly indebted for the extraordinary amounts of time and effort that he invested in guiding me through this arduous doctoral sojourn and for the wealth of knowledge, patience, and kindness that he bestowed upon me along the way. I would also like to thank Rich Lutz for his invaluable personal and professional advice and support throughout my time in the program. I thank my committee members Joseph W. Alba, Chris Janiszewski and Richard Romano for their assistance in my endeavors at the University of Florida. I thank Robyn Leboeuf for her guidance during my first year project. I would also like to acknowledge my appreciation for the aid I received from Jan Katz and Aparna Labroo in choosing a PhD program.

I feel lucky to have a strong network of friends and colleagues that I have leaned on mercilessly for emotional and psychological support during the many testing moments of this program. I am particularly grateful to Joey Hoegg, Baler Bilgin, Jesse Itzkowitz, Wouter Vanouche, Juliano Laran and Julia Belavsky for their willingness to keep me sane and grounded (albeit barely) throughout my time in the program. I thank my friends outside the program, especially Louis "Roni" Breskman, Ashleigh Cox and Rich "Gooch" Grousset, for their constant reminders that life is full of humor and in full swing outside of the ivory towers of academia. I would like to thank my family, especially my Mom and Dad, for always supporting me in my undertakings and for always believing in my abilities, even when I was in doubt. Without their love and support throughout my life, an educated hick like me would never have been able to have all the opportunities and experiences with which I have been blessed, not the least of which is the pursuit of a PhD. Lastly, I would like to thank my beautiful fiancée, Erin. Without her constant support, boundless optimism, immense love and infinite patience, I could not have advanced this far down a road definitely less traveled and accomplished this feat.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abstract of Dissertation Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Doctor of Philosophy

CONSUMER SENSITIVITY TO BUNDLE CONTEXT: HOW BUNDLE COMPARISON AFFECTS BUNDLE ATTRACTIVENESS

By

Dan Hamilton Rice
August 2008

Chair: Alan D. J. Cooke
Major: Business Administration

How does context affect consumers' reaction to product bundles? This research demonstrates that consumers are sensitive to both distributional and compositional information in the contextual set. I show that the evaluations of particular product bundles vary depending on how other products are bundled together, even when the set of contextual products is held constant. These context effects change how the target bundles are perceived, producing systematic reversals in bundle preference. I argue that these effects are due to effortful comparisons between bundles. Consistent with this account, I find that increasing the difficulty of bundle comparisons moderates the process by which consumers use bundle context. When cognitive load is high or contextual comparisons involve both bundles and single products, consumers use a heuristic in which the best product is substituted for the entire bundle.

CHAPTER 1
INTRODUCTION

Despite the prevalence of product bundles in today's marketplace, many fundamental questions remain about how consumers process information about product bundles. How is a bundle evaluation different from a single product evaluation? What comparisons do consumers make when evaluating the bundle? What factors moderate the effects of these comparisons? Researchers are only now beginning to understand the process by which bundles are evaluated and the factors affecting those evaluations.

With all of the attention that examinations of bundle evaluations have garnered in the literature, it is surprising that no research has investigated how consumers process contextual information when the context, target, or both are composed of bundles. The evaluation of individual product offers has been shown to be sensitive to dominance (Huber, Payne and Puto 1982), attribute tradeoffs (Simonson and Tversky 1992), tradeoff extremity (Simonson and Tversky 1992), attribute range and spacing (Mellers and Cooke 1994, Cooke and Mellers 1998), timing of product presentation (Wedell, Parducci and Geiselman 1987), and the extremity of the contextual products (Herr 1989), to name a few. Despite these results, little research has investigated how contextual information is processed when the target or contextual offers consist of product bundles.

To examine the ways contextual information may alter bundle judgment, consider a bundle of a TV and a DVD player evaluated in the context of additional DVD players. If the contextual DVD players are all of superior quality to the target DVD player, they should depress the evaluation of the target DVD player (Herr 1986, 1989), which should in turn depress the overall evaluation of the bundle. However, this is not the only way context can alter bundle perceptions. Suppose the TV/DVD player target bundle was displayed among other bundles of

TVs and DVD players. Here, contextual information is available not only in the distributions of each product category, but also in the joint distributions of quality across different bundles containing these products. This compositional information may also serve as a context relative to which bundles are evaluated.

The primary goal of this research is to demonstrate that consumers are sensitive to how single contextual products are combined into bundles when evaluating target stimuli. To avoid confusion, I refer to this previously unexplored compositional contextual information as "bundle context," and the context created by single products as "single product context." After demonstrating the existence of bundle context effects, I further examine the process by which consumers account for the bundle context and explore moderators of the effects. I propose that the influence of bundle context is due to effortful comparisons between the bundle and the surrounding context, and the relative difficulty of these comparisons moderates the effects of the context.

The paper proceeds as follows. Chapters 2 and 3 review the marketing literature on product and bundle evaluations and other relevant literatures that bear on the explanation of how context will influence bundle evaluations. Chapter 2 introduces concepts from the consumer information processing literature to explore how consumers evaluate products and reviews the evidence of contextual influences on single product evaluations. Chapter 3 how the evaluation process differs between single products and bundled products, and how bundle evaluations can be influenced by bundle context. Chapters 4 through 7 provide the methodology, data analysis, results and discussion of four experimental studies. Chapter 8 includes a general discussion of the results of the four experiments which explores the implications of these findings for the field of marketing and potential areas for future research.

CHAPTER 2
PRODUCT EVALUATION AND THE INFLUENCE OF CONTEXT

Prior research in consumer behavior has shown that single product evaluations and preferences are rarely stable. Consumers generally process available and convenient information to construct their evaluations and preferences at the time of judgment (Bettman, Luce and Payne, 1998). This construction process allows preferences to be affected by the context in which particular products are presented. This chapter will review the relevant work that explores how consumers form evaluations of single products and how context effects can influence single product evaluations.

Single Product Evaluation

The Judgment Process

Information integration theory (IIT) (Anderson 1981) has been used as a framework to explain judgment processes by numerous researchers in psychology and marketing (e.g., Anderson 1981; Birnbaum 1974; Chakravarti and Lynch 1983; Mellers and Birnbaum 1983; Mellers and Cooke 1994). In this conceptualization, the (objective) physical cues of the stimuli's attributes a and b are represented by φ_a and φ_b, respectively. These stimuli are transformed by the "psychophysical function" (H) to the *perceived* scale values of s_a and s_b (where $s = H(\varphi)$). These subjective scale values do not have to perfectly correspond to the physical cues. The scale values are then "integrated" into the internal impression (Ψ_{ab}) of the overall product by the function C, such that $\Psi_{ab} = C[s_a,s_b]$. The integrated impression is then translated to the response scale by the strictly monotonic response function (J) to arrive at the overt response on a given scale. This framework is convenient because it allows for many possible functions to be used at each stage of the decision process, and this flexibility becomes particularly important in the exploration of the bundle evaluation process in Chapter 3.

Potential Loci of Context Effects

It is important to note that every value in the IIT process except the physical cue (φ) is subjective and vulnerable to context effects. Context effects can potentially occur in any one of the three functions (H, C or J). If the effects act upon the H or C function, they are referred to as "representational" effects[1] because there is a difference in the way that product is perceived internally by the consumer between contexts (Chakravarti and Lynch 1983). When the context effects occur in the response function (J), the internal representation of the product is the same in different contexts, and it is simply the overt response that shows a difference due to semantics or specific response scales (Chakravarti and Lynch 1983; Mellers and Cooke 1994).

Consider the two context conditions with a wide and a narrow range of an attractiveness attribute shown in the three panes of Figure 2-1. In the wide range context (left pane), the focal items C and D are perceived to be of moderate attractiveness when viewed with items A and B, and the difference between the ratings for C and D on the response scale (denoted by a delta in each pane) is relatively small. The middle and right-hand panes represent the representational and response language explanations of how this delta may enlarge between contexts. In a representational change (middle pane), the perceived attractiveness of C and D will appear larger to the consumer, and the larger delta will be driven by this perception. If response language is the cause of the enlarged delta (right-hand pane), the perceived difference between C and D will be the same between contexts, and only the overt response will change due to changes in anchoring of the response scale.

[1] Representational effects have also been further classified as "perceptual effects" if occurring in the H function or as "weighting effects" if occurring in the C function (Mellers and Cooke 1994), but this distinction is not necessarily important if only trying to demonstrate that the effects cannot be accounted for by response language.

Although the distinction between different loci may seem trivial, it holds large implications for marketers. Chakravarti, Lynch, and Mitra (1991) argue that "response language" is less likely than a "representational" locus to cause changes in subsequent behavior, which makes representational effects of greater interest when studying topics in marketing where a change in behavior is desired. For example, a contextual manipulation that causes a representational change and changes purchase patterns is more interesting than one that simply changes overt responses to a questionnaire and leaves purchase patterns untouched.

Accounting for Context Effects Through Stimuli Distributions

Context effects are a well-established concept in the marketing and psychology literatures. One stream of context effects research investigates how stimulus perceptions depend on the distribution of attribute levels of previously viewed stimuli. This section will review selected research illustrating how attribute level context effects have been demonstrated in evaluations of single stimulus and highlight the key findings that are pertinent to the current paper.

Adaptation Level Theory

Adaptation Level Theory (Helson 1964; Michaels and Helson 1949) has often been used in the marketing literature to describe consumer price perceptions (e.g., Della Bitta and Monroe, Lewis 2006; Monroe, Niedrich et al. 2001). Originally, Helson (1964; Michaels and Helson 1949) devised the theory to account for contextual effects in the evaluation of sensory stimuli based on the Weber-Fechner law (Fechner 1898/1987), which states that the difference in response (i.e., perceived difference) between two stimuli (Δs) is related to the difference in the logarithms of the physical intensity of the stimuli by the Equation 2-1, where c is a constant and φ_i and φ_o are the stimuli being compared.

$$\Delta s = c * \text{Log}\,(\varphi_i/\varphi_o) \qquad (2\text{-}1)$$

Helson (1964) theorized that a stimulus would be evaluated relative to the geometric mean of the previously experienced levels of the physical cues, a point which he termed the "adaptation level" (AL). The perceived difference between the cue and the adaptation level would be proportional to the difference between the logarithms of the cue and the adaptation level. This difference would be given by Equation 2-1 where φ_i is the stimulus and φ_o is the AL. The impression of the stimulus ($\Psi_{AL,ik}$) would simply be related to the perceived difference from the AL by a constant, c. Alternatively, the AL is sometimes calculated as the arithmetic mean of the perceived levels of the stimuli[2]. In this form of the theory, the explicit equation for the predicted internal judgment ($\Psi_{AL,ik}$) of stimulus i in context k with an adaptation level of $s_{al,k}$ is shown in Equation 2-2, where a and b are constants that represent the intercept and slope of the integration function and s_{ik} is the perceived value of stimulus i (Helson 1964; Niedrich et al. 2001).

$$\Psi_{AL,ik} = a + b(s_{ik} - s_{al,k}) \qquad (2\text{-}2)$$

While ALT has been used in marketing research to explain price perceptions and responses to these perceptions (e.g., Della Bitta and Monroe 1974; Lewis 2006; Monroe 1971), it implies that any context with the same AL ($s_{al,k}$) should have the same influence on a particular stimulus regardless of the range or distribution of the contextual stimuli. ALT has generally been shown to be less accurate than other theories in predicting context effects when directly compared (e.g., Janiszewski and Lichtenstein 1999; Niedrich et al. 2001; Parducci 1965), though situations do exist where this theory does provide reasonable fit to data (Niedrich et al. 2001).

[2] As Niedrich et al. (2001) explain, this form of the theory (Helson 1964, Niedrich et al. 2001) assumes that the psychophysical function (H(φ)) "is logarithmic, where the arithmetic mean of the subjective values [(s_{ik}'s)] is equivalent to the geometric mean of the physical values [(φ_{ik}'s)],"(p.341).

Range Theory

Range theory (RT, Volkmann 1951) is another theory that has been used to account for contextual effects in price perception (e.g., Janiszewski and Lichtenstein 1999; Niedrich et al. 2001) and product evaluations (e.g., Mellers and Cooke 1994). RT like ALT was originally created to deal with sensory perception. Unlike ALT, RT proposes that it is not a single mean value, but rather the extreme values of the contextual stimuli that anchor the upper and lower ends of the evaluation scale. This conceptual difference allows RT to account for differences in evaluations of a stimulus in contexts with the same AL, but different ranges, which ALT cannot explain. The overall impression of the stimulus i in context k ($\Psi_{RT,ik}$) is then related to the location of the stimulus relative to the high and low extremes by Equation 2-3, where s_{ik} is the scale value for stimulus i, $s_{max,k}$ is the scale value for the maximum stimulus in the set and $s_{min,k}$ is the value for the minimum stimulus in the set (Niedrich et al. 2001; Wedell et al. 1990).[3]

$$\Psi_{RT,ik} = (s_{ik} - s_{min,k})/(s_{max,k} - s_{min,k}) \qquad (2\text{-}3)$$

More generally, the difference in impression between any two stimuli i and n in the set can be described by Equation 2-4, where $\Psi_{RT,nk}$ is the impression of stimulus n in context k, and s_{nk} is the scale value for stimulus n in context k, and the other variables remain as labeled in Equation 2-3.

$$\Psi_{RT,ik} - \Psi_{RT,nk} = (s_{ik} - s_{nk})/(s_{max,k} - s_{min,k}) \qquad (2\text{-}4)$$

Equation 2-4 has an important implication for stimulus evaluation and marketing judgments. A constant difference between the two stimuli scale values (shown in the numerator

[3] For convenience, the equations depicting RT and RFT in this section were consistent with Niedrich et al. (2001), where the context effects are shown as occurring in the integration function. It has been shown that context effects can also affect the psychophysical and response functions. The inputs and outputs would be slightly different in those equations. For simplicity they have been omitted herein.

of Equation 2-4) should lead to a greater perceived difference in impression between stimuli in a smaller range than a larger range (due to a smaller denominator value).

Range effects consistent with this implication have been demonstrated in research topics ranging from triangle size perception (Volkmann 1951) to price perception (Janiszewski and Lichtenstein 1999; Niedrich et al. 2001) to product preference (Mellers and Cooke 1994), and the effect has been demonstrated with both single attribute stimuli (Volkmann 1951) and multiattribute stimuli (Mellers and Cooke 1994). From a marketing perspective, these findings are important because they demonstrate that the evaluations of the same product offering can vary to the point of choice and preference reversals based on the range of attribute values exhibited by other products (i.e., Lynch et al. 1991; Mellers and Cooke 1994) in the contextual set. Direct tests between ALT and RT (e.g., Janiszewski and Lichtenstein 1999; Niedrich et al. 2001) have shown that RT generally has greater predictive power than ALT.

Range-Frequency Theory

While RT (Volkmann 1951) may explain contextual effects more accurately than the ALT model (Helson 1964), the theory implies that any contextual set with the same range should exert the same influence on evaluations regardless of the distribution of stimuli within that range. To address this issue, Parducci (1965) developed range-frequency theory (RFT), which combines RT with a method to account for frequency distributions. The frequency principle (Parducci 1965) states that the impression of a stimulus will depend upon its percentile rank within the contextual distribution. Specifically, the frequency-based impression of stimulus i in context k ($\Psi_{F,ik}$) can be calculated with Equation 2-5, where $Rank_{ik}$ is the rank of stimulus i in context k and N_k is the total number of stimuli in the context (Niedrich et al. 2001; Wedell, Parducci, and Lane 1990).

$$\Psi_{F,ik} = (Rank_{ik} - 1)/(N_k - 1) \qquad (2\text{-}5)$$

As Equation 2-5 demonstrates, the impression of stimulus i depends upon how many stimuli are spanned between the lowest ranked stimulus and stimulus i. More generally, the difference in impression between two stimuli in a distribution can be calculated with Equation 2-6, where $\Psi_{F,nk}$ is the impression of stimulus n according to the frequency principle and $Rank_{nk}$ is the rank of stimulus n in the distribution.

$$\Psi_{F,ik} - \Psi_{F,nk} = (Rank_{ik} - Rank_{nk})/(N_k - 1) \qquad (2\text{-}6)$$

The important implication of Equation 2-6 is that the greater the percent of the distribution spanned by the two stimuli, the greater the difference between the two stimuli will be perceived. Evidence of this implication of the frequency principle has been demonstrated in topics ranging from social judgment (Mellers and Birnbaum 1983) to price perception (Niedrich et al. 2001) to product preference (Cooke and Mellers 1998).

RFT combines the impression from the frequency principle ($\Psi_{F,ik}$) with the impression from RT ($\Psi_{RT,ik}$) to arrive at an overall impression of a stimulus i in context k ($\Psi_{RFT,ik}$) by multiplying each component by weighting factors which sum to 1 in the Equation 2-7 (Niedrich et al. 2001), where w is a weighting factor with a value between 0 and 1 with values usually being around .5 (Niedrich et al. 2001; Wedell et al. 1990).

$$\Psi_{RFT,ik} = w(\Psi_{R,ik}) + (1-w)\Psi_{F,ik} \qquad (2\text{-}7)$$

In judgment research, RFT has been shown to be generally more effective at predicting results than either RT or ALT (Birnbaum 1974; Niedrich et al. 2001; Parducci 1965), though cases do exist where RT and ALT fit the data well (see Niedrich et al. 2001 for specific examples).

Accounting for Context with Attribute Relationships and Tradeoffs

The prior methods of accounting for context effects have been used primarily for experiments where one attribute, which is monotonically related to judgment, is manipulated

individually. However, there are cases where the relationship between levels of attributes in the stimuli may also be an important consideration for contextual influence. This section examines some of the major findings in this general area.

Tradeoff Contrasts

Simonson and Tversky (1992) explore the dynamics of tradeoff contrast by extending the concepts of contrast effects from single attributes (e.g., a person looks tall compared to short people and short compared to tall people, etc.) to attribute tradeoffs. The authors argue that the choice between two non-dominant options x and y which vary on two attributes will change between contexts with choice options a and b versus c and d which create different tradeoffs between attribute levels in the contextual choices. Consumers will favor the focal option (x or y) which has the relatively favorable tradeoff based on exposure to the contextual choice.

For the illustrative example used by Simonson and Tversky (1992), the tradeoff between a and b requires a large amount of attribute 2 be given up to get a small amount of attribute 1 relative to the tradeoff required in the focal x vs. y choice. In this context, consumers will tend to prefer option y because they gain a large amount of attribute 1 for a small amount of attribute 2 (relative to the tradeoff in the contextual reference). The opposite would be true in the context of c and d. In this case, consumers would prefer option x because there would be a better tradeoff in attribute 2 gain for the amount of attribute 1 lost relative to the context.

Enhancement and Detraction Effects: Enhancement and detraction effects (Simonson and Tversky 1992) refer to particular types of tradeoff contrasts where choice patterns between the same options are affected by the presence or absence of a third option in different contexts. Consider the two-attribute alternatives w, x, y, and z described by Simonson and Tversky (1992), where there is no strong preference between x and y or between w and z. Choosing between options in the {x, y} set requires that the x-y tradeoff be made with no contextual tradeoff

information and leads to a relatively even choice split between x and y. However, the addition of z to make the choice set {x, y, z} creates two new tradeoffs to contrast in the set. Comparing the x-z tradeoff to the x-y tradeoff favors y because the move from x to y increases almost as much on attribute 1 as the x-z move with a lesser loss on attribute 2. Likewise, the comparison of the x-z tradeoff to the y-z tradeoff favors y because the move from z to y increases nearly as much attribute 2 as the z to x move with a smaller loss on attribute 1. These tradeoffs which are favorable to y lead to a violation of regularity[4] where the probability of choosing y is greater in the {x, y, z} set than in either the set {x,y} or the set {y, z}. This effect is referred to as the enhancement effect (Simonson and Tversky 1992). Now consider the choice sets {w, z} and {w, x, z} described by Simons and Tversky (1992). In the first case, there is again no tradeoff context in which to compare the w-z tradeoff, but the addition of the option x to create the choice set {w, x, z} creates two new compares through which to compare the options. In this case, the comparison of x-z to w-x is unfavorable to w because only slightly more attribute 2 is lost by moving from x to z than x to w, but z offers a large increase in attribute 1 over w. Likewise, the w-z comparison is unfavorable to the x-z comparison because moving from z to x requires a loss of only slightly more attribute than the move from z to w for a large gain in attribute 2. In this case, option w is less preferred in the {w, x, z} set than either the {w, z} set or the {x, w} set. This phenomenon is called the detraction effect (Simonson and Tversky 1992) because the middle option fares worse in the three option set than the two option set.

In later work, Tversky and Simonson (1993) argue that these contrasts are due to differential weighting of the attributes due to contextual manipulation. However, work by

[4] The regularity condition is a necessary assumption of many choice models (e.g., Luce 1977; McFadden 1973; Tversky 1972). Regularity asserts that the addition of a new option in the choice set will take choice share from the existing options, and that the choice share of any existing option should never increase with the addition of another choice option.

Wedell (1998) suggests that a value shift (i.e., a "perceptual effect"- Mellers and Cooke 1994) caused by range manipulations is more likely to be the driving force behind the effect. In the Wedell (1998) study, the data implicated that in some cases there was actually a weight shift to the wider ranged attribute, which would predict an opposite choice pattern than the pattern found which was consistent with a value shift model (Wedell 1991).

Attraction Effects and Extremeness Aversion

Attraction effects

Attraction effects (Huber, Payne and Puto 1982; Huber and Puto 1983) occur when a choice that is inferior on all dimensions to one item (i.e., dominated), but not another item is added to an existing choice set. The addition of this "asymmetrically dominated" (Huber, Payne and Puto 1982) alternative to a choice set can lead to violations of the regularity condition and the similarity hypothesis,[5] where the choice share of one item increases with the addition of an item it asymmetrically dominates, and this effect increases the more similar the new item is to the benefitting item (Huber, Payne and Puto 1982).

A number of explanations have been offered for this effect. Huber et al. (1982) investigated the results with RFT and found that manipulations of attribute levels within the dominated alternative could not explain the choice effects. Wedell (1991) supported these findings by demonstrating that the asymmetric dominance directly increased the value of the dominant option in a manner that could not be accounted for by RFT. Wedell (1991) does not offer an explanation of the specific choice process, but notes that the results are congruent with both the ease of justification explanation (Simonson 1989) and the majority of confirming dimensions heuristic (Russo and Dosher 1983). More recently, Simonson and Tversky (1992)

[5] The similarity hypothesis states that choice share taken by a new option will come disproportionately from the more similar options in the original choice set.

suggest that asymmetric dominance is simply a special case of the enhancement effect that can be parsimoniously explained by tradeoff contrasts. In support of the tradeoff contrast theory, which allows for enhancement effects with "nearly dominant" alternatives, Wedell (1998) found that asymmetric dominance may enhance the effects of tradeoff contrasts, but range manipulations can still cause similar effects in the absence of a truly dominant option (see also Wedell and Pettibone 1996) .

Extremeness aversion

Research has demonstrated that losses tend to "loom larger" than gains of objectively the same size in both risky and riskless choice situations (Kahneman and Tversky 1979; Tversky and Kahneman 1991). Although the principle of loss aversion is often used to describe choice patterns between gains and losses relative to a common neutral point (e.g., Kahneman and Tversky 1991), the application of the principle to multi-attribute stimuli choice patterns allowed Simonson and Tversky (1992) to offer an explanation of two forms of extremeness aversion effects: compromise and polarization. The difference between the two types of extremeness aversion relates to the perceived losses and gains along multiple attributes. Consider the situation described by Simonson and Tversky (1992) with choice set {x,y,z}, where the middle option, y, has a small advantage and a small disadvantage to each of two extreme points, x and z. The options contain varying levels of two attributes and fall on a straight line in a two-dimensional plot. When compromise effects occur, the loss aversion will occur along both attributes (thus favoring the middle option). Polarization occurs when losses loom larger on only one attribute (or much more strongly for one attribute) and leads to a higher preference for the extreme option with the most favorable value on the attribute with the greater loss aversion.

Recent work in psychology has investigated the compromise effect and has found support for loss aversion as a driver of these effects (Usher and McClelland 2004), though other work

has suggested that loss aversion is not a necessary assumption to show these effects (Roe, Busemeyer and Townsend 2001).

Categorical Context Effects

Another stream of research has focused on how evaluations of a target depend on how the target is categorized relative to contextual stimuli (Herr 1989; Meyers-Levy and Sternthal 1993; Wänke, Bless and Schwarz 1999a,b) and the cognitive resources available to make these categorizations (Meyers-Levy and Sternthal 1993; Meyers-Levy and Tybout 1997).

Assimilation and Contrast: Sherif, Taub and Hovland (1958) are often cited for work that illustrates the interpretation of a stimulus is dependent upon the extremity of an anchoring referent relative to the stimulus. In a series of experiments with weights, Sherif et al. (1958) found that if the stimulus was only slightly different from the anchoring referent, evaluations of the rated stimulus would assimilate, or move closer to, the referent. However, if the referent was sufficiently extreme in relation to the stimulus, ratings of the stimulus would contrast, or move away from the referent. These findings have also been demonstrated more recently in evaluations of fictitious animals (Herr, Sherman and Fazio 1983), people (Herr 1986), cars (Herr 1989) and restaurants (Meyers-Levy and Sternthal 1993), and multiple theories have been offered to explain the results.

Herr (1989; see also Herr 1986; Herr et al. 1983) proposes that whether assimilation or contrast of evaluations of a stimulus is found depends upon its "feature overlap" with a primed category (and thus whether or not it is viewed as representative of the category). For example, estimating the cost of a car in the presence of moderately more expensive cars would lead to an increase in the estimated price of the focal car because the focal car would be seen as belonging to the category. However, estimation of the cost of this same car would be reduced if the contextual cars were from an extremely high-priced group to which the focal car did not belong.

The related “inclusion/exclusion” model (Schwarz and Bless 1992; Wänke, Bless and Schwarz 1999) argues that categorization does not have to be driven by feature overlap of the stimuli as suggested by Herr. Although the nature of classification is a relatively small departure from the feature overlap model, the implications are rather important. Theoretically, the inclusion or exclusion of the stimuli into any category (i.e., same brand vs. different brand, upscale items vs. time-sensitive items, etc.) can lead to differences in the evaluations independently of similarity, which suggests that marketers have a great deal of opportunity to create consumer categories that give their products an advantage (Wänke et al.1999 a,b).

The set/reset hypothesis (Martin, Seta and Crelia 1990) proposed that whether a participant makes an evaluation of the target stimuli when the prime is “set” (i.e., still activated) or “reset” (i.e., has been suppressed or otherwise discounted) determines whether the stimulus will exhibit assimilation or contrast with the prime. Assimilation tends to occur if resetting has not occurred and contrast if it has. An implication of the hypothesis is that the resetting process occurs subsequently to the setting process, and thus should require more cognitive resources to occur (Martin et al. 1990). This suggests that conditions that make it more difficult to reset should lead to increase instances of assimilation, and the literature provides examples that support this prediction. Martin et al. (1990) found that when participants were exposed to a prime assimilation increased directly with cognitive load, increased inversely to willingness to expend effort, and increased inversely to need for cognition. While set/reset theory convincingly explains how contrast and assimilation can both be obtained from the same cues under different conditions, it doesn’t allow for feature overlap to affect the outcome. The hypothesis suggests that contrast will be the reset even when there is considerable overlap between the prime and the

stimulus because some degree of the true attribute level of the stimulus will be attributed to the prime making the two seem more dissimilar than they truly are.

Meyers-Levy and Sternthal (1993) propose a two-factor model that combines the feature overlap model and the set/reset model to more completely explain occurrences of contrast and assimilation. The two-factor theory argues that both feature overlap (Herr 1989) and cognitive effort (Martin et al. 1990) will affect whether contrast or assimilation is observed. When low amounts of cognitive effort are expended the less taxing assimilation process will occur regardless of feature overlap (as suggested by Martin et al. 1990). However, when the level of cognitive effort involved in the judgment is sufficiently high, the amount of feature overlap becomes important. Under high cognitive effort conditions, consumers will classify stimuli with high overlap with the primed category as part of that category, which leads to assimilation and stimuli with low overlap as not part of the category, which leads to contrast. Meyers-Levy and Sternthal's finding is important because it finds that the same primes can lead to different context effects based on cognitive effort (as suggested by Martin et al. 1990), but only if there is insufficient overlap (Herr 1989) for assimilation under scrutiny.

Summary of Single Product Context Effects

There is voluminous evidence for the existence of context effects in single product evaluations. Consumers are sensitive to a wide range of contextual effects including the distributions and range of attributes in a contextual set (Hutchinson 1983; Lynch, Chakravarti and Mitra 1991; Cooke and Mellers 1998; Parducci 1965), the tradeoffs between attributes within the set (Simonson and Tversky 1992), and whether an option is dominated by another alternative (Huber, Payne and Puto 1982). Consumer evaluations are also sensitive to the way a stimulus is categorized (Herr et al. 1983; Wänke et al. 1999 a,b) and the cognitive effort required by the judgment (Martin et al. 1990; Meyers-Levy and Sternthal 1993). Any investigation of how

context will affect bundle evaluations must be able to account for the influences of single product context and demonstrate that bundle context has new implications in order to have an important contribution to the literature. In order to evaluate how context may affect bundle evaluations, it is necessary to explore how the bundle judgment process differs from single product judgment and review the extant literature on bundle judgments, which I do in the following chapter.

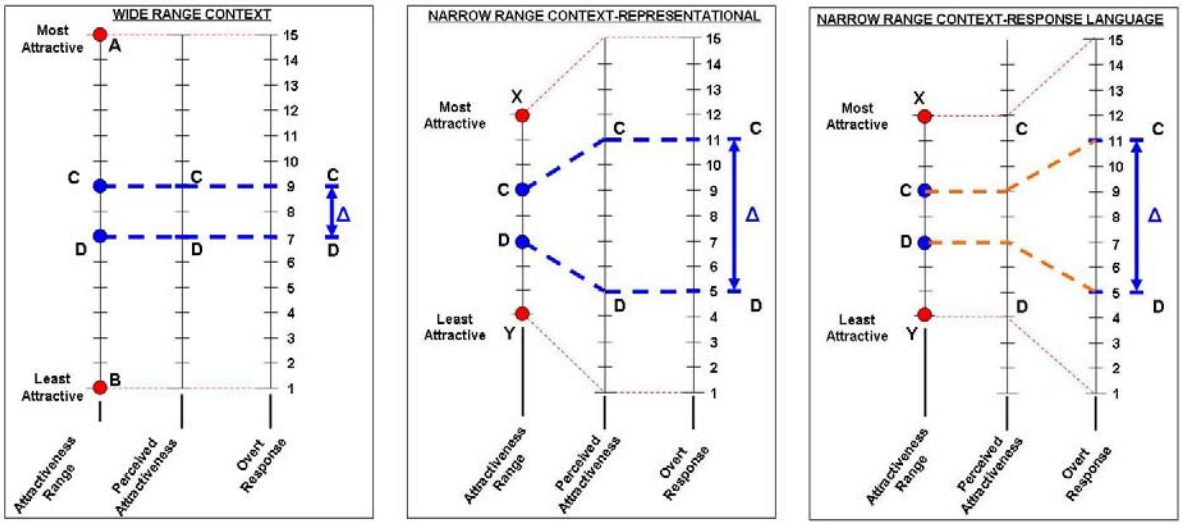


Figure 2-1. Representational vs. Scale Effects

CHAPTER 3
BUNDLE EVALUATION AND CONTEXTUAL EFFECTS

Given the volume of research on single product context, it is surprising that no research has investigated how the perception of bundles is influenced by context. My research contributes to the existing literature by investigating whether the process of bundle judgment is vulnerable to bundle context effects that are not explained by single product context. My dissertation is based on the premise that when consumers consider a product bundle, they evaluate it in part by comparing it to other available bundles. Before this can occur, consumers must create preliminary evaluations of the bundles themselves, and there is debate over how consumers integrate product evaluations into a bundle evaluation. The work discussed up to this point has been primarily focused on single product units, where consumers must simply integrate the scale values of each attribute seen *within* a product and weight them to arrive at an overall product evaluation. A bundle evaluation is necessarily more complex because a consumer must evaluate attribute level benefits not only within the product, but also within the bundle. This chapter will review literature that deals with the process of bundle evaluation and explore how context can affect consumers' evaluation of bundles.

Alternative-Based vs. Attribute-Based Processes

The extra complexity of bundle evaluations leads to the possibility of two different routes to evaluate attribute level changes in bundle evaluations, an alternative-based method and an attribute-based method. Figure 3-1 shows an outline of the alternative-based bundle judgment process proposed by Gaeth et al. (1990), which is based on IIT (Anderson 1981, 1982). In this proposed process, physical cues (φ_{a1}, φ_{a2}, φ_{b1}, φ_{b2}) are encoded and subjectively represented as scale values (s_{a1}, s_{a2}, s_{b1}, s_{b2}) through psychophysical functions (H). The scale values are then integrated into overall product impressions (Ψ_{a1b1}, Ψ_{a2b2}) through the integration function (C).

The process explained to this point is identical to the one described by IIT and has been used to describe how consumers evaluate single products in context (e.g., Chakravarti and Lynch 1983). Gaeth et al. (1990) expanded the framework to include the additional step of integrating the product evaluations into a bundle impression (β_{12}) through the bundle integration function (F) before reaching the response function (J).

The alternative-based process (Gaeth et al. 1990) suggests the impressions of two (or more) product evaluations are combined to form an overall bundle evaluation, but an attribute-based process (see Figure 3-2) is a possibility. In the attribute-based conceptualization, the physical cues, φ_{a1}, φ_{a2}, φ_{b1} and φ_{b2} (with subscript letters representing the attribute and subscript numbers representing the product) are transformed into the subjective level of each attribute found in each product (s_{a1}, s_{a2}, s_{b1} and s_{b2}) by the psychophysical function (H). These subjective attribute values are then combined across products with an attribute integration function (G) to arrive at an "attribute inventory", α, (McAlister 1982) for each attribute in the bundle. The different α values are then integrated into the internal bundle impression (β_{ab}) the function C, which is translated in turn to the overt response (R) by the strictly monotonic response function (J).

While the majority of past research has investigated bundles from the standpoint of the alternative-based model (e.g., Adams and Yellen 1976; Gaeth et al. 1990), there are examples of the attribute-based conceptualization being used (e.g., Lancaster 1966) in the literature. For bundle context to have effects beyond single product context, evaluations must be sensitive to attribute inventories at the bundle level. Otherwise, any effects that are obtained could be attributed to single product context. Sensitivity to the contextual information of how products are combined (i.e., bundle context) does not rule out either bundle judgment process by itself

because the addition of an additional source of context information does not specify the locus of the effect. For example, it is possible for bundle context to have representational effects in the psychophysical function (H) or either integration function (C or F) even if the process is alternative-based. Furthermore, a demonstration of a perceptual effect of bundle context would be much more interesting than a demonstration of a scaling effect.

Bundle Evaluation Literature

Neo-classical economic theory typically assumes that bundle evaluations are based on an additive combination of the constituent products (Adams and Yellen 1976). Economic theories can explain deviations from additivity if the bundle products are substitutable or complementary (Cooke, Pecheux and Chandon 2005; Hicks and Allen 1934a,b; Samuelson 1974). Products are considered complementary if the value of one product is greater in the presence of the other and substitutes if the value of one product is lessened in the presence of the other (Samuelson 1974). These relationships between products have important implications for bundle evaluations. Bundling complementary products leads to "superadditivity" where the value of a bundle is greater than the sum of its parts. Bundling substitutes leads to "subadditivity" where the value of a bundle is less than the sum of its parts.

These classic definitions are somewhat limiting in that they look at the value of the bundle in terms of the products as units. Lancaster (1966) described how utility is derived from the characteristics (i.e., attributes) contained by the goods (not the goods themselves per se) and how groups of products (i.e., bundles) may exhibit deviations from additive utility based upon the attribute levels found within the group of products forming the bundle as a whole.

Behavioral research has also shown support of the idea that bundle evaluations are not always an additive combination of the individual product evaluations. Gaeth et al. (1990) demonstrated that bundle quality evaluations are consistent with a process that averages the

evaluations of individual products which compose the bundle. The results showed that an equal weight averaging model (Anderson 1981) fit the data well despite the large variation in product values.

Yadav (1994) argued that bundle evaluation involved an anchoring and adjustment process where consumers anchor on the most important item in a bundle and adjust the bundle evaluation for the other items the bundle contains. The results of two experiments showed that evaluations of bundled stimuli were described well by a weighted averaging process, and consumers tended to examine the most important product first. Although two different bundles were used, contextual effects at the bundle level were not examined.

Hsee (1996) proposed that the "less is better" phenomenon resulted from differential ease of attribute evaluation. Attributes that were hard to evaluate in isolation received less weight in a separate evaluation than in a joint evaluation, where attribute levels were easily compared between options. Hsee (1998) used dinnerware sets to explore this effect with bundles. One set had intact contents with no broken pieces. Another set had all the pieces in the first set, plus additional broken and unbroken pieces. Subjects in the joint evaluation condition saw that the latter set was superior. In a separate condition, the first bundle was perceived more favorably due to the difficulty of valuing the number of unbroken pieces without a reference. List (2002) finds similar results in a field experiment using baseball card sets. In separate evaluations, participants used the information available to them to form a bundle evaluation by averaging good and marginal items with no subsequent adjustment for bundle context. In joint evaluations, original evaluations of the bundles were formed, and then adjusted with an easy comparison to the dominant option. These studies provide evidence that consumers will average product evaluations in isolation, but not necessarily when given an easy alternative evaluation.

Popkowski Leszczyc, Pracejus, and Shen (2007) argue that hyper-subadditivity, where the value of the entire bundle is less than the value of one of the constituent products, results from an inferential process based on differing levels of product uncertainty within a bundle. The authors argue that when a low-value, high-certainty item is paired with a low-certainty, high-value item, the low-value item is used a cue of low value, leading to hyper-subadditive bundle evaluations. When the certainty conditions are reversed between products, superadditive bundle evaluations are found. If both products in the bundle are equally certain in terms of value, the valuations follow an additive rule. The experimental results support the authors' predictions with a currency-based measure.

A common thread among the alternative explanations proposed by behavioral research and neo-classical economic theory exists. Each explanation can be described as a stimulus-based inferential process (Kardes, Posavac, and Cronley 2004). The neo-classical economic standpoint can be explained as an integration of two products with relatively little uncertainty, leading to an additive bundle combination (as proposed by Popkowski Leszczyc et al. 2007), one of the possible algebraic combination rules in information integration theory (Anderson 1981). Hsee's (1996, 1998) results can be explained by the inferences consumers make about the importance of specific attributes or products based upon differential "evaluability," as he argued. Lastly, the findings of both Gaeth et al. (1990) and Yadav (1994) regarding how consumers form bundle evaluations can be described well by an inferential process where consumers use an averaging rule, whether the weights are approximately equal (Gaeth et al. 1990) or weighted more heavily for the more important product (Yadav 1994). This makes the proposed IIT-based framework a reasonable choice because it can accommodate all of these processes and allow us to investigate the influences that context will have in the evaluation of bundles.

Summary

There is some evidence that consumers' evaluation of a bundle is affected by attribute level contextual manipulations of the surrounding set (e.g., Cooke et al. 2007). There is also evidence that manipulating the ease of evaluation of attributes in a bundle may lead to preference reversals between bundles for joint and separate presentation (e.g., Hsee 1998; List 2002). However, no studies of which I am aware explicitly investigate how the presence of other bundles can systematically affect evaluations of the target bundles in a manner that cannot be explained by single product context. In the following chapters my dissertation will investigate the influences of context on bundle evaluations and the processes consumers use to evaluate bundles with a series of four experimental studies.

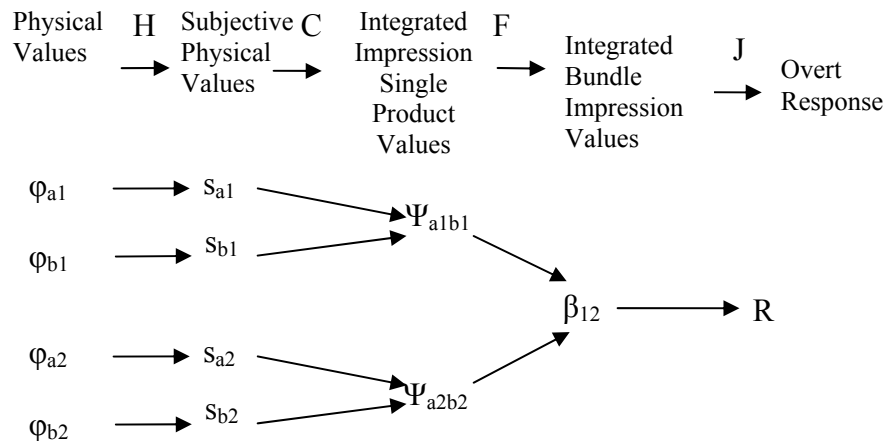


Figure 3-1. The Bundle Alternative-Based Judgment Process

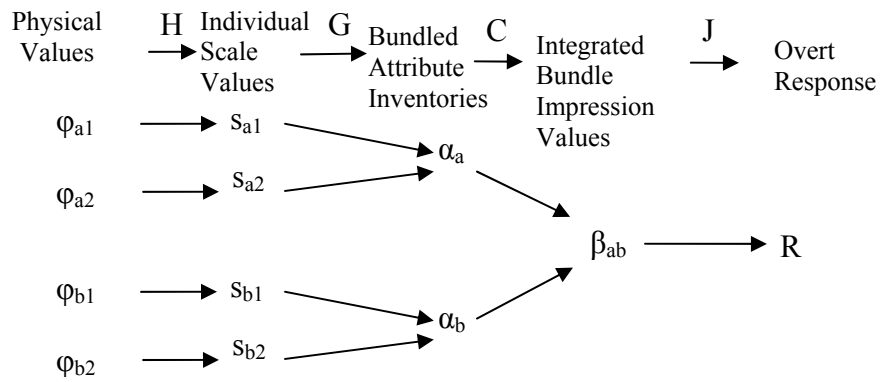


Figure 3-2. The Attribute-Based Bundle Judgment Process

CHAPTER 4
EXPERIMENT 1

Motivation and Hypotheses

The primary goal of Experiment 1 was to demonstrate that consumers are sensitive to bundle context when the set of contextual products remains constant. The experiment also explored whether consumers utilize a combination rule that is consistent with an additive or averaging-based process when processing bundle context. I selected common products with differential appeal to college students so as to produce a design similar to that of Figure 4-1. Common consumer bundles typically involve complementary products (e.g., computer and printer). It could be argued that complementary products create heightened opportunity for bundle context effects by creating more extreme variations in bundle context due to superadditive and subadditive contextual bundles. In order to provide a stronger test of my hypotheses, I selected products that participants would view as relatively independent of one another, which should if anything strengthen single product context and weaken the perception of the bundle context.

Figure 4-1 illustrates the design used in Experiment 1 schematically. Consider eight different products arranged in order of attractiveness. I will focus on the four products labeled A, B, C, and D, in the middle of this scale. In addition to these target products, I include two relatively attractive contextual products labeled W and X and two relatively unattractive products labeled Y and Z. I manipulate bundle context by changing the way the two pairs of contextual products are bundled.

Suppose that all of the products in the set are rated on a scale from 8 (most attractive) down to 1 (least attractive). In the wide context condition, the two most attractive products (W and X) with individual ratings of 8 and 7 are bundled together, as are the two least attractive

products (Y and Z) with individual ratings of 2 and 1, creating a wide range of overall attractiveness in the bundle set. The four remaining products (A, B, C, and D) have moderate individual attractiveness ratings (3, 4, 5, 6) and create the target bundles ({A, B} and {C, D}) that I want to assess. Assuming an averaging process, the overall contextual bundle evaluations range from 1.5 to 7.5. In the narrow condition, products W and Z are bundled together as are products X and Y, creating a narrow range of overall attractiveness in the bundle set. The overall evaluations of both contextual bundles would be 4.5 and fall between the evaluations of the two target bundles.

What do different accounts of bundle context imply? Studies of single product context effects show that evaluations of target stimuli are sensitive to the range (Hutchinson 1983; Lynch, Chakravarti and Mitra 1991) and frequency distributions (Cooke and Mellers 1998) of contextual stimuli, and I argue that the same is true for bundle context. First, suppose the distribution of overall bundle evaluations affects bundle attractiveness. In the wide condition, the two target bundles will seem more similar to one another than in the narrow condition. I should find that the difference between the two target bundles will be greater in the narrow condition than in the wide condition. Alternatively, suppose that single-product context, but not bundle context influences product evaluations. In this case, adding or removing contextual products might alter judgments of individual products as well as bundle evaluations, but since the contextual products are the same in each condition, there should be no change in the evaluations of the bundles across conditions. Hence, sensitivity to bundle context predicts that the target bundles should appear more similar in the wide context than in the narrow context, whereas sensitivity to only single-product context predicts no differences, as does a complete insensitivity to context.

- **H1:** The difference in attractiveness between two constant target bundles will appear greater in a "narrow" bundle context than in a "wide" bundle context.

Note that if consumers are sensitive to bundle context, H1 should hold regardless of whether bundle evaluations are based on adding or averaging. Furthermore, my proposed framework and Hypothesis 1 allow for any bundle integration process to drive these effects. Although my first study is not designed to test different bundle integration rules per se, I will investigate some rules that consumers may be using. Later studies will explore this issue more deeply, and demonstrate the relationship between bundle context and bundle integration. Based on past research (Gaeth et al. 1990; Hsee 1998; Yadav 1994), I expect that consumers will process bundle context in a manner that is inconsistent with an additive combination rule. Processes that are consistent with an averaging model predict that the evaluation of a bundle should be significantly less than the evaluation of its most attractive constituent product. This leads to my next hypothesis.

- **H2:** The evaluations of bundled contextual stimuli will be significantly lower than the evaluations of the most attractive single product in that bundle.

Method

Participants and design. 185 students participated in this experiment in exchange for extra credit. The design was a two (bundle context: narrow vs. wide) × two (order: first vs. second) × two (target attractiveness: high vs. low) mixed design with a control condition. Bundle context and order were between-subjects factors, and target was a within-subjects factor.

Stimuli. The stimuli consisted of the eight individual products and descriptions listed in order of decreasing attractiveness in Table 4-1. The high target bundle consisted of an elegant dinner for two and a Canon printer. The low target bundle consisted of an American Eagle T-shirt and 2 DVDs. Bundle context was manipulated by changing the composition of the context

bundles. In the narrow condition, context bundles consisted of an MP3 player and Post-it notes as one bundle, and a DVD player and a 2 liter bottle of soda as the other. In the wide condition, the MP3 player and the DVD player were bundled, and the soda and Post-it notes were bundled. I manipulated the presentation order of the contextual bundles between order conditions. No order effects were found, and the factor will not be discussed further. The control condition contained the target bundles and the four contextual stimuli all presented as individual products.

Procedure. The study was computer-based, and subjects were randomly assigned to one of the five experimental conditions. As a cover story, participants were told that they would be evaluating prizes for a survey in which other students had participated.[1] Participants were asked to pay attention to the different packages that were shown to them. After viewing all of the bundles simultaneously for 20 seconds, subjects were given a scenario where two students had won prize packages. (One had won the high target bundle, and one had won the low target bundle.) Participants indicated how attractive they thought the available prize packages would be to a typical student on a 15 point scale. This was the primary dependent variable. Target bundles were always evaluated last to ensure that the contextual stimuli were processed. They were then asked to rate the predicted attractiveness of each individual product using a 21 point scale to a typical student.

Results

Manipulation check. Recall that my design (Figure 4-1) requires that the high target bundle 1 be judged more attractive than the low target bundle. A two-way repeated-measures ANOVA revealed a main effect of target attractiveness ($F(1,180) = 266$, $p < .001$) on bundle attractiveness. Participants found the high target bundle to be more attractive than the low target

[1] I adopted this "second-person" cover story in order to avoid heterogeneity associated with participants' idiosyncratic experiences with the products.

bundle across the five conditions (M_{high} = 12.09 vs. M_{low} = 8.75). These results confirm that my manipulation of target bundle attractiveness was successful.

Does bundle context affect evaluations: Because a bundle context × order × target attractiveness repeated-measures ANOVA revealed no significant main effect or interactions involving order (p's > .7), I collapsed the data across order and ran a second analysis. The results of this second ANOVA showed a main effect of target attractiveness ($F(1,146) = 240$, $p < .001$), which was qualified by an interaction with bundle context ($F(1,146) = 12.96$, $p < .001$). Consistent with Hypothesis 1, the mean difference in perceived attractiveness between target bundles was greater in the narrow context than in the wide ($\Delta_{Narrow} = 4.41$ vs. $\Delta_{Wide} = 2.74$). Planned contrasts showed a significant difference between narrow and wide bundle context conditions ($t(146) = 3.46$, $p = .001$) for low target bundle evaluations but not for high target bundle evaluations ($t(146) = .376$, $p > .5$).

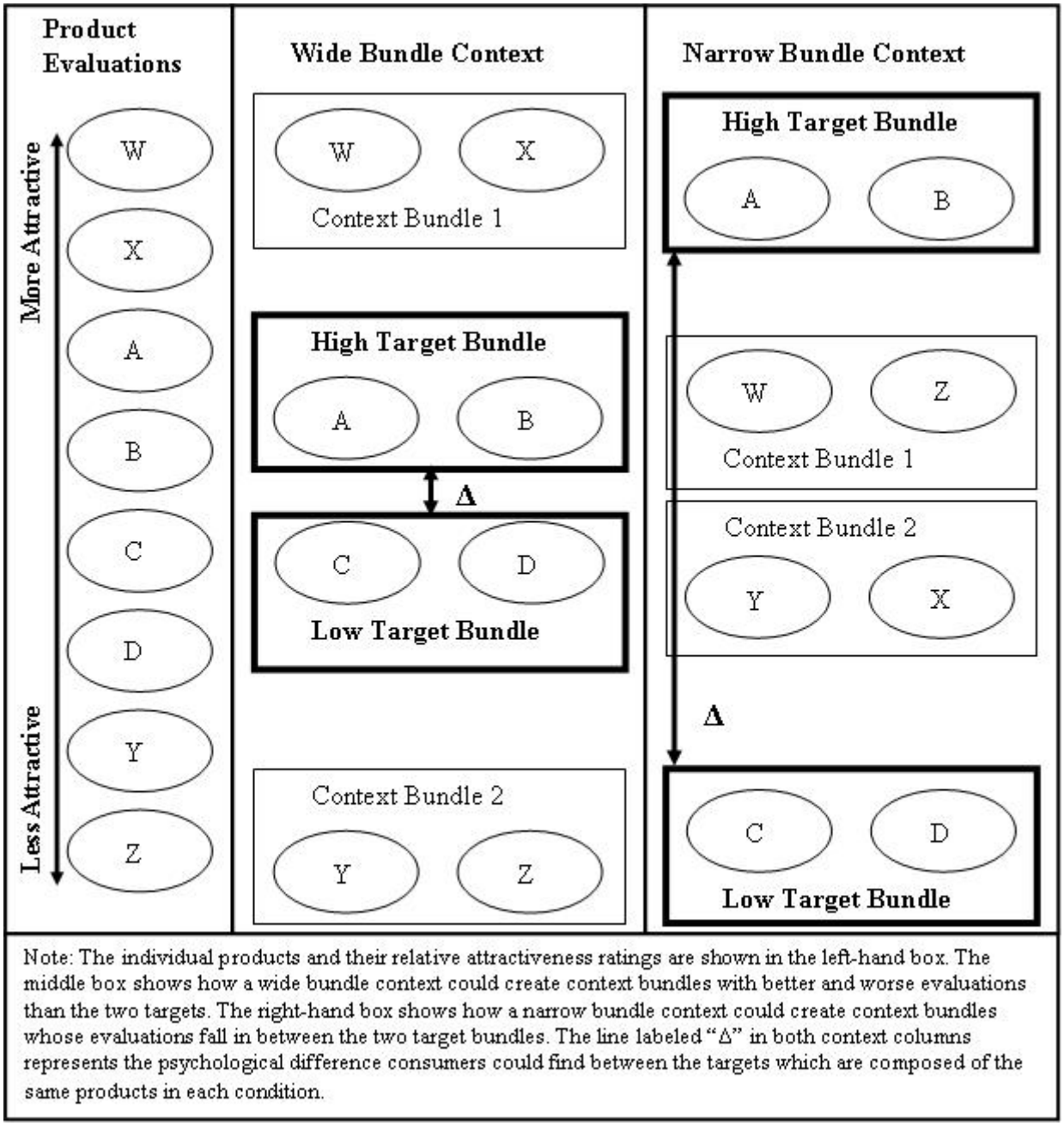
Do consumers add or average products: I ran two mixed ANOVAs to investigate whether bundle evaluations were additive combinations of the products or averages. The ratings of the more attractive item in a contextual bundle (based on results in the control condition) were compared to the ratings of the bundle in which it was contained. For want of a better term, I refer to this factor as "task." In the narrow context, the context bundle by task analysis revealed a main effect of task ($F(1,109) = 7.88$, $p < .05$) and no significant interaction with task. Consistent with Hypothesis 2, participants found the preferred product ($M = 12.34$) to be more attractive than the bundle in which this product was contained ($M = 10.98$). In the wide context, a significant task by context bundle interaction ($F(1,109) = 6.23$, $p < .05$) was found. Planned contrasts showed that the attractiveness of the single product was higher than the bundle in the low context bundle (Ms = 4.32 and 2.69, respectively; $t(58) = 3.12$, $p < .01$) supporting

Hypothesis 2, but the scores were not significantly different for the high context bundle (*M*s = 13.32 and 13.36; $t(109) = .09$).

Discussion

The results of Experiment 1 provide evidence that bundle context influences the way consumers perceive contextual stimuli even when single product context is held constant. Target bundles appeared more similar in the wide context, where contextual bundles had widely disparate overall evaluations, than in the narrow context, where contextual bundles were more similar in overall evaluation. If consumers were only sensitive to single product context or were insensitive to context effects, the evaluations of the target bundles would have been constant across all conditions.

The results also revealed that bundle attractiveness was significantly less than the most attractive product it contained in all but the wide context, high context bundle comparison. This might be due to a ceiling effect of the two best products combined together in one bundle. This pattern of results is inconsistent with an additive model, even one allowing for extreme subadditivity. However, it is consistent with a process yielding an averaged bundle evaluation.



Note: The individual products and their relative attractiveness ratings are shown in the left-hand box. The middle box shows how a wide bundle context could create context bundles with better and worse evaluations than the two targets. The right-hand box shows how a narrow bundle context could create context bundles whose evaluations fall in between the two target bundles. The line labeled "Δ" in both context columns represents the psychological difference consumers could find between the targets which are composed of the same products in each condition.

Figure 4-1. Wide and Narrow Bundle Context with the Same Single Product Context

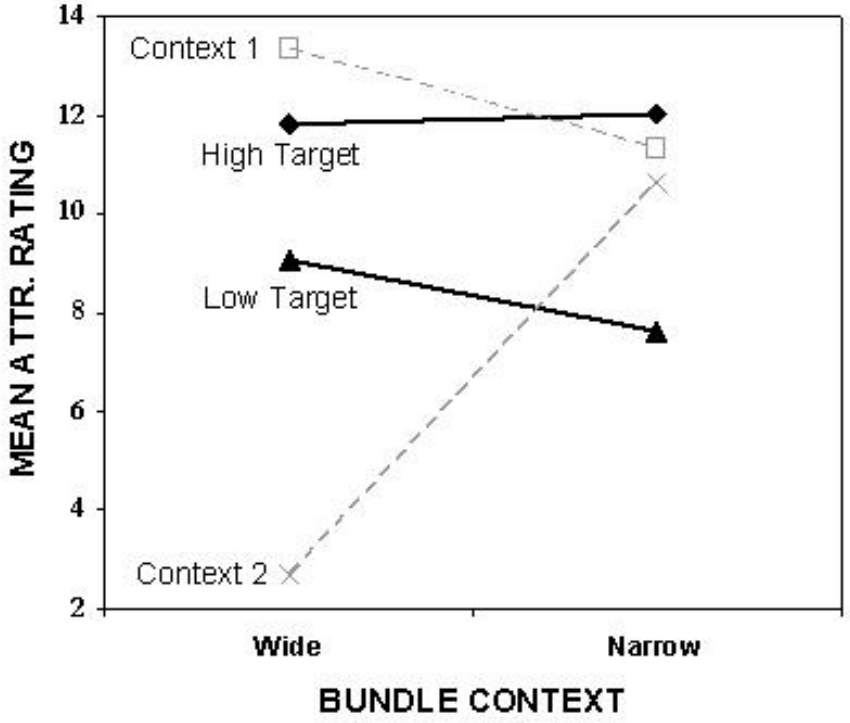


Figure 4-2. Attractiveness by Bundle Context

Table 4-1. Experiment 1 Stimuli

Preference Rank	Item	Description
1	SanDisk - e250R 2GB MP3 Player	Thin, powerful and just 2.7 oz. w/ color display
2	Zenith 7" Portable DVD Player	16:9 aspect ratio w/ Dolby Digital & DTS decoders
3	Elegant Dinner for 2	Includes entrées, appetizers and desserts at either the Sovereign or Stonewood Grill
4	Canon Deskjet Printer D4160	Print crisp documents and photos quickly and easily from your home computer.
5	2 DVDs of your choice	Receive 2 DVDs of your choice at BestBuy. 100s to choose from.
6	American Eagle Longsleeve Tshirt	Cool and comfy cotton/poly T features screenprinted graphics on the front.
7	2 Liter Bottle of Soda	Two liter bottle of the soft drink of your choice from Publix
8	Pack of Post-it Notes	2 convenient Post-it Notepads in your choice of Colors

CHAPTER 5
EXPERIMENT 2

Motivation and Hypotheses

Experiment 1 demonstrated that consumers are sensitive to bundle context. Although I have argued that manipulation of the bundle context will lead to differences in the perceived attractiveness of the target bundles, the design of Experiment 1 does not allow us to rule out response language effects as an alternative explanation. Furthermore, the bundles presented in the first study do not provide situations where the products within the bundles can be evaluated along common attributes. In Experiment 2, I manipulate the bundle context over a product set having alignable attributes to further explore the sensitivity of bundle context and answer questions about the locus of the effect.

Lynch et al. (1991) determined whether context effects in multiattribute stimuli stemmed from changing mental representations of the stimuli by evaluating the attractiveness ratings of stimuli across contexts. A disordinal interaction in the mean attractiveness ratings could not be explained by a change in how consumers where anchoring the rating scale (response language effects), but an ordinal interaction could be caused by either response language or representational changes. In Experiment 1, I measured the mean attractiveness difference between two target bundles that were designed to be more or less attractive relative to the other across contexts. The context manipulation increased or decreased this difference, but it was not designed to reverse mean attractiveness scores. Thus, the ordinal interaction found in Experiment 1 cannot rule out response language as a driver of the bundle context effects.

In order to demonstrate that bundle context has influence beyond that which can be attributed to single product context and response language, I must show a “representational” change in bundles (Chakravarti and Lynch 1983; Lynch et al. 1991) occurs between bundle

contexts. One way to accomplish this task is to create a choice reversal between bundle contexts, which cannot be explained by any monotonic adjustment of a rating scale. To produce reversals in a predictable direction, the stimuli must be manipulated at the attribute level and have the following characteristics. First, the bundled products have to be evaluable on common attributes. Second, the aggregated values of these attributes have to be meaningful at the bundle level and be of approximately equal importance. If one attribute is more important, the bundle with the advantage on that attribute will have the advantage in any context. Last, the evaluability of the attributes must be relatively low so that both are affected by contextual manipulations (Yeung and Soman 2005). If these conditions are met, it should be possible to reverse bundle preferences by manipulating two attributes independently to create different ranges along each (e.g., Mellers and Cooke 1994).

Consider the situation in Figure 5-1. Products vary in price and quality. The single colored boxes represent individual products (black boxes represent TVs and white boxes represent DVD players), and the dual-colored boxes represent TV / DVD player bundles. The individual contextual products in the top panel can be bundled either vertically (Condition 1) or horizontally (Condition 2). In Condition 1, the context bundles create a relatively narrow price range, and a relatively wide quality range. In Condition 2, the context bundles create a relatively wide price range, and a relatively narrow quality range. Although the differences in price and quality (denoted by ΔP and ΔQ in the figure) are constant, range theory predicts that the perceived price difference (denoted by $\Delta P'$ in the figure) should be relatively larger in Condition 1 than Condition 2, and that the perceived quality difference (denoted by $\Delta Q'$ in the figure) should be relatively larger in Condition 2 than Condition 1.

When making choices between target bundles C and D, consumers must make tradeoffs between the attribute levels found in each, which remain objectively constant. However, when deciding between options in Condition 1, consumers should perceive giving up relatively little quality advantage to receive a relatively large advantage in price, and in Condition 2, they should perceive giving up a relatively small price advantage to get a relatively large quality advantage. This pattern should lead to bundle C being relatively more preferred than bundle D in Condition 1, and relatively less preferred in Condition 2. This leads to my third hypothesis.

- **H3:** A bundle that is superior on a narrow-range attribute will be preferred to a bundle which is superior on a wide-range attribute.

Method

Participants and Design. One hundred and nineteen students participated in the study in exchange for extra credit. Twenty-three participants were eliminated for failing to pass attention checks, leaving 96 participants for analysis. The design was a two (bundle context: wide quality range / narrow price range vs. narrow quality range / wide price range) by two (target: 1 vs. 2) mixed design where target was the within-subjects factor. Product order, attribute order, and target order were counterbalanced.

Stimuli. The stimuli for Experiment 2 consisted of the six TVs and six DVD players bundled as shown in Table 5-1. Each bundle contained one DVD player and one TV. The target bundles consisted of products which rated moderately on quality and price attributes. One target bundle had a price advantage, and the other had a quality advantage. Bundle context was manipulated by changing the pairings of the contextual products to create either a wide price range and a narrow quality range or a narrow price range and a wide quality range.

Procedure. The study was computer-based, and subjects were randomly assigned to one of the 2 experimental conditions. As a cover story, participants were told that they would be

evaluating package offers that were available from an online retailer for a friend who was in the market for a TV and DVD player. After evaluating the attractiveness of each bundle, participants were asked to indicate the overall price and quality of the bundle to make the attribute levels salient. After completing the responses for all of the bundles, participants were asked to make three choices between bundles. The first two choices were made between contextual bundles to highlight the overall attribute ranges. The third choice between the target bundles was the primary dependent variable. Participants were then asked to respond to a series of questions about unrelated products, were debriefed and dismissed.

Results

Does bundle context affect choice between bundles: Results of a chi-square analysis revealed a significant choice reversal. Participants were more likely to choose the higher quality bundle (68% of respondents) in the narrow quality context and more likely to choose the lower price bundle (59%) in the narrow price range context ($\chi^2(1) = 7.185$, $p = .007$). See Figure 5-2.

Discussion

The results of Experiment 2 support Hypothesis 3 and provide evidence that manipulating the range of attributes within a bundle set can affect target bundle choice in a manner that cannot be explained by single product context or response language. When bundled products are alignable, consumers are sensitive to the aggregated levels of dimensions within the bundles in the contextual set even when the individual products are held constant. From a theoretical standpoint, these results are important because they show that bundle context effects are a representational phenomenon that cannot be explained away by response language effects and that consumers are sensitive to the aggregated attribute levels of a bundle. From a managerial perspective, the findings are important because they show that it is possible to create choice reversals between bundles simply by rearranging the products surrounding those bundles without

adding new products to the set.

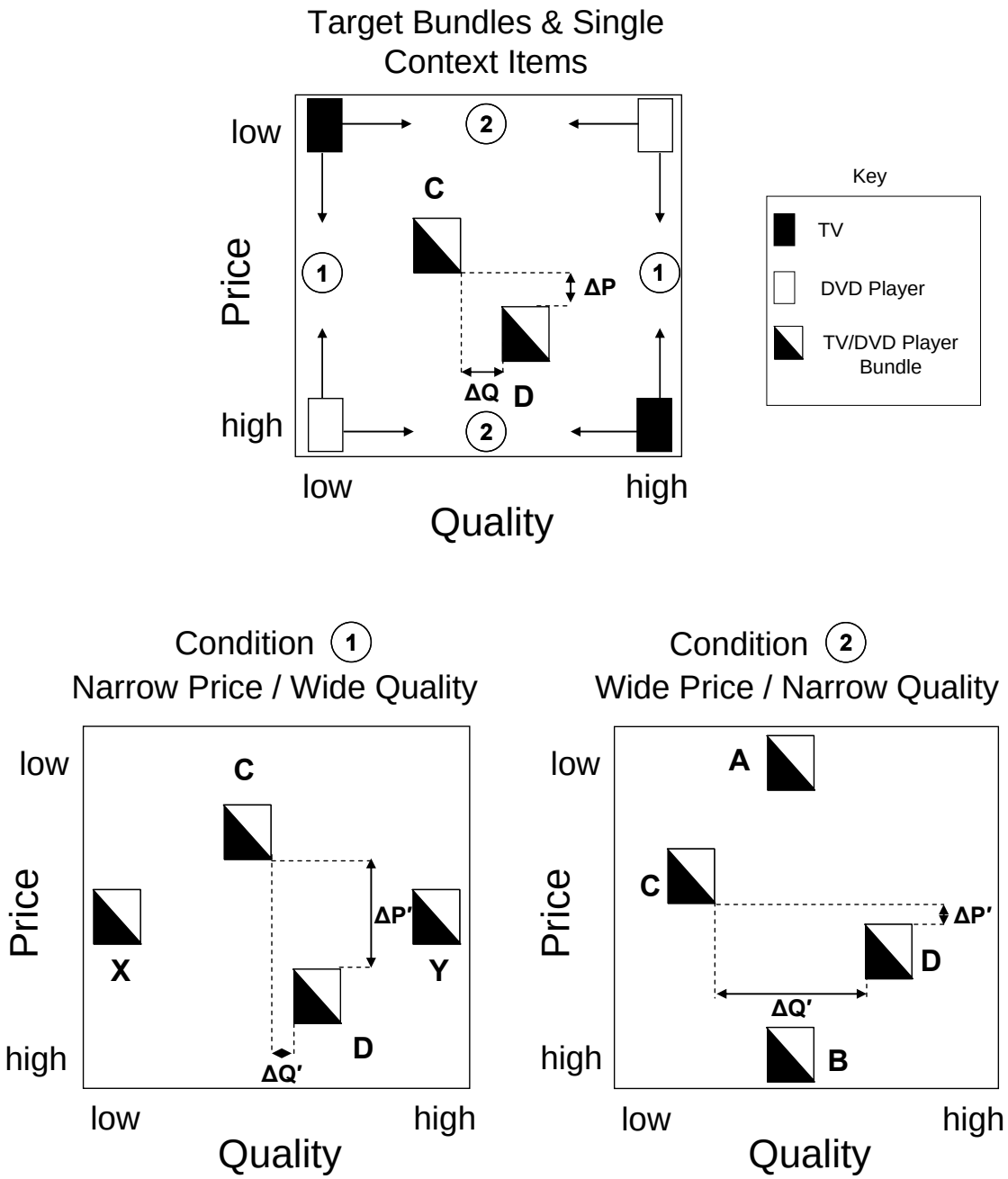


Figure 5-1. Attribute Level Manipulations of Bundle Context with Same Products

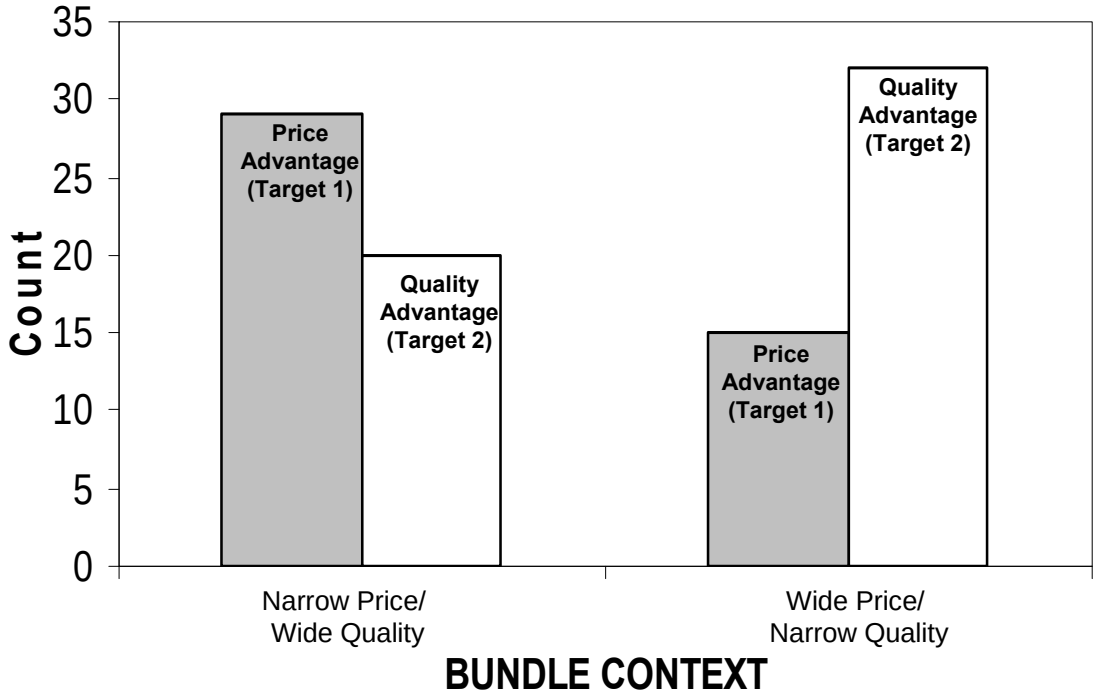


Figure 5-2. Choice by Bundle Context

Table 5-1. Experiment 2 Stimuli

Bundle	Product 1	Quality Rating 1	Price 1	Product 2	Quality Rating 2	Price 2
			Wide Quality / Narrow Price Condition			
Context 1	DVD 1	9.5 Stars	$110	TV 1	9.5 Stars	$380
Context 2	DVD 2	9.5 Stars	$110	TV 2	9.5 Stars	$380
Context 3	DVD 5	5.5 Stars	$190	TV 5	5.5 Stars	$220
Context 4	DVD 6	5.5 Stars	$190	TV 6	5.5 Stars	$220
Target 1	DVD 3	7.0 Stars	$140	TV 3	7.0 Stars	$280
Target 2	DVD 4	8.0 Stars	$160	TV 4	8.0 Stars	$320
			Narrow Quality / Wide Price Condition			
Context 1	DVD 1	9.5 Stars	$110	TV 5	5.5 Stars	$220
Context 2	DVD 2	9.5 Stars	$110	TV 6	5.5 Stars	$220
Context 3	DVD 5	5.5 Stars	$190	TV 2	9.5 Stars	$380
Context 4	DVD 6	5.5 Stars	$190	TV 1	9.5 Stars	$380
Target 1	DVD 3	7.0 Stars	$140	TV 3	7.0 Stars	$280
Target 2	DVD 4	8.0 Stars	$160	TV 4	8.0 Stars	$320

CHAPTER 6
EXPERIMENT 3

Motivation and Hypotheses

Experiments 1 and 2 demonstrated the existence of bundle context effects that influence evaluations in a manner that cannot be explained by single product context or response language effects. Experiment 3 builds on these findings and investigates how consumers process this extra compositional information. Dual-process theories claim that consumers have two processes by which to interpret information (Chaiken and Trope 1999; Schneider and Shiffrin 1977). The first is an automatic process of which consumers are largely unaware, and the second is a more effortful, conscious process (Kahneman and Frederick 2002). Research on context effects in social psychology has demonstrated that the process of accounting for contextual information can be an automatic process (Wittenbrink, Judd, and Park 2001). Yet, when consumers are evaluating options and forming preferences, they often use a more deliberate process involving comparisons (Bettman, Luce, and Payne 1998), which indicates effortful processing. Experiment 3 explores whether the effects of bundle context are the result of an effortful or automatic process by manipulating cognitive load.

The idea of context effects being moderated by cognitive load has found support in previous research (Martin, Seta and Crelia 1990; Meyers-Levy & Tybout 1997). This idea is consistent with Kardes, Posavac and Cronley (2004) who argue that "effortful inference formation is disrupted by cognitive load" (p.232) and with research in social psychology which has similarly argued that cognitive load can inhibit subsequent processes (Gilbert 2002). The process outlined in Figure 1 proposes that forming an overall bundle evaluation occurs subsequent to the evaluation of single products. Because bundle evaluation involves this additional step, I expect that considering contextual bundles in addition to the target should be

more difficult. Therefore, adding a cognitive load should decrease consumers' sensitivity to bundle context relative to a no-load condition.

However, the effortful nature of the process is not a foregone conclusion, and three potential outcome patterns exist for processing bundle context under load. First, if bundle context effects are not due to effortful comparisons, cognitive load should have no effect, and responses should not differ across load conditions. Second, if load prevents participants from forming overall bundle evaluations and they rely solely on (the constant) single product context (or simply ignore all context due to the load), responses should not differ across bundle context conditions. Third, if consumers use the most attractive product in the bundle as an anchor, as proposed by Yadav (1994), cognitive load should prevent them from fully adjusting their bundle evaluations for the less attractive product. Hence, under cognitive load, participants should perceive one contextual bundle above and one below the targets in the wide condition, but two bundles that are more attractive than the targets in the narrow condition. This predicts a decrease in the attractiveness of both targets in the narrow versus the wide context under load (see Figure 6-1). I predict that participants will evaluate the bundles in a manner consistent with Yadav's (1994) findings, and this leads to my next hypotheses.

- **H4a:** Bundle context effects will be moderated by cognitive load.
- **H4b:** Target bundle evaluations for participants under load will be less attractive in the narrow versus the wide bundle context.

Furthermore, if consumers anchor on the more attractive product during bundle evaluation, I expect that they will form stronger memories of this product than of the less attractive due to a greater depth of processing of that product (Craik and Lockhart 1972). If the bundle evaluation process is an effortful one, the reliance on the more attractive product should become greater under load as consumers try to extract bundle context information, but are unable

to fully process and account for the less attractive product. This should lead to a greater difference in depth of processing and strength of memory. This leads to my next hypotheses.

- **H5a:** Recognition of the more attractive product in a bundle will be greater than recognition of the less attractive product.
- **H5b:** Load will have a greater effect on the recognition of the less preferred than on the more preferred product in a bundle.

Method

Participants and design. One-hundred and nine students participated in this experiment in exchange for extra credit. Eighteen participants were eliminated for failure to follow directions or failing attention checks leaving 91 viable participants. The design was a two (bundle context: narrow or wide) × two (load: high or low) × two (target attractiveness: high or low) mixed design where bundle context and load were between-subjects factors and target attractiveness was a within-subjects factor.

Stimuli. The stimuli for Experiment 3 consisted of the same eight products used in Experiment 1. Bundle context manipulations for narrow and wide conditions were identical to the corresponding conditions in Experiment 1.

Procedure. The study was computer-based, and subjects were randomly assigned to one of the four experimental conditions. Cognitive load was manipulated by asking participants in the high load condition to study a list of eleven numbers and telling them they would have to remember these numbers and reproduce the list later in the experiment. Low load condition participants were not shown the list. High load participants were also shown a timer giving them time remaining in the task to increase load. The only other procedural changes from Experiment 1 were that subjects in the high load condition were asked to enter the remembered numbers before the covariate questions, and all subjects were asked to indicate which products they had

seen before in a recognition task performed before the covariate questions.

Results

Manipulation check. A three-way repeated-measures ANOVA revealed a main effect of target attractiveness ($F(1,87) = 61.74$, $p < .001$) on bundle attractiveness. Participants found the high target bundle to be more attractive than the low target bundle across conditions (M_{high}= 12.05 vs. $M_{low} = 9.41$) and confirmed that my manipulation of attractiveness of target bundles was successful.

Does cognitive load moderate bundle context effects: A three-way ANCOVA revealed a significant bundle context by load by target attractiveness interaction ($F(1, 84) = 4.22$, $p = .043$), supporting Hypothesis 4a and indicating that cognitive load moderated the participants' sensitivity to bundle context. A two-way ANCOVA revealed a bundle context by target attractiveness interaction replicating the findings of Experiment 1 ($F(1, 43) = 4.26$, $p = .045$) for the low load conditions. A two-way ANCOVA for the high load conditions revealed a main effect of bundle context ($F(1, 38) = 15.77$, $p < .001$, see Figure 6-2), but no significant bundle context by target attractiveness interaction. Participants found target bundles less attractive in the narrow versus the wide bundle context under high load in support of Hypothesis 4b.

Do consumers fail to fully process the less attractive item in a bundle when under load: To test Hypothesis 5, I compared correct and incorrect recognition responses across loads for two product groups that varied on attractiveness with three-way log-linear analysis (see Table 6-1). The first test paired the most attractive contextual item (MP3 player) and the least attractive contextual item (pack of post-it notes). In all contexts, the MP3 player was the most attractive product in the bundle in which it was contained, and the pack post-it notes was the least attractive product in the bundle in which it was contained. The results of this analysis revealed a main effect of attractiveness on recognition ($G^2(4) = 16.66$, $p < .0001$), which showed that

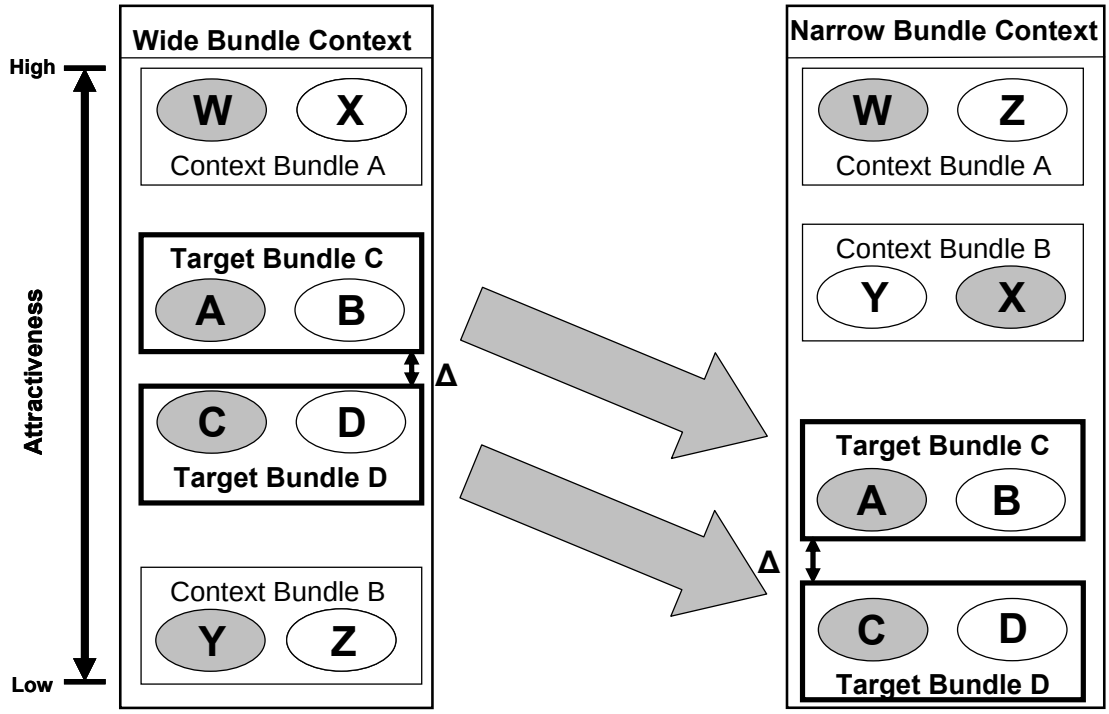
recognition was significantly better for the more attractive product across load conditions, consistent with Hypothesis 5a. The results also showed that attractiveness of the product moderates the effect that load has upon recognition ($G^2(4) = 25.34$, $p < .0001$), in a manner consistent with Hypothesis 5b. The second test combined the two contextual products whose attractiveness relative to the other product in the bundle changed based upon context. The portable DVD player was the more attractive product in the bundle in the narrow context, but the less attractive product in the wide context. The reverse was true of the soda. Thus, I compared the aggregated recognition of the DVD player in the narrow context and the soda in the wide context (for the high attractiveness) to the aggregated recognition of the DVD player in the wide and soda in the narrow (for low attractiveness). The results of the second analysis showed that attractiveness influences recognition ($G^2(4) = 4.48$, $p = .034$). There was a marginally significant effect of the interaction of attractiveness and load on recognition ($G^2(4) = 8.22$, $p < .084$), providing partial support for Hypothesis 5b.

Discussion

The results of Experiment 3 indicate that bundle context effects are due to effortful contextual comparisons between bundles in the set, supporting Hypothesis 4a. The main effect of bundle context in the high load conditions supports Hypothesis 4b. Participants found the bundle context information useful and tried to extract the information, but they were influenced more by the more attractive product in the bundle when under load.

The recognition analyses provide evidence that the attractiveness of the product influences recognition of the product, supporting Hypothesis 5a. The analyses also show that the effect of attractiveness on recognition is greater under load, consistent with Hypothesis 5b. I interpret these results as an indication that the more attractive products were processed more deeply, creating better memory for those products (Craik and Lockhart 1972). This is consistent

with consumers anchoring on the more attractive product and adjusting for the less attractive products in bundle evaluations (Yadav 1994).



Note: If consumers process bundle context with anchoring and adjustment (Yadav 1994), moving from wide to narrow should lead to a decrease in target evaluations due to incomplete processing of the less attractive products. Above, the more attractive products in each bundle are shaded. In the wide bundle context, there are still contextual stimuli above and below the targets on the attractiveness scale. In the narrow context, the increased focus on the more attractive components leads to the perception of only having contextual stimuli that have superior attractiveness to the targets.

Figure 6-1. Wide vs. Narrow Bundle Context Under Load

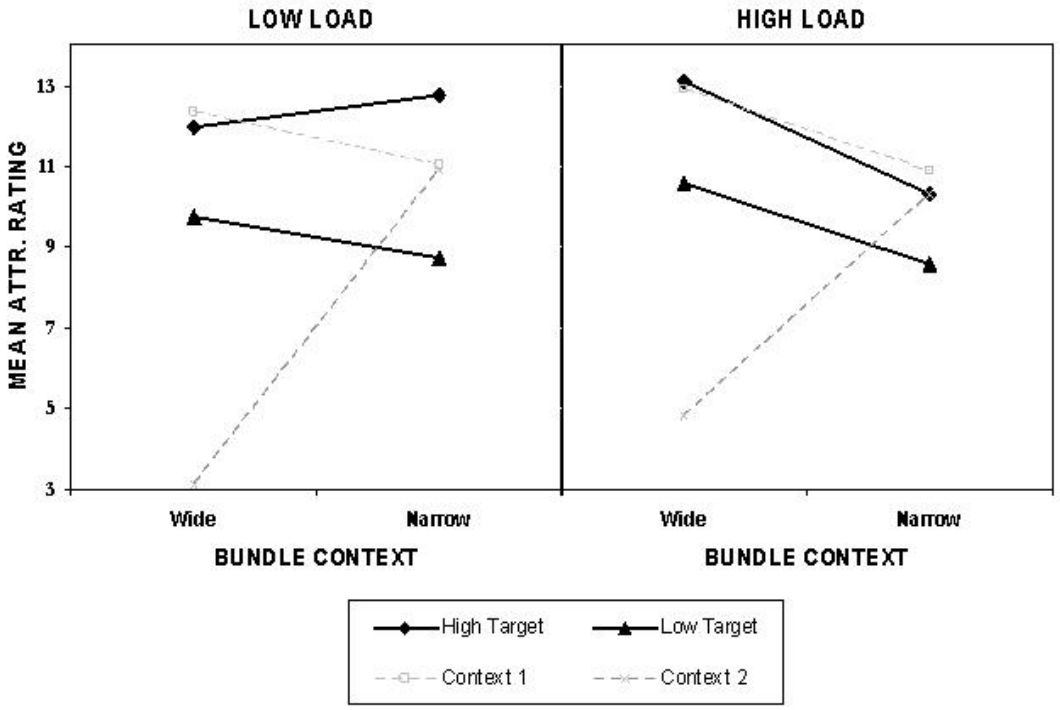


Figure 6-2. Attractiveness by Bundle Context by Cognitive Load

Table 6-1. Recognition Accuracy

		Cognitive Load					
		Low			High		
Comparison Products	Relative Attractiveness	Hit	Miss	%Correct	Hit	Miss	% Correct
MP3 Player / Post-it notes	High	46	2	96	41	2	95
	Low	42	6	88	29	14	67
DVD Player / Soda	High	46	2	96	39	4	91
	Low	43	5	90	33	10	77

CHAPTER 7
EXPERIMENT 4

Motivation and Hypotheses

The results of Experiment 3 demonstrate that available cognitive resources moderate the influence of bundle context. When consumers have a high cognitive load, they cannot fully process all of the information about the contextual bundles, and they attempt to simplify by relying more on the more attractive product in each bundle. But suppose that consumers typically have sufficient cognitive resources. Are other factors likely to induce them to take similar mental shortcuts? In particular, if offered a convenient heuristic, will they choose to use it, even though it does not fully account for bundle context?

Feldman and Lynch (1988) have shown that consumers often operate as cognitive misers, choosing to eliminate taxing cognitive processes through the use of heuristics (Bettman, Luce and Payne 1998). This suggests that consumers making effortful comparisons between bundles might be prone to heuristic use even when they have ample resources to process the information. For instance, when evaluating single products in the context of bundles, will consumers focus on the most attractive products in the bundles?

Experiment 4 investigated whether consumers would use a convenient heuristic to evaluate bundled context even with unconstrained resources. I did this by manipulating whether participants had to compare bundles to each other or bundles to single products. Previous research (e.g., Hsee 1996; Nowlis and Simonson 1997) has demonstrated that the easier information is to compare, the more impact it will have on evaluations. I assume that it is more difficult for consumers to compare a bundle to a single product than it is for them to compare two single products. Thus, one simplifying heuristic that consumers may use to compare bundles to single products is to compare the best product in the bundle to the single product. I refer to this

approach as the best product heuristic.

Participants in the single product target conditions had to compare single products and bundles, and three processes were possible. First, participants could fully process bundle context. This predicts no difference in evaluations across target type. Second, participants could focus only on single product context, which predicts no difference across contexts. Third, participants could use the best product heuristic, in which case the single target conditions should mirror the high load conditions in Experiment 2, since participants in both conditions would be using the more attractive product in each bundle more in evaluations. Based on prior research on constructive choice processes (e.g., Bettman, Luce and Payne 1998), I predict that consumers will use the best product heuristic in single target conditions.

- **H6:** Bundle context effects on target stimuli will be moderated by the type of target (individual product or bundled products) presented.
- **H7:** Attractiveness ratings for single product targets will be lower in the narrow than the wide bundle context, consistent with the use of the best product heuristic.

Method

Participants and design. One-hundred and forty-one students participated in this experiment for extra credit. Two participants were eliminated for failure to pass attention checks which left 139 participants for analysis. The design was a 3 (bundle context: narrow, wide, and high) by 2 (target type: bundle vs. single product) by 2 (target level: high vs. low) mixed design where bundle context and target type were between-subjects factors and target level was a within-subjects factor.

Stimuli. The stimuli for Experiment 3 consisted of the eight individual products and descriptions used in Experiment 1 (Table 4-1). Target type was manipulated by displaying targets consisting of the elegant dinner / Canon printer and the American Eagle T-shirt / 2 DVD

bundles in the bundle condition and only the Canon printer and only the 2 DVDs in the single product condition. The context bundles in the wide and narrow conditions were identical to those in Experiment 1. The high context condition consisted of only the MP3 player and the DVD player presented as individual products.

Procedure. The procedure for Experiment 3 was identical to Experiment 1. The only changes made were to the stimuli and conditions.

Results

Manipulation check. A two-way repeated-measures ANOVA showed a main effect of target attractiveness ($F(1,133) = 94.27$, $p < .001$) on attractiveness. Participants found the high target bundle to be more attractive than the low target bundle across conditions (M_{high}= 11.13 vs. M_{low} = 7.83). These results confirm that my manipulation of target bundle attractiveness was successful.

Does target type affect the influence of bundle context: A three-way repeated measures ANCOVA revealed a bundle context by target type by target level interaction ($F(1, 92) = 3.96$, $p < .05$), indicating that that manner in which participants accounted for bundle context varied between target types. For the bundled targets, results showed a main effect of bundle context ($F(1,57) = 4.03$, $p < .05$) and a bundle context by target level interaction ($F(1,57) = 8.87$, $p = .004$), replicating the results of Experiment 1 and indicating that the perceived attractiveness difference between target bundles was greater in the narrow context than the wide context (see Figure 7-1). In the single product target conditions, no significant bundle context by attractiveness interaction was found ($p > .25$), but a one-tailed test revealed a main effect of bundle context ($t(32) = 1.87$, $p < .05$).

Are consumers more likely to compare only the best products in the context bundles with single product targets: The tests for the single product target conditions, which revealed

no significant bundle context by target level interaction ($p > .25$) and a significant main effect of bundle context ($t(32) = 1.87$, $p < .05$, one-tailed), indicated that participants viewed targets less favorably in the narrow condition ($M_{\text{Wide}} = 9.73$ vs. $M_{\text{Narrow}} = 8.43$).

A second two-way ANCOVA comparing narrow and high bundle contexts found no significant bundle context by target level interaction ($p > .2$) and no significant main effect of bundle context ($p > .5$) on the attractiveness measure. The target bundles were not evaluated differently between the narrow and high conditions.

A third two-way ANCOVA comparing the high and wide bundle revealed no significant bundle context by target interaction, and a significant bundle context main effect ($t(29) = 1.91$, $p < .05$, 1-tailed) on the attractiveness measure. The target bundles were ranked more favorably in the wide context than in the high context ($M_{\text{Wide}} = 9.73$ vs. $M_{\text{High}} = 8.08$).

Discussion

The results of Experiment 4 provide evidence that people adjust the way in which they processed context depending upon whether they are evaluating a bundle or a single product. In the bundled target conditions, participants replicated the results of Experiment 1. For the single target conditions, the lack of a bundle context by attractiveness interaction between the wide and narrow bundle contexts, no significant difference between the high and narrow contexts, and the decrease in target evaluations from the wide to the high context indicates that participants largely made comparisons between the single target and context bundles based on the most attractive single product included in a bundle. This result implies that participants will use a convenient heuristic when evaluating bundle context when the target stimuli encourage the use of the heuristic.

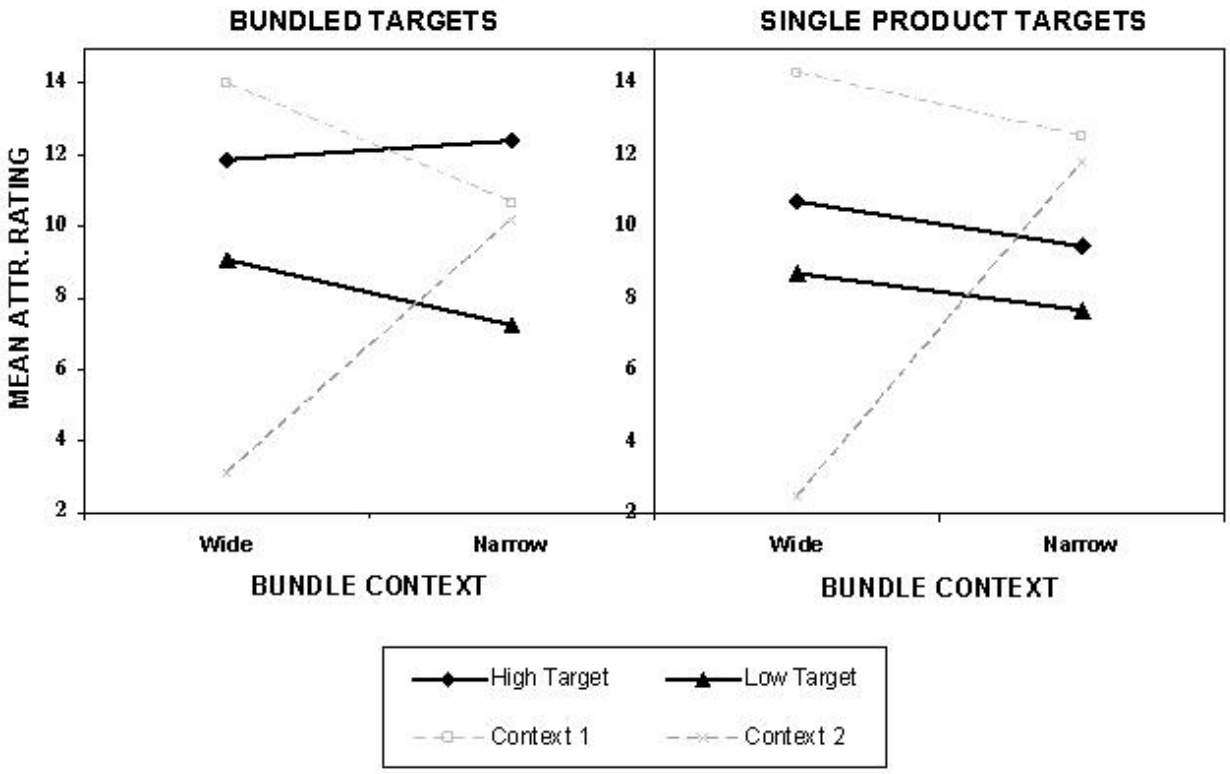


Figure 7-1. Attractiveness by Bundle Context by Type

CHAPTER 8
GENERAL DISCUSSION AND FUTURE RESEARCH

This research expands the literature on bundle evaluations by investigating a previously ignored context effect. In the past, research on context effects has generally involved manipulating the extremity of the context items (Herr 1989), the nature of the contextual products either by adding or subtracting products to the set (Huber, Payne and Puto 1982) or changing attribute levels within the contextual products (Chakravarti and Lynch 1983; Cooke and Mellers 1998). This paper provides evidence that when the set of contextual products remains constant, consumers are still sensitive to the composition of the contextual bundles.

Experiment 1 provided evidence of bundle context effects and explained how these effects could occur within the framework in Figure 4-1. I also provided evidence that consumers will evaluate contextual bundles with a process more consistent with an averaging process than an additive process. This finding is consistent with past bundle research (Gaeth et al. 1990; Yadav 1994). I extend the literature by showing that consumers use a process akin to a weighted average of the bundles constituent load when making judgments about other bundled stimuli, and the weighting can be moderated by cognitive load and the nature of the target product (single product or bundle).

Experiment 2 demonstrated that bundle context effects can be obtained using traditional complementary product bundles and showed that the results were due to changes in the cognitive representation of the bundles and not simply changes in use of the response scale. Beyond their theoretical value, these findings also have important managerial implications. They imply, for instance, that preference between bundles can be altered without changing the product assortment, just by changing the way products are bundled. Further research may investigate whether the perceptual differences found in bundle evaluations can be attributed to weighting or

scale perception differences, as the current experiments were designed to test the process and demonstrate that the effects were perceptual vs. response based.

Our results also indicate that the effects of bundle context can be attributed to an effortful comparison process. The findings are consistent with past research on context effects and inferences to the extent that the level of available cognitive resources can influence these effects (Gilbert 2002; Kardes et al. 2004; Martin, Seta and Crelia 1990; Meyers-Levy & Tybout 1997). However, whereas previous research (Martin, Seta and Crelia 1990; Meyers-Levy & Tybout 1997) found manipulations of cognitive load could shift the influence of context from contrast to assimilation. My research extends the existing literature by showing that bundle context influences evaluations in a systematically different manner when participants had relatively plentiful cognitive resources than when they had constrained resources. Presumably, the bundles themselves made the bundled products clearly members of another group, which led to contrast (Herr 1986) in both load conditions. If a switch between contrast and assimilation were the result of increasing load, we may expect to find an attenuation of the effect between high and low load conditions, but we would not expect the pattern of results shown in study three, which are consistent with an anchoring and adjustment process of bundle evaluation (Yadav 1994). The current research demonstrates these load effects in a purely stimulus-based environment and compares bundled products, whereas previous studies dealt with memory-based environments and single products, and this could explain portions of the differing results. Ultimately, in-depth explorations of how bundle context effects in memory-based environments differ from those in stimulus-based environments and how cognitive load differentially affects the contrast or assimilation of bundles versus single products are topics for further research.

Experiment 4 examined whether consumers would be prone to use convenient heuristics

when evaluating bundle context to conserve cognitive resources. Research on constructive consumer preferences (e.g., Bettman, Luce and Payne 1998) suggests that consumers act as cognitive misers making comparisons that are convenient and diagnostic (Feldman and Lynch 1988), which leads to the use simplifying heuristics that eliminate more taxing processes (Bettman, Luce and Payne 1998). These findings suggest that contextual information should influence evaluations to the extent that information is easy to use in contextual comparisons. My results support this prediction and suggest that other factors which make bundle context relatively more or less difficult to use will affect the magnitude of its influence on consumer evaluations.

A related area worthy of exploration involves evaluation mode. It is possible that whether bundles are evaluated separately or jointly will affect bundle context effects by influencing how difficult single product comparisons between bundles are relative to single product comparisons within bundles. If consumers are forced to form an evaluation of each individual bundle in isolation before evaluating the target stimuli (separate evaluation), it should be relatively more difficult to compare individual products between bundles than in a situation where all bundles are presented simultaneously (joint evaluation). These findings would be consistent with research in social psychology which demonstrated that the attractiveness ratings of two faces tended to contrast when presented singly and tended to assimilate when displayed jointly (Wedell et al. 1987). However, those findings were for single faces, not groups of faces, which would be a situation that is more comparable to bundle context. Presumably in separate evaluation, I would find assimilation within the bundles, but contrast between, which could amplify the effects of bundle context.

In future research, it will be important to expand my understanding of how consumers perceive bundle context. In these studies, I have narrowly defined the composition of the bundles as the pairings of the different contextual items in a stimulus-based environment. Previous research (e.g., Herr 1989) would suggest that priming different categories could affect classification of the stimuli, which could affect the perceived "composition" of the contextual bundles in a broader sense. This could lead to situations where bundle context could be manipulated without changing the pairings, but rather affecting the way participants perceive the products in the bundle to relate to each other. For example, the value of bundles could depend upon whether the constituent products were made by the same brand or different brands. Such results would have considerable implications for advertising and branding practice.

Another area for further exploration is investigating moderators of the dimensional effects found in Experiment 2. Presumably, factors that make it relatively more difficult for consumers to form overall dimensional evaluations of bundles will reduce the influence of the dimensional manipulations at the bundle level. This topic branches into a more general question of whether bundles are viewed more holistically or more as compilations of individual products. To the extent that consumers view the bundles as a whole, the bundle context should have relatively more effect on evaluations. Perhaps product bundles that are more prone to holistic evaluation (e.g., furniture bundles) would exhibit greater bundle context effects than bundles of products less prone to holistic evaluation.

The results discussed in this paper have demonstrated that consumers are sensitive to the contextual information of bundle composition when making evaluations, which I have termed bundle context. However, the extent to which this information is fully used in evaluations is moderated by the difficulty of interpreting the information relative to other evaluation heuristics.

Nevertheless, future research should explore more fully how consumers will integrate contextual information when evaluating bundled products, as the topic is important managerially and theoretically.

LIST OF REFERENCES

Adams, William J. and Janet L. Yellen (1976), "Commodity Bundling and the Burden of Monopoly," *Economic Journal*, 87 (September), 427-49.

Anderson, Norman H. (1981), *Foundations of Information Integration Theory*, New York, NY: Academic Press.

——— (1982), *Methods of Information Integration Theory*, New York, NY: Academic Press.

Bettman, James R., Mary Frances Luce, and John W. Payne (1998), "Constructive Consumer Choice Processes," *Journal of Consumer Research*, 25 (December), 187-217.

Birnbaum, Michael H. (1974), "The Nonadditivity of Personality Impressions," *Journal of Experimental Psychology*, 102 (March), 543-561.

Boush, David M. and Barbara Loken (1991), "A Process Tracing Study of Brand Extension Evaluations," *Journal of Marketing Research*, 28 (1), 16-28.

Chaiken, Shelly and Yaacov Trope (1999), *Dual Process Theories in Social Psychology*. NewYork: Guilford Press.

Chakravarti, Dipankar and John G. Lynch, Jr. (1983), "A Framework for Exploring Context Effects On Consumer Judgment and Choice," in *Advances in Consumer Research*, 10, ed. Richard Bagozzi and Alice Tybout, Ann Arbor, MI: Association for Consumer Research, 289-97.

Chakravarti, Dipankar, John G. Lynch, Jr. and Ansuree Mitra (1991), "Contrast Effects in Consumer Judgments: Changes in Mental Representations or the Anchoring of Rating Scales," *Journal of Consumer Research*, 18 (December), 284-297.

Cooke, Alan D. J. and Barbara A. Mellers (1998), "Multiattribute Judgment: Attribute Spacing Influences Single Attributes," *Journal of Experimental Psychology: Human Perception and Performance*, 24 (April), 496-504.

Cooke, Alan D. J., Claude Pecheux, and Elise Chandon (2005), "Subadditive Bundle Evaluations and the Value of Variety," working paper, Marketing Department, Warrington College of Business Administration, University of Florida, Gainesville, FL 32611.

Craik, Fergus I and Robert S. Lockhart (1972), "Levels of processing: A Framework for Memory Research," *Journal of Verbal Learning & Verbal Behavior,* 11(December) 671-684.

Della Bitta, Albert J. and Kent Monroe (1974), "The Influence of Adaptation Levels on Subjective Price Perceptions," *Advances in Consumer Research*, 1, 359-369.

Fechner, Gustav Theodor (1887/1987), "My Own Viewpoint on Mental Measurement," *Psychological Research*, 49 (December), 213-219.

Feldman, Jack M. and John G. Lynch (1988), "Self-Generated Validity and Other Effects of Measurement on Belief, Attitude, Intention, and Behavior," *Journal of Applied Psychology*, 73(August), 421-35.

Gaeth, Gary J., Irwin P. Levin, Goutam Chakraborty, and Aron M. Levin (1990), "Consumer Evaluation of Multi-Product Bundles: An information Integration Analysis," *Marketing Letters*, 2 (January), 47-57.

Gilbert, Daniel T. (2002), "Inferential Correction," in *Heuristics and Biases: the Psychology of Intuitive Judgment*, ed. T. Gilovich, D. Griffin, and D. Kahneman, Cambridge, England: Cambridge University Press, 167-184.

Helson, Harry (1964), *Adaptation-Level Theory*, New York, NY: Harper and Row.

Herr, Paul M. (1989), "Priming Price: Prior Knowledge and Context Effects," *Journal of Consumer Research*, 16 (June), 67-75.

Herr, Paul M., Steven J. Sherman and Russell H. Fazio (1983), "On the Consequences of Priming: Assimilation and Contrast Effects," *Journal of Experimental Social Psychology*, 19 (4), 323-340.

Hicks, John R. and Roy G. D. Allen (1934a), "A Reconsideration of the Theory of Value. Part I," *Economica*, 1 (February), 52-76.

——— (1934b), "A Reconsideration of the Theory of Value. Part II. A Mathematical Theory of Individual Demand Functions," *Economica*, 1 (May), 196-219.

Hsee, Christopher K. (1996), "The Evaluability Hypothesis: An Explanation of Preference Reversals between Joint and Separate Evaluations of Alternatives," *Organizational Behavior and Human Decision Processes*, 67 (September), 247-57.

——— (1998), "Less is better: When low-value options are valued more highly than high-value options," *Journal of Behavioral Decision Making*, 11 (June), 107-121.

Hsee, Christopher K. and France Leclerc (1998), "Will Products Look More Attractive When Presented Separately or Together?" *Journal of Consumer Research*, 25 (September), 175-86.

Huber, Joel, John W. Payne and Christopher Puto (1982), "Adding Asymmetrically Dominated Alternatives: Violations of Regularity and the Similarity Hypothesis," *Journal of Consumer Research*, 9(June), 90-98.

Huber, Joel and Christopher Puto (1982), "Market Boundaries and Product Choice: Illustrating Attraction and Substitution Effects," *Journal of Consumer Research*, 10 (June), 31-44.

Hutchinson, J. Wesley (1983), "On the Locus of Range Effects in Judgment and Choice," *Advances in Consumer Research*, 10 (1), 305-308.

Janiszewski, Chris and Donald R. Lichtenstein (1999), "A Range Theory Account of Price Perception," *Journal of Consumer Research*, 25(March), 353-68.

Kahneman, Daniel and Shane Frederick (2002) , "Inferential Correction," in *Heuristics and Biases: the Psychology of Intuitive Judgment*, ed. T. Gilovich, D. Griffin, and D. Kahneman, Cambridge, England: Cambridge University Press, 49-81.

Kahneman, Daniel and Amos Tversky (1979), "Prospect Theory: An Analysis of Decisions Under Risk," *Econometrica*, 47 (March), 263-292.

Kardes, Frank R., Steven S. Posavac, and Maria L. Cronley (2004), "Consumer Inference: A Review of Processes, Bases and Judgment Contexts," *Journal of Consumer Psychology*, 14 (3), 230-56.

Lancaster, Kelvin J. (1966), "A NEW APPROACH TO CONSUMER THEORY," *Journal of Political Economy*, 74 (2), 132-58.

Lewis, Michael J. (2006), "Customer Acquisition Promotions and Customer Asset Value," *Journal of Marketing Research*, 43 (May), 195-203.

List, John A. (2002), "Preference Reversals of a Different Kind: The "More Is Less" Phenomenon," *American Economic Review*, 92 (December), 1636-43.

Martin, Leonard L., John J. Seta, and Rick A. Crelia (1990), "Assimilation and contrast as a function of people's willingness and ability to expend effort in forming an impression," *Journal of Personality and Social Psychology*, 59 (July), 27-37.

McAlister, Leigh (1982), "A Dynamic Attribute Satiation Model of Variety-Seeking Behavior," *Journal of Consumer Research*, 9 (Sep), 141-150.

Mellers, Barbara A. Michael H. Birnbaum (1983), "Contextual Effects in Social Judgment," *Journal of Experimental Social Psychology*, 19 (March), 157-171.

Mellers, Barbara A. and Alan D. J. Cooke (1994), "Trade-Offs Depend on Attribute Range," *Journal of Experimental Psychology: Human Perception and Performance*, 20 (October), 1055-67.

Meyers-Levy, Joan and Brian Sternthal (1993), "A two-factor explanation of assimilation and contrast effects," *Journal of Marketing Research*, 30 (August), 359-368.

Meyers-Levy, Joan and Alice Tybout (1997), "Context effects at encoding and judgment in consumption settings: The role of cognitive resources," *Journal of Consumer Research*, 24 (June), 1-14.

Michaels, Walter C. and Harry Helson (1949), "A Reformulation of Fechner's Law in Terms of Adaptation Level Applied to Rating-Scale Data," *American Journal of Psychology*, 62 (July), 355-368.

Monroe, Kent (1971), "Measuring Price Thresholds by Psychophysics and Latitudes of Acceptance," *Journal of Marketing Research*, 8 (November), 460-464.

Niedrich, Ronald W., Subhash Sharma, and Douglas H. Wedell (2001), "Reference Price and Price Perceptions: A Comparison of Alternative Models," *Journal of Consumer Research*, 28 (December), 339-354.

Parducci, Allen (1965), "Category Judgment: A Range-Frequency Model," *Psychological Review*, 72 (November), 407-18.

Popkowski Leszczyc, Peter T. L., John W. Pracejus, and Michael Shen (in press) "Why More Can be Less: An Inference-Based Explanation for Hyper-Subadditivity in Bundle Valuation," *Organizational Behavior and Human Decision Processes*.

Roe, Robert M., Jerome R. Busemeyer and James T. Townsend (2001), "Multialternative Decision Field Theory: A Dynamic Connectionist Model of Decision Making," *Psychological Review*, 108 (2), 370-392.

Russo, J. Edward and Barbara A. Dosher (1983), "Strategies for multiattribute binary choice," *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 9 (October), 676-696.

Samuelson, Paul A. (1974), "Complementarity: An Essay on the 40th Anniversary of the Hicks-Allen Revolution in Demand Theory," *Journal of Economic Literature*, 12 (December), 1255-89.

Schneider, Walter and Richard M. Shiffrin (1977), "Controlled and Automatic Human Information Processing: I. Detection, Search, and Attention," *Psychological Review*, 84 (January), 1-66.

Schwarz, Norbert and Herbert Bless (1992), "Assimilation and contrast effects in attitude measurement: An inclusion/exclusion model," *Advances in Consumer Research*, 19 (1), 72-77.

Sherif, Muzafer, Daniel Taub and Carl Hovland, (1958), "Assimilation and Contrast Effects of Anchoring Stimuli on Judgments," *Journal of Experimental Psychology*, 55 (2), 150-155.

Simonson, Itamar (1989), "Choice Based on Reasons: The Case of Attraction and Compromise Effects,"*Journal of Consumer Research*, 16 (Sep), 158-174.

Simonson, Itamar, and Amos Tversky (1992), "Choice in Context: Tradeoff Contrast and Extremeness Aversion," *Journal of Marketing Research*, 29 (August), 281-95.

Tversky, Amos and Daniel Kahneman (1991), "Loss Aversion in Riskless Choice: A Reference Dependent Model," *Quarterly Journal of Economics*, 106 (November), 1040-1061.

Tversky, Amos and Itamar Simonson (1993), "Context-dependent Preferences," *Management Science*, 39 (Oct), 1179-1189.

Usher, Marius and James L. McClelland (2004), "Loss Aversion and Inhibition in Dynamical Models of Multialternative Choice," *Psychological Review*, 111 (3), 757-769.

Volkmann, John (1951), "Scales of Judgment and Their Implications for Social Psychology," in *Social Psychology at the Crossroads*, ed. John H. Rohrer and Muzafer Sherif, New York, NY: Harper, 273-296.

Wänke, Michaela, Herbert Bless, and Norbert Schwarz (1999a), "Assimilation and Contrast in Brand and Product Evaluations: Implications for Marketing," *Advances in Consumer Research,* 26 (1), 95-98.

——— (1999b), "Lobster, Wine, and Cigarettes: Ad Hoc Categorizations and the Emergence of Context Effects," *Marketing Bulletin,* 10 (May), 52-56.

Wedell, Douglas H. (1991), "Distinguishing Among Models of Contextually Induced Preference Reversals," *Journal of Experimental Psychology: Learning, Memory and Cognition*, 17 (July), 767-778.

Wedell, Douglas H. (1998), "Testing Models of Trade-off Contrast in Pairwise Choice," Journal of Experimental Psychology: Human Perception and Performance, 24(1), 49-65.

Wedell, Douglas H., Allen Parducci, and R. Edward Geiselman (1987), "A Formal Analysis of Ratings of Physical Attractiveness: Successive Contrast and Simultaneous Assimilation," *Journal of Experimental Social Psychology*, 23 (May), 230-49.

Wedell, Douglas H., Allen Parducci, and Michael Lane (1990), "Reducing the Dependence of Clinical Judgment of the Immediate Context: Effects of Number of Categories and Types of Anchors," *Journal of Personality and Social Psychology*, 58 (February), 319-329.

Wedell, Douglas H., and Jonathan C. Pettibone (1999), "Preference and the Contextual Basis of Ideals in Judgment and Choice," *Journal of Experimental Psychology: General*, 128 (September), 346-61.

Wittenbrink, Bernd, Charles M. Judd and Bernadette Park (2001), "Spontaneous Prejudice in Context: Variability in Automatically Activated Attitudes," Journal of Personality and Social Psychology, 81 (November), 815-27.

Yadav, Manjit S. (1994), "How Buyers Evaluate Product Bundles: A Model of Anchoring and Adjustment," *Journal of Consumer Research*, 21 (September), 342-53.

Yeung, Catherine and Dilip Somain (2005), "Attribute Evaluability and the Range Effect," *Journal of Consumer Research*, 32 (December), 363-69.

BIOGRAPHICAL SKETCH

Dan Hamilton Rice was born and raised in the fine state of New Hampshire. After graduating as valedictorian of his Concord High School class in 1994, he enrolled in the College of Engineering at Cornell University in Ithaca, NY, where he earned his bachelor's degree in civil environmental engineering in May 1998 with a cum laude distinction. After working in the telecommunications industry in the greater Boston area, Dan returned to Cornell University's Johnson Graduate School of Management in 2001 and earned his MBA in 2003. He entered the PhD program in marketing in the fall of 2003, completed his degree in the summer of 2008 and joined the marketing faculty at Louisiana State University in the fall of 2008 as an assistant professor.