

The Impact of Perceived Complementarity on Consumers' Evaluation of  
Bundles

Deny Bélisle

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## ABSTRACT

The Impact of Perceived Complementarity on Consumers' Evaluation of Bundles

Deny Bélisle, Ph.D.

Concordia University, 2010

Bundling strategy is widely used in today products and services markets. While determining which products to bundle together is a critical decision to the success of this strategy, there is a lack of empirical evidence about what type of interrelationship among products drives value in a bundle. Most literature on contingency levels (i.e., products' complementarity, substitutability or independence) has focused on the development of theoretical models and simulations of economical models. The few empirical works in this area reported that bundles of complements are more likely to be purchased than bundles of independent products, without determining the underlying mechanism of this finding.

In this dissertation, it is proposed that (1) perceived complementarity between bundled products is a key determinant for bundle value that exists to a certain extent in bundles from complementary, substitutable and independent product categories and (2) perceived complementarity is *malleable* depending on goals and contextual factors.

The first objective of this research is to develop a reliable and valid scale assessing the extent to which bundled products complement each other (study 1) and distinguish perceived complementarity from the related constructs of substitutability and independence. In study 2, the proposed effect of perceived complementarity on bundle evaluation is tested, using the new measure developed in study 1 with a different sample and a new set of bundles from complementary, substitutable and independent product categories.

In the second part of the dissertation, the author investigates how context and goals impact perceived complementarity between bundled products, thereby influencing bundle evaluation. The categorization literature provide important insight to the understanding of consumers' stable and flexible construction of product categories that can change bundle value depending on (a) which goal is salient to the individual in a particular situation (study 3) and (b) contextual factors such as image presentation format of the bundled products (study 4) and price discount strategy (study 5). Finally, boundary conditions of the impact of image presentation format on bundle value are examined in study 6. The theoretical and managerial implications of the six studies are finally discussed and their limitations and future research avenues are presented.

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## **Chapter 1: Introduction**

Bundling strategy refers to the selling of two or more products/services together at a single price (Stremersch and Tellis 2002). Examples of bundle offers include gift baskets, combos of phone, television, and Internet service, and all-inclusive vacations. Choosing the appropriate products to include in a bundle is a critical decision for managers that determines the success of the bundle (Harlam, Krishna, Lehmann, and Mela 1995). Marketers may opt for creating bundles of products from complementary, substitutable or independent product categories depending on whether their goal is to emphasize synergy among their products, offer variety to consumers, or favour the trial of a new product. Past research suggested that the contingency level among the bundled products (i.e., their complementarity, substitutability or independence) can influence bundle value and consumers' purchase intentions. Theoretical frameworks and simulations based on the economic perspective (e.g., Gultinan 1987; Venkatesh and Kamakura 2003) represent the classical approach to the study of contingency levels in a bundling context. In this area, researchers suggested that bundle reservation prices are expected to be related to products' contingency level, with complementary products yielding higher reservation prices. In another stream of research, Gaeth, Levin, Chakraborty, and Levin (1990) and Harlam et al. (1995) used observational data and reported that bundles composed of complementary products were more likely to be purchased than bundles of independent products.

Despite the importance of bundled products' complementarity, no scale is specifically developed to measure this construct and to differentiate it from related

constructs such as substitutability and independence of products. Apart from strictly functionally related complements (e.g., HP computer and HP printer) or strict substitutes (e.g., Colgate mint toothpaste and Colgate spearmint toothpaste), a variety of combinations of products exists in the marketplace. This variety in terms of complementarity, substitutability and independence has not been appropriately depicted in previous research, either in terms of stimuli used or of the development of targeted measures for each contingency level. Also, it is unknown whether a certain amount of complementarity exist in bundles that are commonly described as substitutes or independent products and whether the influence of complementarity on bundle value is the exclusive apanage of bundles of complements.

In order to understand the role of complementarity in determining bundle value, one of the objectives of this dissertation is to develop a reliable and valid scale assessing the extent to which bundled products complement each other. Accordingly, chapter 2 of this dissertation focuses on the development of a perceived complementarity measure. In study 1, described in chapter 2, a multi-item measure of perceived complementarity is developed and the discriminant validity of perceived complementarity from substitutability and independence perceptions is demonstrated. In study 2, presented in chapter 3, the proposed effect of perceived complementarity on bundle evaluation is tested, using the measure developed in study 1 with a different sample and a new set of bundles.

Following the scale development allowing for the assessment of perceived complementarity (study 1) and demonstrating its influence on bundle evaluation (study 2), the focus is shifted to understanding whether bundled products' perceived

complementarity can be enhanced in order to increase bundle value. It would be managerially insightful to understand how the characteristics of the bundle offer can be designed in a manner that increases perception of complementarity between bundled products, thus augmenting bundle value. A closer look into the categorization literature allows for the understanding of consumers' stable and flexible construction of product categories (see Barsalou 1982; 1985). Although consumers need stable representations of products and brands that give them stable anchors to their environments, they also need a certain amount of flexibility in order to adapt their reactions to the wide array of situations and unforeseen changes they may face in everyday life. Therefore, categories can change across different contexts depending on which goal is salient in a particular situation (Barsalou 1982). Barsalou (1983; 1985; 1987; 1989) argued that individuals actively construct category representations that allow them to achieve their targeted goals. For instance, Ratneshwar and Shocker (1991) reported that prototypical "snack foods" led to a different cognitive representation than prototypical "snacks that people might eat at a Friday evening party while drinking beer". When evaluating the second category, consumers selectively base their judgement upon goal-relevant attributes, such as saltiness or convenience, which are different from the first category attributes which refer to broader characteristics of snack food such as to sweetness, saltiness, portability, etc. These findings in the categorization literature led to an increasing shift in consumer research from an emphasis on product benefits to an accentuated interest in investigating the impact of goals and context on category representations (Loken 2006).

In line with this literature, this dissertation aims at investigating how context and goals impact perceived complementarity between bundled products (i.e., individual's

categorization of products as complements), thereby influencing bundle value. Can a bundle offer be visually designed in a way that enhances its perceived complementarity, without changing bundle composition (i.e., the products included in the bundle)? Does a price discount associated with the offer influence perceived complementarity between bundled products? Demonstrating the *malleable* nature of perceived complementarity to adapt to different contexts and goals is the main focus of studies 3, 4, 5, and 6. Specifically, study 3, presented in chapter 4, investigates how individual goals influence perceptions of complementarity and bundle value. In chapter 5, study 4 investigates the impact of image presentation format (i.e., whether products are presented in the same image or in separate images) on perceived complementarity and bundle value. In chapter 6, study 5 documents an interaction effect of image presentation format and pricing strategy (i.e., presenting the same price discount on product A versus on product B) on perceived complementarity, which in turn impacts bundle value. Study 6, presented in chapter 7, aims at showing how explicitly priming goals act as a boundary condition to the effect of image presentation format on perceived complementarity and bundle value. In the final chapter, the theoretical and managerial implications of the six studies are discussed and their limitations and future research avenues are presented.

## **Chapter 2: Study 1: The Development of Scales Measuring Perceived Complementarity, Substitutability, and Independence in a Bundling Context**

To investigate the role of bundled products' perceived complementarity, substitutability, and independence in bundle evaluation, it is crucial to use valid and reliable measures of perceived contingency levels between bundled products first. These scales need to be applicable across a wide range of product categories in order to ensure their generalizability. However, no measures fulfilling these criteria have been developed in the literature to date.

### **2.1 Different Approaches on Products' Contingency Levels**

Different conceptualizations of products' complementarity, substitutability, and independence have been adopted in the marketing literature (see Guiltinan 1987; Henderson and Quandt 1958; Lattin and McAlister 1985; Venkatesh and Kamakura 2003; Walters 1991). The economic perspective on products' contingency defines complementary and substitutable products as items presenting correlated cross-price elasticities (Henderson and Quandt 1958; Hicks 1946). For instance, if an increase (decrease) in the price of product A produces an increase (decrease) in the quantity demanded of product B, products A and B are considered complementary. On the other hand, substitutable products are those presenting the opposite correlation, where an increase (decrease) in the price of product A leads to a decrease (increase) in the quantity demanded of product B. Finally, independently valued products are items where an



increase (decrease) in the price of product A has no effect on the quantity demanded for product B. This definition is derived from macro-economic perspective that offers limited applicability in understanding how variations in terms of contingency perception at the consumer level influence bundle evaluation.

The bundling literature traditionally has adopted a different conceptualization to describe how bundled products are interrelated. Products are typically categorized as independently valued products when the reservation price of the bundle is equal to the sum of the individual items reservation prices, reflecting the strict additivity assumption (Adams and Yellen 1976; Gultinan 1987; Venkatesh and Kamakura 2003). When the reservation price of the bundle is higher than the sum of the items' reservation prices (i.e., superadditive), the products are said to be complementary. When the bundle reservation price is lower than individual items reservation prices (i.e., subadditive), bundled products are considered to be substitutes. However, this framework remains conceptual and lacks empirical validation. Past academic work that adopted this conceptualization of products' contingency level used it as a basic assumption in optimization models based on economics theories (see Adams and Yellen 1976; Gultinan 1987; Venkatesh and Kamakura 2003). Additionally, this approach in defining interrelationship among products is mute when consumers' reservation prices are unknown, therefore limiting its managerial applicability.

In order to develop contingency level scales, a third conceptualization, a consumer-needs-based approach, is adopted in this research. This approach presents the advantage of 1) using a consumer's standpoint, 2) being empirically measurable, 3) defining each contingency level with its specific characteristics differentiating it from the

others. According to this view, products' contingency levels represent the degree to which the products are (1) satisfying the same consumer need and consumed on separate occasions (i.e., substitutes) or (2) filling interrelated consumer needs and consumed jointly (i.e., complements) or (3) neither satisfying the same nor filling interrelated consumer needs and not meant to be consumed jointly (Lattin and McAlister 1985; Walters 1991). This definition offers the advantage of reflecting consumers' actual perceptions in terms of products' contingency. It is more managerially relevant since it would allow decision makers to associate consumers' actual perception of contingency with their actual evaluation of bundles. Furthermore, measuring products' contingency levels from the consumers' standpoint allows for verifying whether bundles designed and marketed as complements, substitutes or independents are actually perceived as such by consumers.

## **2.2 Contingency Levels Measures Using the Consumer Needs Perspective**

No specific scales have been developed to accurately measure complementarity, independence, and substitutability from a consumer point of view. Contrary to Lattin and McAlister's definition (1985), Harlam et al. (1995) conceptualized complementarity and independence as the two ends of a continuum. They therefore measured them with one item ranging from "unrelated" to "complementary". Single-item measures have been shown to suffer from a significant lack of validity, accuracy, and reliability, which originates from the insufficient information to estimate their psychometric properties (McIver and Carmines 1981). This type of measures has major undesirable characteristics such as considerable random errors, non discrimination among fine

degrees of an attribute, and lack of scope in representing a theoretical concept (see Nunnally and Bernstein 1994; McIver and Carmines 1981; Spector 1992 for a thorough discussion). In addition, this item does not discriminate between independence and complementarity given that it encompasses both notions. Simonin and Ruth (1995) conceptualized complementarity as “consumers' perceptions of the degree to which the products in the bundle fit together” and they measured it with two seven-point items: good-bad product combination and logical-not logical product combination. In addition to its poor psychometric properties, the scale lacks content validity given that it did not correspond to the consumer-needs based definition of contingency level (see Lattin and McAlister 1985 and Walters 1991). With regard to substitutability, there are no developed scales to measure this construct.

The objective of this study is to develop valid and reliable measures of complementarity, substitutability, and independence from a consumers' standpoint in a bundling context. This is the first step toward the understanding of the impact of products' contingency level in bundle evaluation.

## **2.3 Methodology**

### **2.3.1 Stimuli Selection**

In order to develop bundles of varying dominant contingency levels (complementary, substitutable, and independently perceived products), the author has first collected flyers from major retailers from different product categories in Montreal. All the flyers were then reviewed and an initial set of bundle offers were compiled. After

this preliminary compilation, he visited the real and virtual stores of a number of retailers and collected additional information about product characteristics in the bundle composition and price information. Based on this information, the researcher created five sets of bundle triplets for a total of 15 bundle offers (Table 1). In each triplet, the primary product was identical. However, the add-on product varied on the contingency level resulting in one complementary, one substitutable, and one independent products' bundle. For each primary product to be bundled, the associated product has been selected based on four criteria: (1) have the same price, (2) belong to the same umbrella brand, (3) have a similar brand image, and (4) have a similar product class familiarity as the primary product. Adopting the same umbrella brand for each bundle triplets was to increase realism. In practice, umbrella brands frequently promote bundles of its own individual brands (see Exhibit 1 for an example of Kraft food umbrella brand offer). However, brands from the same umbrella brand may have varying levels of contingency. Products included within each bundle had the same price in order to avoid any biases related to higher price perception for one specific product in the bundle. These elements have been assessed through the examination of existing bundle and product offers as described above.

**Exhibit 1: Example of a Bundle (Seasonal Gift Basket) Offered by Kraft  
Umbrella Brand and Including Different Individual Brands belonging to Kraft  
Company**



**2.3.2 Procedure**

A total of 107 undergraduate students from Concordia University participated in the study and received a course credit as compensation. Each participant viewed all fifteen bundles presented in a random order. This resulted in a total of 1605 observations

(107 \* 15). Participants were blind to the research purpose and were told that the research objective was to evaluate different bundle offers. The study was carried out using a paper and pencil questionnaire with presentation of product information for each bundle followed by the scale items. Participants were randomly assigned to different versions of the questionnaire where the order of presentation of the bundles varied (Table 1). Each bundle was briefly presented on the top of the page along with a small picture of the bundled products. Bundle description was immediately followed by measures of product complementarity, substitutability, and independence, presented on the same page.

### **2.3.3 Items Generation and Content Validity**

An initial pool of thirty items was developed through a comprehensive review of the existing literature on contingency level. The author used the consumer-based definitions of complementarity, substitutability, and independence (as presented in the literature review) in order to describe (1) the relationship between products' consumption situations (e.g., products consumed together for complements) and (2) the relationship between consumer needs (e.g., products satisfying the same needs for substitutes). All items were seven-point scales ranging from 1: Strongly disagree to 7: Strongly agree.

Two researchers, who served as expert judges, evaluated the items for content validity independently and eliminated items that do not adequately represent each construct. The final list contained 6 complementarity items, 6 substitutability items and 8 independence items.

### **2.3.4 Item Reduction**

Statistical analysis for the scale development was performed on nine out of fifteen bundles (bundles 1 to 9 in Table 1), the six remaining bundles (bundles 10 to 15 in Table 1) were left out to be used in a validity test. EQS 6.1 was used to perform confirmatory factor analyses on each scale and for each bundle contingency level. This resulted in the elaboration of nine confirmatory models. For example, three confirmatory models were developed for the complementarity scale: one model for bundles of complements, one model for bundles of substitutes, and one model for bundles of independent products. Similarly, three confirmatory models were developed for the substitutability scale and for the independence scale. Item deletion process followed the procedure suggested by Byrne (1994): for each scale (i.e., complementarity, substitutability, and independence), the items associated with the largest standardized residuals were iteratively deleted in each of the three confirmatory models associated with the scale (i.e., for bundles of complements, substitutes, and independent products). For each scale, the process was stopped when the three confirmatory models showed very good fit to the data based on both Chi-square values and fit indices (see Byrne 1994). The final scales of products' complementarity, substitutability, and independence contained the items that yielded good fit for all three types of bundles: complements, substitutes, and independent products bundles.

#### **2.3.4.1 Products' Complementarity Scale**

The final scale of products' complementarity was comprised of four items (Table 2). For bundles of complements, the Chi-square statistic of its confirmatory model was equal to 5.977 ( $df = 2$ ;  $p = .05$ ). The Bentler-Bonnett (1980) NFI, the Bentler (1990a) CFI, the Jöreskog-Sörbom's (1989) GFI, and the RMSEA values were equal to .97, .98,

.97, and .14 respectively. For bundles of substitutes, the Chi-square statistic was equal to 2.56 (df = 2; p = .29). The NFI, CFI, GFI, and RMSEA values were equal to .99, .99, .99, and .05 respectively. For bundles of independent products, the Chi-square statistic was equal to 11.60 (df = 2; p < .01). The NFI, CFI, GFI, and RMSEA values were equal to .97, .98, .95, and .21 respectively.

#### **2.3.4.2 Products' Substitutability Scale**

The final scale of products' substitutability was composed of four items (Table 2). For bundles of complements, the Chi-square statistic of its confirmatory model was equal to 2.77 (df = 2; p = .25). NFI, CFI, GFI, and RMSEA values were equal to .99, .99, .99, and .06 respectively. For bundles of substitutes, the Chi-square statistic was equal to 5.229 (df = 2; p = .07). The NFI, CFI, GFI, and RMSEA values were equal to .99, .99, .98, and .12 respectively. For bundles of independent products, the Chi-square statistic was equal to 2.88 (df = 2; p = .24). The NFI, CFI, GFI, and RMSEA values were equal to .99, .99, .99, and .06 respectively.

#### **2.3.4.3 Products' Independence Scale**

The final scale of products' independence contained four items (Table 2). For bundles of complements, the Chi-square statistic of its confirmatory model was equal to 1.30 (df = 2; p = .52). NFI, CFI, GFI, and RMSEA values were equal to .99, .99, .99, and .001 respectively. For bundles of substitutes, the Chi-square statistic was equal to .494 (df = 2; p = .78). The NFI, CFI, GFI, and RMSEA values were equal to .99, .99, .99, and .001 respectively. For bundles of independent products, the Chi-square statistic was equal to 8.157 (df = 2; p = .02). The NFI, CFI, GFI, and RMSEA values were equal to .98, .98, .97, and .17 respectively.



**Table 1: Stimuli for Study 1**

<b>Umbrella Brand</b>	<b>Complements</b>	<b>Substitutes</b>	<b>Independents</b>
Pepsi-Cola	Bundle 1: 14.1 oz. (400 grams) bag of Tostitos (\$3.00) AND 6-pack of Pepsi-Cola (710ml each) (\$3.00)	Bundle 2: 14.1 oz. (400 grams) bag of Tostitos (\$3.00) AND 11.3 oz. (320 grams) bag of Lay's chips (\$3.00)	Bundle 3: 14.1 oz. (400 grams) bag of Tostitos (\$3.00) AND 25.4 oz. (750ml) of Aunt Jemima Original Syrup (\$3.00)
Levi Strauss and Co.	Bundle 4: Levi's 510 blue jeans (\$60.00) AND Levi's blue Jacket (\$60.00)	Bundle 5: Levi's 510 blue jeans (\$60.00) AND Levi's 510 black jeans (\$60.00)	Bundle 6: Levi's 510 blue jeans (\$60.00) AND Dockers Getaway 24in. Upright luggage (\$60.00)
Procter and Gamble	Bundle 7: 12.6 oz. (375 ml) of Pantene Pro-V Classic Clean shampoo (\$5.00) AND 24 oz. (709ml) Ivory Aloe moisturizing body wash (\$5.00)	Bundle 8: 12.6 oz. (375 ml) of Pantene Pro-V Classic Clean shampoo (\$5.00) AND 12.6 oz. (375 ml) of Pantene Pro-V Daily Moisture Renewal shampoo (\$5.00)	Bundle 9: 12.6 oz. (375 ml) of Pantene Pro-V Classic Clean shampoo (\$5.00) AND 16.9 oz (500ml) of Febreze fabric freshener (\$5.00)
General Mills	Bundle 10: 18.5 oz. (525 grams) box of Cheerios cereals (\$3.50) AND 2L of 2% Québon milk (\$3.50)	Bundle 11: 18.5 oz. (525 grams) box of Cheerios cereals (\$3.50) AND 16.2 oz. (460 grams) box of Honey Nut Cheerios (\$3.50)	Bundle 12: 18.5 oz. (525 grams) box of Cheerios cereals (\$3.50) AND 14.9 oz. (440ml) of Old El Paso salsa (\$3.50)
Colgate	Bundle 13: 4.4 oz (130ml) of Colgate total "whitening" toothpaste (\$2.00) AND Colgate toothbrush (\$2.00)	Bundle 14: 4.4 oz (130ml) of Colgate total "whitening" toothpaste (\$2.00) AND 4.4 oz. (130ml) of Colgate total "Advanced Fresh" toothpaste (\$2.00)	Bundle 15: 4.4 oz (130ml) of Colgate total "whitening" toothpaste (\$2.00) AND 25 oz. (739ml) Palmolive Dishwashing liquid (\$2.00)

**Table 2: Final Items for Products' Complementarity, Substitutability, and Independence Scales**

**Products' complementarity scale:**

- C1- Product A and Product B are meant to be consumed together.
- C2- I mostly consume Product A and Product B together.
- C3- I think that most people consume Product A and Product B together.
- C4- Product A is more useful when consumed with Product B.

**Products' substitutability scale:**

- S1- I think Product A and Product B can substitute each other.
- S2- There are many consumption situations in which I can use either Product A or Product B to satisfy the same need.
- S3- I think that most people use Product A or Product B for similar consumption situations.
- S4- Product A and Product B can replace each other.

**Products' independence scale:**

- I1- Product A and Product B are designed to satisfy independent consumption needs.
- I2- I think that most people do not use Product A and Product B in the same consumption situation.
- I3- In general, people do not use Product A or Product B to satisfy complementary needs.
- I4- In general, people do not use Product A and Product B together to satisfy related needs.

### **2.3.5 Reliability Assessment**

All the three scales when applied to bundles of complements, substitutes, and independent products, exceeded the cut-off level of .70 for Cronbach's Alpha, recommended by Nunnally and Bernstein (1994). Specifically, the Cronbach's Alphas for the products' complementarity, substitutability, and independence scales were .94, .89, and .82, respectively. The scales also performed well across different bundles. The Cronbach's Alpha values for complementarity scale for bundles of complements, substitutes, and independents were .99, .90, and .94, respectively. For the products' substitutability scale, the Cronbach's Alphas for bundles of complements, substitutes, and independents were .85, .93, and .89, respectively. For the products' independence scale,

the Cronbach's Alphas for bundles of complements, substitutes, and independents were .79, .76, and .90, respectively.

### **2.3.6 Discriminant Validity**

Discriminant validity among the three constructs has been assessed using the robust CFA nested models method described by Bagozzi, Yi, and Phillips (1991) and Byrne (1994, p. 132). For each pair of constructs, evidence of discriminant validity was investigated by developing a two-factor confirmatory model (Model 1) where the two factors are freely correlated and another two-factor confirmatory model (Model 2) where the two factors are perfectly correlated (i.e., factor correlation equal to one). The larger the difference between Chi-squares and CFI's of Model 1 and Model 2, the stronger the evidence for discriminant validity among the two scales. This procedure was applied to each pair of constructs (i.e., products' complementarity and substitutability, complementarity and independence, and products' substitutability and products' independence) for each set of bundles (i.e., complements, substitutes, and independent products), thus resulting in the elaboration of a total of eighteen two-factor confirmatory models, nine of them freely correlated and the nine others perfectly correlated. All pairs of constructs showed strong evidence of discriminant validity. For bundles of complements, the chi-square difference between Model 1 and Model 2 was 16.71 ( $df = 1$ ;  $p < .01$ ), 29.60 ( $df = 1$ ;  $p < .01$ ), 81.58 ( $df = 1$ ;  $p < .01$ ) for products' complementarity scale versus products' substitutability scale, for the products' substitutability scale versus products' independence scale, and for the products' independence scale versus products' complementarity scale, respectively. For bundles of substitutes, the chi-square difference between Model 1 and Model 2 was equal to 78.07 ( $df = 1$ ;  $p < .01$ ), 72.79 ( $df = 1$ ;  $p <$

.01), 36.35 (df = 1; p < .01) for products' complementarity scale versus products' substitutability scale, for the products' substitutability scale versus products' independence scale, and for the products' independence scale versus products' complementarity scale, respectively. For bundles of independent products, the chi-square difference between Model 1 and Model 2 was equal to 132.17 (df = 1; p < .01), 112.20 (df = 1; p < .01), 126.74 (df = 1; p < .01) for products' complementarity scale versus products' substitutability scale, for the products' substitutability scale versus products' independence scale, and for the products' independence scale versus products' complementarity scale, respectively.

Discriminant validity has also been assessed through the comparison of the mean scores of complementarity, substitutability, and independence for each type of bundle. Multiple pairwise comparisons using paired t-tests and Bonferroni adjustment were calculated in order to compare bundles of complements, substitutes, and independent products in terms of their mean scores of complementarity, substitutability, and independence. For bundles of complements (i.e., Tostitos tortilla chips + Pepsi-cola soft drinks, Levi's blue jean + Levi's blue jacket, and Pantene Classic Clean shampoo + Ivory body wash), the mean score of products' complementarity ( $M_{\text{Complementarity of complements}} = 4.745$ ) was significantly higher than the mean score of products' substitutability ( $M_{\text{Substitutability of complements}} = 3.076$ ,  $t(106) = 13.99$ ,  $p < .01$ ) and of products' independence ( $M_{\text{Independence of complements}} = 3.63$ ;  $t(106) = 7.29$ ,  $p < .01$ ). For bundles of substitutes (i.e., Tostitos tortilla chips + Lay's potato chips, Levi's blue jean + Levi's black jeans, and Pantene Classic Clean shampoo + Pantene Daily Moisture Renewal shampoo), the mean score of products' substitutability ( $M_{\text{Substitutability of substitutes}} = 5.33$ ) was significantly higher

than the mean score of products' complementarity ( $M_{\text{Complementarity of substitutes}} = 2.85$ ,  $t(106) = 13.75$ ,  $p < .01$ ) and of products' independence ( $M_{\text{Independence of substitutes}} = 3.50$ ,  $t(106) = 10.78$ ,  $p < .01$ ). For bundles of independent products (i.e., Tostitos tortilla chips + Aunt Jemima corn syrup, Levi's blue jean + Dockers luggage, and Pantene Classic Clean shampoo + Febreze fabric freshener), the mean score of products' independence ( $M_{\text{Independence of independent products}} = 5.58$ ) was significantly higher than the mean score of products' complementarity ( $M_{\text{Complementarity of independent products}} = 1.95$ ,  $t(106) = 18.93$ ,  $p < .01$ ) and of products' substitutability ( $M_{\text{Substitutability of independent products}} = 1.77$ ,  $t(106) = 22.46$ ,  $p < .01$ ). Overall, the results of pairwise comparisons suggested that the measures of complementarity, substitutability and independence were distinct.

### **2.3.7 Scale Validation**

In order to test for the external validity of the measures and verify their generalizability, the developed scales of products' complementarity, substitutability, and independence were applied to six additional bundles: two bundles of complements (bundle 10 [Cheerios cereals + Québon milk] and bundle 13 [Colgate whitening toothpaste + Colgate toothbrush] in Table 1), two bundles of substitutes (bundle 11 [Cheerios cereals + Honey Nuts cereals] and bundle 14 [Colgate whitening toothpaste + Colgate Advanced Fresh toothpaste] in Table 1), and two bundles of independent products (bundle 12 [Cheerios cereals + Old El Paso salsa] and bundle 15 [Colgate whitening toothpaste + Palmolive dishwashing liquid] in Table 1). Confirmatory factor analyses were performed on each scale (complementarity, substitutability, and independence) for each of the six bundles. The eighteen CFA models showed good fit of the data (Table 3).

Scale validity was assessed by comparing the mean scores of complementarity, substitutability, and independence associated with each of the six bundles under study. Multiple pairwise comparisons using Bonferroni adjustment showed strong evidence of external validity. Mean scores of complementarity, substitutability, and independence were compared among each bundle of complements, substitutes, and independent products. In addition, for each of the six bundles, the mean scores of products' complementarity, substitutability and independence were compared.

As expected, the mean score of the products' complementarity scale was significantly higher for bundles of complementary products ( $M_{\text{Complementarity}} = 6.07$  for bundle 10 [Cheerios cereals + Québon milk];  $M_{\text{Complementarity}} = 5.46$  for bundle 13 [Colgate whitening toothpaste + Colgate toothbrush]) than for bundles of substitutable products ( $M_{\text{Complementarity}} = 1.78$ ;  $t(105) = 17.47$ ,  $p < .01$  for bundle 11 [Cheerios cereals + Honey Nuts cereals];  $M_{\text{Complementarity}} = 1.56$ ;  $t(106) = 12.01$ ,  $p < .01$  for bundle 14 [Colgate whitening toothpaste + Colgate Advanced Fresh toothpaste]) and for bundles of independent products ( $M_{\text{Complementarity}} = 2.40$ ;  $t(106) = 21.70$ ,  $p < .01$  for bundle 12 [Cheerios cereals + Old El Paso salsa];  $M_{\text{Complementarity}} = 2.67$ ,  $t(105) = 19.05$ ,  $p < .01$  for bundle 15 [Colgate whitening toothpaste + Palmolive dishwashing liquid]). Similar results were found for the products' substitutability scale, where the two bundles of substitutes showed a higher mean score ( $M_{\text{Substitutability}} = 5.84$  for bundle 11 [Cheerios cereals + Honey Nuts cereals];  $M_{\text{Substitutability}} = 5.45$  for bundle 14 [Colgate whitening toothpaste + Colgate Advanced Fresh toothpaste]) than bundles of complements ( $M_{\text{Substitutability}} = 2.58$ ,  $t(105) = 16.94$ ,  $p < .01$  for bundle 10 [Cheerios cereals + Québon milk];  $M_{\text{Substitutability}} = 2.87$ ,  $t(106) = 14.20$ ,  $p < .01$  for bundle 13 [Colgate whitening

toothpaste + Colgate toothbrush]) and for bundles of independent products ( $M_{\text{Substitutability}} = 2.23$ ,  $t(105) = 17.04$ ,  $p < .01$  for bundle 12 [Cheerios cereals + Old El Paso salsa];  $M_{\text{Substitutability}} = 1.71$ ,  $t(105) = 16.67$ ,  $p < .01$  for bundle 15 [Colgate whitening toothpaste + Palmolive dishwashing liquid]). Finally, the products' independence scale was also associated with a higher mean score for bundles of independent products ( $M_{\text{Independence}} = 5.83$  for bundle 12 [Cheerios cereals + Old El Paso salsa];  $M_{\text{Independence}} = 5.84$  for bundle 15 [Colgate whitening toothpaste + Palmolive dishwashing liquid]) than bundles of complements ( $M_{\text{Independence}} = 2.98$ ,  $t(106) = 13.92$ ,  $p < .01$  for bundle 10 [Cheerios cereals + Québon milk];  $M_{\text{Independence}} = 2.55$ ,  $t(105) = 13.68$ ,  $p < .01$  for bundle 13 [Colgate whitening toothpaste + Colgate toothbrush]) and for bundles of substitutes ( $M_{\text{Independence}} = 3.48$ ,  $t(105) = 12.42$ ,  $p < .01$  for bundle 11 [Cheerios cereals + Honey Nuts cereals];  $M_{\text{Independence}} = 3.93$ ,  $t(105) = 8.90$ ,  $p < .01$  for bundle 14 [Colgate whitening toothpaste + Colgate Advanced Fresh toothpaste]).

For bundles of complements, the mean score of products' complementarity ( $M_{\text{Complementarity}} = 6.08$  for bundle 10 [Cheerios cereals + Québon milk],  $M_{\text{Complementarity}} = 5.47$  for bundle 13 [Colgate whitening toothpaste + Colgate toothbrush]) was significantly higher than the mean score of products' substitutability ( $M_{\text{Substitutability}} = 2.56$ ,  $t(106) = 20.34$ ,  $p < .01$  for bundle 10 [Cheerios cereals + Québon milk];  $M_{\text{Substitutability}} = 2.87$ ,  $t(106) = 12.61$ ,  $p < .01$  for bundle 13 [Colgate whitening toothpaste + Colgate toothbrush]) and of products' independence ( $M_{\text{Independence}} = 2.99$ ,  $t(106) = 14.80$ ,  $p < .01$  for bundle 10 [Cheerios cereals + Québon milk];  $M_{\text{Independence}} = 2.54$ ,  $t(106) = 11.28$ ,  $p < .01$  for bundle 13 [Colgate whitening toothpaste + Colgate toothbrush]). Similarly, the mean score of products' substitutability was significantly higher for bundles of

substitutes ( $M_{\text{Substitutability}} = 5.84$  for bundle 11 [Cheerios cereals + Honey Nuts cereals],  $M_{\text{Substitutability}} = 5.46$  for bundle 14 [Colgate whitening toothpaste + Colgate Advanced Fresh toothpaste]), that the mean score of products' complementarity ( $M_{\text{Complementarity}} = 2.56$ ,  $t(105) = 16.34$ ,  $p < .01$  for bundle 11 [Cheerios cereals + Honey Nuts cereals];  $M_{\text{Complementarity}} = 2.66$ ,  $t(106) = 12.34$ ,  $p < .01$  for bundle 14 [Colgate whitening toothpaste + Colgate Advanced Fresh toothpaste]) and of products' independence ( $M_{\text{Independence}} = 3.48$ ,  $t(105) = 10.58$ ,  $p < .01$  for bundle 11 [Cheerios cereals + Honey Nuts cereals];  $M_{\text{Independence}} = 3.92$ ,  $t(106) = 6.79$ ,  $p < .01$  for bundle 14 [Colgate whitening toothpaste + Colgate Advanced Fresh toothpaste]) associated with these bundles. For bundles of independent products, the mean score of products' independence ( $M_{\text{Independence}} = 5.84$  for bundle 12 [Cheerios cereals + Old El Paso salsa];  $M_{\text{Independence}} = 5.840$  for bundle 15 [Colgate whitening toothpaste + Palmolive dishwashing liquid]) was also significantly higher than the mean score of products' complementarity ( $M_{\text{Complementarity}} = 1.78$ ,  $t(106) = 17.87$ ,  $p < .01$  for bundle 12 [Cheerios cereals + Old El Paso salsa];  $M_{\text{Complementarity}} = 1.56$ ,  $t(105) = 20.43$ ,  $p < .01$  for bundle 15 [Colgate whitening toothpaste + Palmolive dishwashing liquid]) and of products' substitutability ( $M_{\text{Substitutability}} = 2.22$ ,  $t(106) = 16.27$ ,  $p < .01$  for bundle 12 [Cheerios cereals + Old El Paso salsa];  $M_{\text{Substitutability}} = 1.71$ ,  $t(105) = 18.44$ ,  $p < .01$  for bundle 15 [Colgate whitening toothpaste + Palmolive dishwashing liquid]).



**Table 3: Assessment of the External validity: CFA Models**

	Chi-square (df, p)	NFI	CFI	GFI	RMSEA
<b>Products' complementarity scale</b>					
<i>Bundles of complements:</i>					
Bundle 10	3.87 (2, p=.14)	.99	.99	.98	.09
Bundle 13	5.29 (2, p=.07)	.98	.98	.98	.13
<i>Bundles of substitutes:</i>					
Bundle 11	11.48 (2, p<.01)	.93	.94	.95	.21
Bundle 14	0.01 (2, p=.99)	.99	.99	.99	.0001
<i>Bundles of independent products:</i>					
Bundle 12	23.27 (2, p<.01)	.91	.91	.90	.32
Bundle 15	27.99 (2, p<.01)	.86	.87	.89	.35
<b>Products' substitutability scale</b>					
<i>Bundles of complements:</i>					
Bundle 10	6.64 (2, p=.04)	.97	.98	.97	.15
Bundle 13	13.77 (2, p<.01)	.94	.95	.95	.24
<i>Bundles of substitutes:</i>					
Bundle 11	15.01 (2, p<.01)	.94	.95	.94	.25
Bundle 14	14.26 (2, p<.01)	.95	.95	.94	.24
<i>Bundles of independent products:</i>					
Bundle 12	15.76 (2, p<.01)	.95	.96	.93	.25
Bundle 15	2.56 (2, p=.28)	.99	.99	.99	.05
<b>Products' independence Scale</b>					
<i>Bundles of complements:</i>					
Bundle 10	13.50 (2, p<.01)	.91	.92	.94	.23
Bundle 13	1.88 (2, p=.39)	.97	.99	.99	.0001
<i>Bundles of substitutes:</i>					
Bundle 11	7.06 (2, p=.03)	.94	.95	.97	.16
Bundle 14	6.98 (2, p=.03)	.92	.94	.97	.15
<i>Bundles of independent products</i>					
Bundle 12	0.88 (2, p=.64)	.99	.99	.99	.0001
Bundle 15	6.00 (2, p=.05)	.92	.94	.97	.14

## **2.4 Discussion**

Scales for the measurement of products' complementarity, substitutability, and independence in a bundling context were developed in study 1. These scales exhibited reliability and construct validity across fifteen bundles from five umbrella brands. There was sufficient evidence for convergent and discriminant validity of the scale. Confirmatory factor analysis demonstrated the stability of the factor solution across a wide range of bundles varying in terms of price and product category (i.e., food, clothing, and personal care).

### **Chapter 3: Study 2: The Impact of Perceived Products' Contingency Level on Bundle Evaluation**

In study 2, the measurement scales of perceived complementarity, substitutability, and independence developed in study 1 are adopted to investigate the impact of perceived complementarity on consumers' willingness to buy the bundle, across different bundle contingency levels. This study also aims at investigating the nomological validity of the complementarity scale.

The approach to the study of bundling, and specifically research pertaining to the interrelationship among bundled products, has traditionally been the development of normative economic models and simulations. Guitinan's (1987) theoretical model and Venkatesh and Kamakura's (2003) simulations are typical works in this area. In these papers, the degree of complementarity was considered as the key to the success of a bundling strategy and is closely tied to bundle value. By definition, complementarity has been included in these models as the additional value consumers derive from owning or consuming two related products, exceeding the sum of their individual values (Venkatesh and Kamakura 2003). Thus, when bundle reservation price exceeded the sum of the individual items prices, bundled products were considered as complements. In these models, complementarity of the bundle has typically been a model assumption, not empirically demonstrated.

Another approach to the link between complementarity and bundle value has been adopted by Harlam et al. (1995) and Simonin and Ruth (1995). In a consumer-oriented experiment, Harlam et al. (1995) found that bundles composed of complements were

associated with a higher purchase intention than bundles of unrelated products. In the context of new product introduction, Simonin and Ruth (1995) reported that complementarity enhances the impact of prior attitudes toward the new product brand on attitudes toward the bundle but they could not find a significant impact of complementarity on the relationship between prior attitudes and the reservation price for the bundle. More recently, Estelami (1999) conducted a field study where he sampled bundle prices for three product categories: fast food, photographic equipment, and personal computers. He found that 3% to 12% of the bundles of complements were priced higher than the sum of the individual items. He argued that this phenomenon occurs because of the simplification strategies consumers use to reduce their cognitive effort, influenced by the manner in which the bundle was presented. He also proposed that consumers rely on the sellers' judgment and expertise in providing a working system of products as a bundle, even if this lead to paying a bundle surcharge, which implied paying a higher price for a bundle than the sum of the individual products. These results suggest that complementarity level among bundled products increases bundle value for bundles of complements, as reflected by the price retailers actually adopted for their bundle offers.

In sum, although past literature supported the existence of a link between perceived complementarity and bundle evaluation, the study of the impact of complementarity perception on bundle evaluation has been limited to bundles of complementary product categories. In addition, there was no systematic empirical investigation about the potential impact of perception of substitutability and perceived product independence on bundle evaluation. The current study aims at testing the link

between perceived complementarity and willingness to buy the bundle for bundles of complements, substitutes, and independent products, using the multiple-items measures of perceived contingency levels developed in study 1. Perceived complementarity due to joint use/consumption and synergy between products is expected to be positively related to bundle value.

**H1: Perceived complementarity between bundled products increases consumers' willingness to buy the bundle.**

### **3.1 Methodology**

#### **3.1.1 Stimuli and Procedure**

Two of the five sets of bundle triplets used in study 1 were selected for this study, for a total of 6 bundle offers (Table 4). Bundle triplets that presented the highest scores of complementarity, substitutability or independence in study 1 were used in study 2 (i.e., those with umbrella brands: Pepsi-Cola and Procter and Gamble). Similar to study 1, the primary product in each triplet was identical while the add-on product varied on the contingency level resulting in one complementary, one substitutable, and one independent product bundle.

A total of 288 undergraduate students from Concordia University participated in the study and received \$5 for compensation. Participants were blind to the research purpose and were told that the research objective was to evaluate different bundle offers. The study was carried out using a paper and pencil questionnaire where product information was presented first for each bundle and followed by the various measures.

Each participant evaluated only one bundle and was randomly handed out one of the six versions of the questionnaire (Table 4).

### 3.1.2 Measures

Participants were first presented with a bundle offer composed of the two individual products briefly described on top of the page along with a picture of the bundled products. Bundle description was immediately followed by the three-item scale of willingness to buy adopted by Dodds, Monroe, and Grewal (1991). Next, participants were asked to complete measures of perceived complementarity, substitutability, and independence developed in study 1. Finally, participants completed demographics measures. These measures were not repeated and each questionnaire included only one bundle (see Table 4). An example of the measures used is presented in Exhibit 2 for the bundle of Tostitos tortilla chips and Pepsi-Cola soft drinks.

**Table 4: Stimuli for Study 2**

<b>Umbrella Brand</b>	<b>Complements</b>	<b>Substitutes</b>	<b>Independent products</b>
Pepsi-Cola	<p>Bundle 1:</p> <p>14.1 oz. (400 grams) bag of Tostitos (\$3.00) AND 6-pack of Pepsi-Cola (710ml each) (\$3.00)</p>	<p>Bundle 2:</p> <p>14.1 oz. (400 grams) bag of Tostitos (\$3.00) AND 11.3 oz. (320 grams) bag of Lay's chips (\$3.00)</p>	<p>Bundle 3:</p> <p>14.1 oz. (400 grams) bag of Tostitos (\$3.00) AND 25.4 oz. (750ml) of Aunt Jemima Original Syrup (\$3.00)</p>
Procter and Gamble	<p>Bundle 4:</p> <p>12.6 oz. (375 ml) of Pantene Pro-V Classic Clean shampoo (\$5.00) AND 24 oz. (709ml) Ivory Aloe moisturizing body wash (\$5.00)</p>	<p>Bundle 5:</p> <p>12.6 oz. (375 ml) of Pantene Pro-V Classic Clean shampoo (\$5.00) AND 12.6 oz. (375 ml) of Pantene Pro-V Daily Moisture Renewal shampoo (\$5.00)</p>	<p>Bundle 6:</p> <p>12.6 oz. (375 ml) of Pantene Pro-V Classic Clean shampoo (\$5.00) AND 16.9 oz (500ml) of Febreze fabric freshener (\$5.00)</p>

## Exhibit 2 : Dependent Variable Items for Study 2

### Willingness to buy:

	Strongly disagree			Strongly agree			
At the price shown, I would consider buying this bundle of a 14.1 oz. bag of Tostitos and a 6-pack of Pepsi-Cola:	1	2	3	4	5	6	7
The probability that I would consider buying this bundle of a 14.1 oz. bag of Tostitos and a 6-pack of Pepsi-Cola is:	1	2	3	4	5	6	7
My willingness to buy this bundle of a 14.1 oz. bag of Tostitos and a 6-pack of Pepsi-Cola is:	1	2	3	4	5	6	7

## 3.2 Results

To test for the impact of complementarity, substitutability, and independence on willingness to buy, analyses were conducted at the aggregate level, contingency level, bundle level, and umbrella brand level.

### 3.2.1 Aggregate Level Analyses

At the aggregate level, the expected pattern of results (Figure 1) was supported by a structural equations model. When data for both Pepsi-Cola and Procter and Gamble brands was analyzed jointly, only perceived complementarity ( $\beta = .36$ ,  $t(268) = 7.84$ ,  $p < .01$ ) had a significant impact on willingness to buy, as expected.

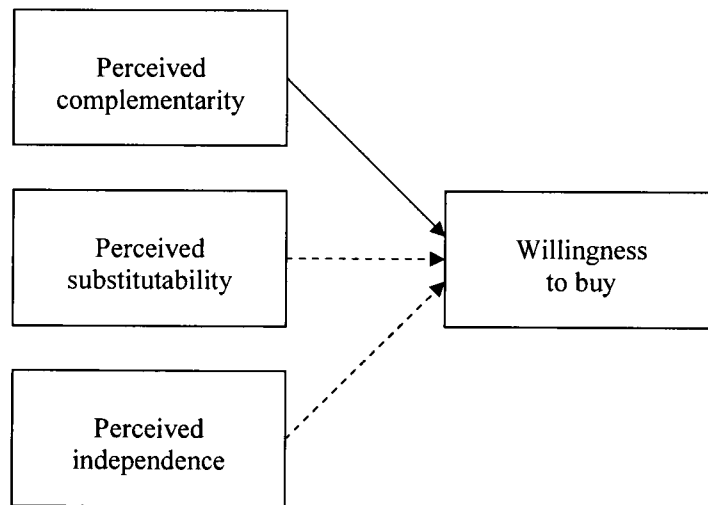
### 3.2.2 Contingency Level Analyses

Next, structural equations analyses were repeated for each contingency level. For aggregated bundles of complements and aggregated bundles of substitutes, only perceived complementarity ( $\beta = .42$ ,  $t(98) = 4.40$ ,  $p < .01$ ;  $\beta = .42$ ,  $t(98) = 4.40$ ,  $p < .01$ ;  $\beta = .37$ ,  $t(82) = 3.54$ ,  $p < .01$ ; respectively) had a significant impact on willingness to buy, as

expected. Only aggregated bundles of independent products yielded no significant impact of contingency level on willingness to buy.

### 3.2.3 Bundle Level Analyses

For each bundle, a separate regression analysis was conducted to test the hypothesized relationships (see Figure 1). Regression models were used instead of structural equation models for bundle level analysis due to the number of observations available at the bundle level. As expected, for all bundle combinations and for both umbrella brand, only perceived complementarity significantly and positively influenced consumers' willingness to buy (see Table 5). In addition, for most of the models, perceived complementarity accounted for at least 20% of the variance.



**Figure 1: Hypothesized Model for Study 2<sup>1</sup>**

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<sup>1</sup> The bold line is expected to be significant at  $p < .05$ . Dashed lines are not expected to be significant at  $p < .05$ .



### 3.2.4 Umbrella Brand Level Analyses

Additional analyses were undertaken at the umbrella brand level including observations for bundles of complements, substitutes and independent products. Given that the number of observations was sufficient, two structural equations models were built, one for each umbrella brand.

For both Pepsi-Cola and Procter and Gamble brands, only perceived complementarity had a significant impact on willingness to buy ( $\beta = .33$ ,  $t(149) = 4.52$ ,  $p < .01$  for Pepsi-Cola and  $\beta = .41$ ,  $t(137) = 6.78$ ,  $p < .01$  for Procter and Gamble), as expected.

**Table 5: Regressions Results for Study 2: The Impact of Perceived Complementarity on WTB at the Bundle Level**

Brand/contingency level	Variance explained (%)	t-values (df)	Standardized $\beta$ for perceived complementarity	p-value
<i>Pepsi-Cola umbrella brand</i>				
Complements (tortilla chips + soft drinks)	20.71	3.54 (1, 48)	.46	<.01
Substitutes (tortilla chips + potato chips)	8.4	1.93 (1, 48)	.30	.06
Independent products (tortilla chips + corn syrup)	30.04	4.54 (1, 48)	.55	<.01
<i>Procter and Gamble umbrella brand</i>				
Complements (shampoo + conditioner)	23.1	4.14 (1, 57)	.48	<.01
Substitutes (two different shampoos)	48.57	5.75 (1, 36)	.70	<.01
Independent products (shampoo + fabric freshener)	18.27	2.95 (1, 39)	.43	<.01

### 3.3 Discussion

All the analyses run at the aggregate level, bundle level, contingency level, and the umbrella brand level showed a significant impact of perceived complementarity on willingness to buy the bundle. Neither substitutability nor independence influenced significantly bundle evaluation. These results demonstrate the nomological validity of the perceived complementarity scale. They show empirically the link between product complementarity and bundle value suggested by past literature.

This study corroborates the discriminant validity among perceived complementarity, substitutability and independence constructs demonstrated in study 1, using a different sample. The scales were stable when analyses were run at the aggregate level, contingency level, umbrella brand level and bundle level. In most of these analyses, perceived complementarity consistently had a significant impact on willingness to buy while neither substitutability nor independence had any impact.

Unlike past research (Harlam et al. 1995), this is a new approach that no longer views complementarity/independence as a continuum. These findings call for a more cautious categorization of bundles and highlights the importance of a consumer-oriented evaluation of the interrelationship among bundled products since consumers' perception of complementarity is the value-trigger. Study 2 results demonstrate that complementarity perception is a key factor affecting bundle value, irrespective of bundle composition. Managers should therefore look for ways to increase perception of complementarity even if the bundled products belong to independent or substitutable products categories. This issue is critical for managers exploring the possibility to create

bundle offers in order to implement a brand extension (i.e., where a new product is bundled with an existing product from a different product line, producing bundles of complementary or independently valued products: such as Arm and Hammer brand offering toothpaste or Ivory brand offering dishwashing liquid as a brand extension) or a line extension (i.e., where a new product is associated with an existing product from the same line, producing bundles of substitutable products, such as Crest offering a new toothpaste with long lasting mint flavour).

#### **Chapter 4: Study 3: The Impact of Goals on Perceived Complementarity**

Study 2 results highlight the importance of bundled products' complementarity perception on consumers' evaluation of the bundle offer. In addition, this study shows that the perception of products' complementarity varies across individuals and that identical product combinations produce varying degrees of perceived complementarity. The purpose of the current study is to investigate the malleability of perceived complementarity by studying the role of consumer goals (i.e., restriction versus indulgence goal) on perceived complementarity between bundled products and willingness to buy the bundle.

The literature on categorization (see Barsalou 1982; 1989; 1991) suggests that individuals have a primary and a secondary categorization system. The former system manages object recognition and focus on categorizing objects into static taxonomies. The latter system creates ad hoc categories targeting the fulfilment of specific goals. This second component emphasizes the flexibility of categorization and its close ties to individual goals and context. In line with this framework, flexibility and context dependence has been reported in the categorization process involved in the perception and the evaluation of brand extensions (see Aaker and Keller 1990; Barsalou 1985; Boush and Loken 1991). For instance, Barsalou (1985) found that when assessing typicality, individuals may not use one organizing principle, such as similarity to a prototype, but they may instead build a category based on functional goals. In the same vein, it is argued in this study that contextual factors, such as personal goals, favor the creation of ad hoc categories that will enhance or reduce perception of complementarity

among bundled products. Specifically, when both bundled products present attributes that are closely associated with the consumers' goal (e.g., diet soft drinks and low fat chips under a weight control restriction goal), the products will be perceived as being more complementary than when these same products are associated with a goal that is not coherent with products attributes (e.g., diet soft drinks and low fat chips under an indulgence goal). It is therefore proposed that:

**H2: Bundle products' (a) perceived complementarity, (b) bundle appeal, and c) willingness to buy will be higher when a consumer's goal is congruent with bundled products goal-relevant attributes than when the goal is not congruent.**

## 4.1 Methodology

### 4.1.1 Design and Stimuli

A 2 (goals: restriction versus indulgence) × 2 (bundle type: bundles with restriction-related attributes products versus bundles with indulgence-related attributes products) between-subjects design was adopted in study 3. No interaction effects were expected. Two sets of stimuli were used in order to create a total of 6 bundles (i.e., 3 bundles composed of two restriction products and 3 bundles composed of two indulgence products). Multigrain tortillas chips + diet soft drinks, low fat vanilla flavoured frozen yogurt + organic raisins multigrain granola bars, and artisan French bread + chickpea puree represented bundle combinations of restriction products while regular potato chips + original soft drinks, chocolate fudge ice cream + chocolate coated granola bars, and

artisan French bread + smoked salmon flavoured cream cheese represented the bundle combinations of indulgence products. Choice for bundled products was based on 1) the market availability of a healthier version of the product (e.g., diet versus regular soft drinks) or in the product category (e.g., frozen yogurt versus ice cream) and 2) actual perception of products as a restriction or an indulgence product.

#### **4.1.2 Procedure**

A total of 116 undergraduate students from Concordia University participated in the study. Participants were blind to the research purpose and were told that the research objective was to evaluate different bundle offers. The study was carried out using a paper and pencil questionnaire. Order of presentation of the bundles was counter-balanced across participants. Participants were randomly assigned to one of the twelve counter-balanced bundle presentation orders. Participants were first presented with either the restriction or indulgence health goal manipulation. An adapted version of Poynor and Haws (2008, 2009) personal goal scenarios was used to manipulate restriction versus indulgence goals. In the restriction goal condition, participants were instructed to “imagine that they have decided that they really should be more careful about their health and reduce the amount of calories they consume in order to achieve their longterm health objectives”. Participants assigned to the indulgence goal condition were instructed to “imagine that they have decided that although their health is important, they really should enjoy life more by worrying less about the calorie content of food products they consume and more about the overall enjoyment of their life”. Following the goal manipulation, participants were asked to write three potential benefits of pursuing this particular objective. On the top of each of the following pages of the questionnaire, a photo of the

bundled products, information about product quantity and specification along with the bundle offer details for each bundle (i.e., the regular prices for each product as well as the total price of the bundle, which in this case corresponds to the sum of the regular prices for each product) was presented. In all product presentations, products were equally priced and no price discount was presented in order to isolate the impact of consumer's goal and to avoid any possible pricing effect on bundle evaluation. An example of the stimuli presentation format adopted in this study is presented in Appendix 1. Each bundle photo and description was followed by measures of perceived complementarity, bundle appeal, and willingness to buy, as well as how seriously participants took their assigned goal to be (manipulation check), and demographics. Measures of perceived complementarity and willingness to buy were the same as those used in study 2. Bundle appeal was measured with one seven-point item :“How appealing the bundle composed if products A and B is”.

## 4.2 Results

Goal manipulation checks suggested by Poynor and Haws (2009) were assessed. As expected, all 116 participants described potential benefits that were consistent with the manipulated goal, therefore suggesting that they have appropriately understood and considered their assigned goal. In addition, participants reported how seriously they took their assigned goal using the seven-point one item scale used by Poynor and Haws (2009) ranging from 1: “Not seriously at all” to 7: “Very seriously”. They provided ratings significantly higher than the scale midpoint ( $M_{\text{How seriously the goal was taken}} = 4.81$ ;  $t(115) = 6.56, p < .01$ ).

To test for the impact of consumer goals (i.e., restriction versus indulgence goal) on complementarity and bundle evaluation, six MANOVAs with perceived complementarity, bundle appeal, and willingness to buy serving as dependent variables were performed for the bundles composed of products from (1) snacks (Tostitos tortilla chips + Diet Pepsi-Cola; Lay's potato chips with Pepsi-Cola soft drinks), (2) desserts (i.e., Chapman's low fat frozen yogurt + Nature Path organic granola bars; Chapman's fudge chocolate ice cream + Quaker chocolate coated bars, and (3) appetizers (i.e., French bread + Fontaine Santé chickpea purée; Première Moisson French bread + Philadelphia smoked salmon cream cheese). For 5 out of the 6 MANOVAs (see Table 6), results showed a significant multivariate main effect of consumers' goals (at  $p < .05$ ). For the bundle of French bread with chickpea purée, results were also supportive, but only marginally significant ( $p < .10$ ).



**Table 6: Multivariate Main Effect of Consumer Goals on Bundle Perceived  
Complementarity, Bundle Appeal and WTB**

<b>Bundle</b>	<b>F statistic (Wilk's Lambda)</b>	<b>P-value</b>	<b>Effect size (<math>\eta^2</math>)</b>
Tortilla chips + diet soft drinks	F(3, 54)= 2.78	.05	.134
Potato chips + regular soft drinks	F(3, 54)= 5.30	<.01	.227
Low fat frozen yogurt + organic granola bars	F(3, 54)= 3.25	.03	.153
Chocolate ice cream + chocolate coated bars	F(3, 54)= 7.02	<.01	.281
French bread + chickpea purée	F(3, 54)= 2.21	.09	.109
French bread + cream cheese	F(3, 54)= 3.55	.02	.165

#### **4.2.1 Means Comparisons for Snacks**

As expected, there was a significant main effect of goal manipulation on perceived complementarity, bundle appeal, and willingness to buy. For the bundle of restriction attribute-related snacks (i.e., Tostitos multigrain tortillas chips + Diet Pepsi-Cola soft drinks), participants in the restriction goal condition reported higher perceived complementarity ( $M_{\text{Restriction}} = 5.00$  versus  $M_{\text{Indulgence}} = 3.94$ ;  $F(1, 56) = 7.60$ ,  $p < .01$ ), higher bundle appeal ( $M_{\text{Restriction}} = 4.66$  versus  $M_{\text{Indulgence}} = 3.66$ ;  $F(1, 56) = 4.12$ ,  $p < .05$ ), and higher willingness to buy ( $M_{\text{Restriction}} = 4.11$  versus  $M_{\text{Indulgence}} = 3.00$ ;  $F(1, 56) = 6.29$ ,  $p < .05$ ) than participants in the indulgence goal condition.

For the bundle of indulgence attribute-related snacks (i.e., Lay's potato chips + Pepsi-Cola regular soft drinks), participants in the indulgence goal condition reported higher perceived complementarity ( $M_{\text{Restriction}} = 4.02$  versus  $M_{\text{Indulgence}} = 5.12$ ;  $F(1, 56) = 7.95$ ,  $p = .01$ ), higher bundle appeal ( $M_{\text{Restriction}} = 3.31$  versus  $M_{\text{Indulgence}} = 5.31$ ;  $F(1, 56) = 15.15$ ,  $p < .01$ ), and higher willingness to buy ( $M_{\text{Restriction}} = 2.85$  versus  $M_{\text{Indulgence}} = 4.46$ ;  $F(1, 56) = 10.86$ ,  $p < .01$ ) than participants in the restriction goal condition.

#### **4.2.2 Means Comparisons for Desserts**

As expected, there was a significant main effect of goal manipulation on perceived complementarity, bundle appeal, and willingness to buy. For the bundle of restriction attribute-related desserts (i.e., Chapman's low fat frozen yogurt + Nature Path organic granola bars), participants in the restriction goal condition reported higher perceived complementarity ( $M_{\text{Restriction}} = 3.89$  versus  $M_{\text{Indulgence}} = 2.52$ ;  $F(1, 56) = 9.87$ ,  $p = .01$ ), slightly higher bundle value ( $M_{\text{Restriction}} = 4.93$  versus  $M_{\text{Indulgence}} = 4.17$ ;  $F(1, 56) = 2.03$ ,  $p = .16$ , non-significant), and higher willingness to buy ( $M_{\text{Restriction}} = 4.21$  versus  $M_{\text{Indulgence}} = 3.26$ ;  $F(1, 56) = 3.91$ ,  $p = .05$ ) than participants in the indulgence goal condition.

For the bundle of indulgence attribute-related desserts (i.e., Chapman's fudge chocolate ice cream + Quaker chocolate coated granola bars), participants in the indulgence goal condition reported higher perceived complementarity ( $M_{\text{Restriction}} = 1.85$  versus  $M_{\text{Indulgence}} = 3.80$ ;  $F(1, 56) = 16.01$ ,  $p < .01$ ), higher bundle appeal ( $M_{\text{Restriction}} = 3.79$  versus  $M_{\text{Indulgence}} = 5.52$ ;  $F(1, 56) = 9.97$ ,  $p < .01$ ), and higher willingness to buy ( $M_{\text{Restriction}} = 2.90$  versus  $M_{\text{Indulgence}} = 4.64$ ;  $F(1, 56) = 14.35$ ,  $p < .01$ ) than participants in the restriction goal condition.

### 4.2.3 Means Comparisons for Appetizers

As predicted, there was a significant main effect of goal manipulation on perceived complementarity, bundle appeal, and willingness to buy. For the bundle of restriction attribute-related appetizers (i.e., Première Moisson French bread + Fontaine Santé chickpea purée), participants in the restriction goal condition reported higher perceived complementarity ( $M_{\text{Restriction}} = 5.05$  versus  $M_{\text{Indulgence}} = 3.91$ ;  $F(1, 56) = 6.49$ ,  $p = .01$ ), higher bundle appeal ( $M_{\text{Restriction}} = 5.48$  versus  $M_{\text{Indulgence}} = 4.45$ ;  $F(1, 56) = 4.25$ ,  $p = .04$ ), and higher willingness to buy ( $M_{\text{Restriction}} = 4.77$  versus  $M_{\text{Indulgence}} = 3.76$ ;  $F(1, 56) = 4.42$ ,  $p = .04$ ) than participants in the indulgence goal condition.

For the bundle of indulgence attribute-related appetizers (i.e., Première Moisson French bread with Philadelphia smoked salmon cream cheese), participants in the indulgence goal condition reported higher perceived complementarity ( $M_{\text{Restriction}} = 4.35$  versus  $M_{\text{Indulgence}} = 5.40$ ;  $F(1, 56) = 5.16$ ,  $p = .03$ ), higher bundle appeal ( $M_{\text{Restriction}} = 4.72$  versus  $M_{\text{Indulgence}} = 6.00$ ;  $F(1, 56) = 7.69$ ,  $p < .01$ ), and higher willingness to buy ( $M_{\text{Restriction}} = 4.11$  versus  $M_{\text{Indulgence}} = 5.36$ ;  $F(1, 56) = 7.87$ ,  $p < .01$ ) than participants in the restriction goal condition.

## 4.3 Discussion

Study 3 results demonstrate the impact of consumer goals on bundle evaluation. Specifically, the results show that consumer goals and bundle composition can influence bundle evaluation in a predictable way. A strong fit between consumer goals (i.e., restriction and indulgence goals) and goal-related characteristics of the bundle (i.e., restriction versus indulgence product attributes) can increase consumers' perception of complementarity among the bundled products, perceived attractiveness of the bundle and

consumers' willingness to buy. Bundles composed of two products with restriction-related attributes were perceived as more complementary when evaluated by consumers under a restriction goal than by those under an indulgence goal. In contrast, bundles composed of two products with indulgence-related attributes were perceived as more complementary when evaluated by consumers under an indulgence goal than by those under a restriction goal.

This study illustrates that consumers' perception of complementarity in a bundling context is not always stable and is not only influenced by the functional relation between the bundle products. It highlights the malleability of complementarity perception and its contingency upon consumer goals. This notion of malleability has key implications for managers looking at designing attractive bundle offers. By positively influencing the perception that bundled products complement each other, managers can increase bundle attractiveness and consumers' willingness to buy. Accordingly, study 4 and 5 focus on contextual factors associated with the design of the bundle offer (i.e., image presentation format and price bundling strategy) that can affect complementarity perception and consequently, bundle value.

## **Chapter 5: Study 4: The Mediating Effect of Perceived Complementarity on the Relationship between Bundle Image Presentation and Willingness to Buy**

Study 3 results show that personal goals play an important role in consumers' perception of complementarity. In their everyday lives, consumers do not aim to satisfy one single goal but they usually pursue multiple goals and desires at the same time. These goals sometimes conflict with each other and pose a self-control dilemma. Such situations occur when one goal is high order and presents delayed but more important benefits, while another goal is low order and offers immediate but conflicting smaller benefits (Kivetz and Simonson 2002; Loewenstein 1996). For instance, an individual may pursue the high order goal of losing weight but he feels an immediate craving for a tempting chocolate cake. Past literature in the areas of goal conflict and self-regulation highlight the importance of prioritizing the different goals consumers wish to pursue and of adopting efficient strategies to resolve goal conflicts in order to effectively achieve several goals (Cantor and Langston 1989; Emmons and King 1988; Higgins 1989; Kruglanski et al. 2002; Markus and Ruvolo 1989).

To understand how consumers would evaluate a bundle composed of products that are associated with conflicting goals (e.g., a healthy and an unhealthy product) is a crucial managerial and theoretical question. Would consumers perceive that (a) these products go together and complete each other because they are associated with different goals or would they perceive that (b) these products do not go together because one bundled product (e.g., unhealthy temptation product) is detrimental to the attainment of the goal associated with the other bundled product (e.g., healthy goal product)? Based on

the two-stage model of conflict identification and conflict resolution proposed by Myrseth and Fishbach (2009), it is proposed here that perception of bundle complementarity would be affected by contextual factors that either highlight or reduce perception of goal conflict between the two bundled products. The two-stage model of Myrseth and Fishbach (2009) suggests that consumers evaluating a tempting option had to determine first whether there is a conflict between indulging versus pursuing more important long-term goals (stage 1). The model proposed that consumers would implement various self-control strategies (i.e., favour goal-pursuit over indulgence) if and only if they identify a conflict between both products (stage 2).

Among the environmental cues that can influence goal conflict identification, the image presentation format of the evaluated alternatives has been described as a key factor. The findings of Fishbach and Zhang (2008) showed that the manner in which the alternatives associated with goal and temptation are presented is likely to influence the adoption of either a balancing dynamic of goal and temptation *or* of a highlighting of the long-term goal. Implicitly assuming that all consumers have an inherent long-term goal of health consciousness, the authors have shown participants either (1) a long-term goal product (e.g., in study 1: strawberries) and a temptation product (e.g., in study 1: a soft drink) presented on separate images or (2) both long-term goal and temptation products (e.g., both strawberries and the soft drink) presented side by side on the same image. When the long-term goal and the temptation product images were presented separately, the products appeared as conflicting and a choice sequence that highlighted the healthy eating goal was induced. The long-term goal and the temptation products then appeared to compete against each other (i.e., people had to choose one or the other), as the health

consciousness goal was highlighted. On the other hand, when the long-term goal and the temptation product were presented together in the same image, a balancing between goal and temptation occurred. When the products were presented in the same image, the long-term goal and the temptation products appeared to complement each other. This image presentation format induced a balancing choice sequence where individuals could consume the temptation product now and balance with the healthy eating goal later.

Many bundled products are promoted in online or paper flyers accompanied by the photos of the products. It is expected that when a product associated with a long-term goal (i.e., goal product) is offered in the same bundle with a product that compete with that long-term goal (i.e. temptation product), presenting these two products under the same image presentation format, which drives a balancing dynamic, would result in a higher perceived complementarity than the separate images presentation format, which triggers a highlighting dynamic. In a highlighting situation, consumers are focused on avoiding the tempting product, which would reduce perceived product complementarity for a bundle composed of one goal and one temptation product. This is expected to lead to higher willingness to purchase the bundle when the same image presentation format is adopted than when a separate images format is used.

**H3: Presenting one long-term goal product and one temptation product on the same image rather than on separate images increases consumers' willingness to purchase the bundle. This effect is mediated by perceived complementarity of the bundled products.**

The purpose of study 4 is to investigate whether the image presentation format of the bundled products influences perceived complementarity between these products and consequently affects bundle evaluation. If the image presentation has an impact on consumers' willingness to purchase the bundle and if this relationship is mediated by perceived complementarity of the bundled products, then there would be clear implications for marketing managers in promoting their bundles accordingly to increase perceived complementarity and therefore, product sales.

## **5.1 Methodology**

### **5.1.1 Stimuli and Design**

A pretest was run prior to study 4 in order to create bundles that fit the long-term (i.e., health) and temptation goal product combinations needed for this study. A total of 36 university students rated four products (chocolate chips cookies, Omega 3 milk, soft drinks and multigrain tortillas chips) on a 7-point scale ranging from 1 (very unhealthy) to 7 (very healthy) in a paper and pencil questionnaire. The Omega 3 milk was perceived as being healthier ( $M = 6.14$ ) than the chocolate chips cookies ( $M = 2.36$ ,  $t(35) = 13.82$ ,  $p < .01$ ). The multigrain tortillas chips were perceived as being healthier ( $M = 4.08$ ) than the soft drinks ( $M = 1.65$ ,  $t(35) = 14.19$ ,  $p < .01$ ). Based on these pretest results, the two bundles developed for study 4 are: (1) chocolate chips cookies + Omega 3 milk and (2) soft drinks + multigrain tortillas chips. In each bundle, the first product is a temptation product and the second is a health goal product.



Study 4 design was 2 (image presentation format: same versus separate images) × 2 (bundles: salty versus sweet snack combinations), where image presentation format was a between-subjects factor and the product bundle was a within-subjects factor. Two separate bundles were included to increase generalizability and no main nor interaction effects of the within-subjects factor are expected. In all product presentations, products were equally priced and no price discount was presented in order to isolate the impact of image presentation and to avoid any possible pricing effect on bundle value.

### **5.1.2 Procedure**

Eighty nine undergraduate students from Concordia University participated in study 4. Participants were blind to the research purpose and were told that the research objective was to evaluate different bundle offers. The study was carried out using a paper and pencil questionnaire. Participants were randomly assigned to one of the two versions of the questionnaire. A photo of the bundled products, information about product quantity and specification along with the bundle offer details for each bundle (i.e., the regular prices for each product as well as the total price of the bundle, which in this case corresponds to the sum of the regular prices for each product) was presented on the top of each page of the questionnaire. An example of the stimuli presentation adopted in this study for each of the same versus separate images conditions is presented in Appendixes 2A and 2B. Each bundle photo and description was immediately followed by measures of perceived complementarity, willingness to buy, and demographics.

## 5.2 Results

Means and standard deviations (SD) for each experimental condition of study 4 are presented in Table 7.

**Table 7: Descriptive Statistics for Perceived Complementarity and WTB across Image Presentation Formats**

<b>Impact of Image presentation</b>	<b>Means (SD) for same image presentation (N= 51)</b>	<b>Means and (SD) for separate images presentation (N=50)</b>
<i>Impact of image presentation on perceived complementarity</i>		
Bundle 1 (milk + cookies)	5.11 (1.30)	4.45 (1.34)
Bundle 2 (tortilla chips + soft drinks)	4.22 (1.36)	3.70 (1.66)
<i>Impact of image presentation on WTB</i>		
Bundle 1 (milk + cookies)	4.90 (1.36)	4.23 (1.66)
Bundle 2 (tortilla chips + soft drinks)	3.92 (1.81)	3.17 (1.71)

Mediation analyses using Preacher and Hayes (2004) bootstrapping procedures for indirect effects were conducted to test for the hypothesis that perceived complementarity mediates the relationship between image presentation format and consumers' willingness to buy the bundle. Bootstrapping is a non-parametric resampling technique for assessing indirect effects (Preacher and Hayes 2004; Preacher, Rucker, and Hayes 2007).

A mediation model was developed for each bundle (i.e., one for the milk + cookies bundle and another model for the tortillas chips + soft drinks bundle). Confidence intervals of indirect effects were estimated using 5000 bootstrap resamples (Preacher and Hayes 2008). Significant results are found when zero is not contained within the 95% confidence intervals.

As expected, for the bundle of milk + cookies, the total effect of image presentation format on willingness to buy was significant ( $c = -0.67$ ,  $t(88) = -2.09$ ,  $p = .04$ ), but the direct effect of image presentation format on willingness to buy was not ( $c' = -0.29$ ,  $t(88) = -1.01$ ,  $p = .31$ ). In addition, the total indirect effect through the mediator was significant, with a point estimate of  $-0.38$  and a 95% confidence interval of  $-0.79$  to  $-0.05$ . As predicted, these results indicate that perceived complementarity fully mediates the effect of image on willingness to buy.

For the bundle of tortillas chips + soft drinks, the total effect of image presentation format on willingness to buy was significant ( $c = -0.75$ ,  $t(88) = -2.01$ ,  $p = .05$ ), but the direct effect of image presentation format on willingness to buy was not ( $c' = -0.50$ ,  $t(88) = -1.44$ ,  $p = .15$ ), thus suggesting that perceived complementarity fully mediates the effect of image presentation on willingness to buy. However, the total indirect effect through the mediator was not significant, with a point estimate of  $-0.25$  and a 95% confidence interval of  $-0.62$  to  $0.05$ .

In order to further examine whether perceived complementarity mediates the impact of bundle image presentation format on consumers' willingness to buy the bundle, a structural equations model was developed for each of the two bundles. When testing mediation effects, simultaneous comparison of the direct and indirect effects within one

structural model is recommended (see James, Mulaik, and Brett 2006). Therefore, one model was estimated for each bundle (i.e., one for the bundle of milk with cookies and another for the bundle of tortillas chips with soft drinks).

For each model, the independent variable was dummy-coded as 0 (i.e., same image presentation format) or 1 (separate images presentation format). Perceived bundled products' complementarity and willingness to buy were the dependant variables. As expected, the structural equations models results (see Table 8) suggest that the impact of the image presentation format on willingness to buy is *fully* mediated by perceived complementarity of bundled products for both bundles (i.e., Omega 3 milk with chocolate chips cookies and tortillas chips with soft drinks). Specifically, both the direct and indirect effects in the structural equations models were compared to test for mediation. For both models, the indirect path from the independent (i.e., image presentation format) to the final dependent variable (i.e., consumers' willingness to buy) was significant and the direct path between those two constructs was non-significant, therefore showing evidence for full mediation (see Shrout and Bolger 2002).

**Table 8: Mediational Analysis Results for Study 4**

	<u>Total Indirect Effect</u>		<u>Direct Effect</u>		<b>Evidence of mediation</b>
	Estimate	t-Value	Estimate	t-Value	
<b>Model 1: Bundle of milk with cookies</b>					
<b>Image presentation format – Willingness to buy</b>	-4.36*	-2.20	.58	.36	<b>Full mediation</b>
<b>Image presentation format – Perceived complementarity</b>			-3.52*	-3.72	
<b>Perceived complementarity -- Willingness to buy</b>			1.24*	3.52	
<b>Model 2: Bundle of tortillas chips with soft drinks</b>					
<b>Image presentation format – Willingness to buy</b>	-1.05*	-3.30	.12	.73	<b>Full mediation</b>
<b>Image presentation format – Perceived complementarity</b>			-1.20*	-3.38	
<b>Perceived complementarity -- Willingness to buy</b>			.88*	12.32	

\*p < .05 (two-tailed).

### 5.3 Discussion

Study 4 demonstrates that image presentation format (i.e., same versus separate images presentation of bundled products) influences consumers' bundle evaluation, therefore confirming H3. Specifically, study 4 results suggest that cues favoring goal conflict identification (e.g., when products are presented on separate images instead of the same image) are likely to decrease perceived complementarity and consequently bundle appeal and willingness to buy for an offer composed of one long-term goal product and one temptation product. Under the separate images format, consumers are likely to perceive that products do not complement each other because they are associated

with conflicting goals. Thus, perception of goal incompatibility is likely to have highlighted the importance and priority of the higher-order goal (e.g., staying healthy) while inhibiting the competing lower-order goal (e.g., indulge themselves with a delicious but highly caloric dessert) (Shah, Friedman, and Kruglanski 2003) .

This study is the first to explore the impact of image presentation format on bundle evaluation through perceived complementarity between bundled products. It illustrates that the same combination of products can result in different perception of products' complementarity and willingness to buy the bundle depending on image presentation format, a superficial characteristic that influences self-conflict identification.

## **Chapter 6: Study 5: The Impact of Pricing Strategy and Image Presentation Format on Perceived Complementarity and Bundle Evaluations**

In study 4, no price discounts were associated with the bundle offers in order to test for the impact of image presentation format on bundle evaluation in a context of bundles composed of one long-term goal product (i.e., healthy) and one temptation product (i.e., unhealthy). Given that most bundles in the marketplace are typically framed with a price discount, it would be managerially relevant to examine whether applying the price discount on the long-term goal product or on the temptation product differentially impacts the attractiveness of the bundle and whether this effect is the same across image presentation formats.

The current study specifically investigates whether price bundling strategy (i.e., mixed-leader strategy with price discount applied on the long-term goal product versus mixed-leader strategy with price discount applied on the temptation product) moderates the mediation effect observed in study 4, namely the mediation role of perceived complementarity between image presentation format and bundle value.

### **6.1 Price Bundling**

Price bundling related issues have received a considerable amount of attention in the marketing literature (e.g., Guitinan 1987; Soman and Gourville 2001; Yadav and Monroe 1993). This promotional strategy refers to the selling of bundles of products for a special price (Guitinan 1987; Stremersch and Tellis 2002) in order to create value for

consumers (Stremersch and Tellis 2002). The wide use of price bundling in numerous markets underlines the importance of investigating the factors influencing the perceived attractiveness of a price discount in a bundling context. A critical question in price bundling is to assess the impact of assigning the discount to one particular product (i.e., adopting a mixed-leader strategy) in the bundle on consumers' perception of price discount attractiveness (see Janiszewski and Cunha 2004; Kaicker, Bearden, and Manning 1995; Mazumdar and Jun 1993). For instance, it has been demonstrated that discounts are more effective when assigned to the product in the bundle that consumers value the most (Kaicker, Bearden, and Manning 1995; Mazumdar and Jun 1993; Yadav 1995). Moreover, Janiszewski and Cunha (2004) show that the attractiveness of the discount in a bundling context depends on a particular price reference point. They found that a bundle discount is perceived as more attractive when applied to the product which regular price was higher than consumers' reference price than when this same amount of bundle discount was applied to the product which regular price was lower than its reference price. While these two models-Janiszewski and Cunha's (2004) reference-dependent model and Yadav's (1995) weighted-additive model-significantly contribute to the understanding of consumers' evaluation of mixed-leader pricing strategy in a bundling context, they do not account for the potential interaction between the pricing strategy and bundle composition in terms of the goal-relevant attributes associated with each of the bundled products.



## 6.2 Goal Progress and Goal Commitment

Recent literature on self-regulation suggests that individuals “represent goal actions in terms of either progress toward a desirable end state or commitment to this end state” (Fishbach 2009, p 167). When individuals are in a dynamic of progress representation of goals, they are oriented toward adopting actions that are likely to reduce the discrepancy between their existing undesirable state and their desired state. This process refers to a “balancing” dynamic, a self-regulation pattern where the success in accomplishing steps toward the goal signals that efforts toward pursuing this goal should be reduced while the failure in making these steps induces an increase in the efforts at the next occasion for accomplishing this goal. On the other hand, when individuals are in a dynamic of commitment representation of goals, they associate undertaking goal-congruent actions with high goal commitment. Under this representation of goals, goal-congruent actions demonstrate a strong commitment, a high goal value, and a significant probability to reach that goal. The activated self-regulatory dynamic is called “highlighting”. It refers to a process where the success in moving toward accomplishing one goal makes it more important and motivates individuals to undertake other goal-congruent actions to pursue this same goal.

It is proposed here that a price discount strategy applied either on the goal or on the temptation product is likely to interact with the image presentation format and have differential impacts on bundle value depending on whether consumers focus on cues related to goal progress (i.e., under a balancing dynamic induced by the same image presentation format) or on cues suggesting goal commitment (i.e., under a highlighting dynamic induced by the separate images presentation format).

Fishbach and Zhang (2008) suggested that presenting products under the same image presentation format is likely to induce a balancing dynamic since products appear to complete each other and consequently make consumers sensitive to information signaling goal progress. Under a balancing dynamic, individuals are expected to alternate between the high-order goal and the low-order temptation. In addition, individuals are likely to focus first on the short-term goal (i.e., temptation) because it offers immediate benefits and later move to the neglected long-term goal that provides delayed benefits (Loewenstein 1996; Mischel and Ayduk 2004; Rachlin 2000). Therefore, consumers are likely to be concerned with progressing toward the achievement of the temptation goal first, before focusing on the pursuit of the long-term goal. Accordingly, any information suggesting that progress has been made toward the particular pursuit of the temptation goal is likely to serve as a justification for moving the other neglected long-term goal (Fishbach and Dhar 2005).

It is argued here that, under a balancing dynamic (i.e., products presented under the same image format), a price discount is likely to be interpreted as a goal progress since it signals that less effort (i.e., reduced monetary sacrifice) is now required to achieve a particular goal. Thus, when a price discount is applied to the temptation product, consumers are likely to perceive that progress have been made toward the pursuit of the important short-term goal (i.e., temptation) and the individual can now move to the neglected long-term goal. On the opposite, when a price discount is applied to the long-term goal product, consumers are likely to perceive that no progress has been made toward the pursuit of the important short-term goal and the individual is less likely to focus on other goals (i.e., the neglected long-term goal). Therefore, compared to when

a price discount is applied to the long-term goal product, applying the discount to the temptation product in a same image presentation is expected to yield higher perceived complementarity, and consequently a higher bundle value.

**H4: When presented under same image format, a price discount applied on the temptation product will lead to (a) higher perceived complementarity and (b) higher willingness to buy than an equivalent price discount applied to the long-term goal product.**

As described by Fishbach (2009), the dynamic of highlighting a single goal leads to a different representation of goals. Specifically, under such a dynamic, individuals represent goal actions in terms of commitment toward a desirable end-state (e.g., being healthy). Goal commitment has been defined as a subjective sense that the goal is valuable and that the expectancy of its attainment is high (Cialdini, Trost, and Newsom 1995; Fishbach 2009). When consumers feel unsure about their level of commitment toward a particular goal, their primary concern is to evaluate whether the goal is important to them and worth pursuing further. When products are presented under separate images format, they are perceived as competing with each other. Consequently, the long-term goal is highlighted and the short-term goal (i.e., temptation) is inhibited. It is argued here that, under a highlighting dynamic, price and associated price discount will be interpreted by consumers as an indicator of how valuable is the pursued goal.

When the product associated with a long-term goal is offered at a regular price, consumers are likely to perceive that this specific goal (e.g., health goal) is more valuable than when this same product is offered at a discounted price. In addition, this

long-term goal product is associated with a temptation product that can also be offered at a regular or a discounted price. For example, when evaluating a bundle composed of a bag of tortillas chips with soft drinks where both products in the bundle have equivalent regular prices, a mixed-leader offer will create a situation where either the long-term goal or the temptation product will become more expensive than the other. Consequently, in relative terms, a mixed-leader price discount is likely to affect relative perception of which product (and accordingly the goal associated with this product) is more valued by consumers (i.e., the long-term goal should be more valued if the price discount is applied on the temptation product or the temptation goal should be more valued if the price discount is applied on the goal product). Paying the regular price is interpreted as a signal of goal commitment, therefore inhibiting the other competing goals, while getting a discount on the long-term goal product is a signal of the lesser importance attributed to the long-term goal, therefore reducing goal conflict with the temptation product and enhancing bundled products' perceived complementarity.

In sum, compared to when a price discount is applied on the temptation product, applying the discount on the long-term goal product in a separate images presentation format would lead to higher perceived complementarity, and consequently a higher bundle value.

**H5: When presented under separate images format, a price discount applied on the long-term goal product will lead to (a) higher perceived complementarity and (b) higher willingness to buy than an equivalent price discount applied to the temptation product.**

### **6.3 Methodology**

A 2 (image presentation format: same image versus separate images) × 2 (price bundling strategy: mixed-leader on the long-term goal product versus mixed-leader on the temptation product) between-subjects factorial design was adopted.

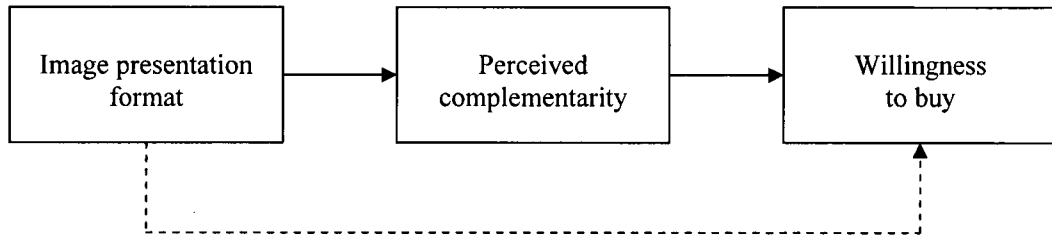
A total of 129 undergraduate students from Concordia University participated in study 5. Participants were blind to the research purpose and were told that the research objective was to evaluate different bundle offers. They completed the paper and pencil questionnaire in a classroom environment and they were randomly assigned to each of the four different versions of the questionnaire. A photo of the bundled products (tortilla chips + soft drinks), information about product quantity and specification along with the bundle offer details for each bundle (i.e., the regular prices for each product as well as the percentage off) was presented on the top of each page of the questionnaire. An example of the stimuli presentation format (i.e., mixed-leader on the long-term goal product versus mixed-leader on the temptation product) adopted in this study is presented in Appendixes 3A and 3B. Each bundle photo and description was immediately followed by measures of perceived complementarity, willingness to buy, and demographics used in former studies.

### **6.4 Results**

#### **6.4.1 Mediation Models**

Mediation models (Figure 2) were developed using multiple regressions following Baron and Kenny (1986) and Frazier, Tix, and Baron (2004). First, the direct impact of image presentation format on willingness to buy (outcome variable) has been

investigated (step 1). Second, image presentation format has been correlated with perceived complementarity (the mediator), which is considered as a predictor (step 2). Finally, the relationship between image presentation format, perceived complementarity (the mediator) and willingness to buy (outcome variable) has been demonstrated (step 3).



**Figure 2: Mediational Models for Study 5**

Mediational analyses results for each pricing strategy are presented in Tables 9 (for price discount applied on the long-term goal product) and 10 (for price discount applied on the temptation product). In order to undertake these analyses, perceived complementarity ( $\alpha = .83$ ) and willingness to buy ( $\alpha = .95$ ) were averaged to create composite measures of each construct.

**Table 9: Pricing Strategy A: Applying the Price discount on the Long-Term Goal**

**Product**

Testing steps in mediation model	Unstandardized $\beta$	T-values	Standardized $\beta$
<i>Testing Step 1</i> Outcome: WTB Predictor: Image presentation format <sup>a</sup>	1.03	2.62*	.34
<i>Testing Step 2</i> Outcome: Perceived complementarity Predictor: Image presentation format	.87	2.93**	.37
<i>Testing Step 3</i> Outcome: WTB Mediator: Perceived complementarity Predictor: Image presentation format	.91 -	7.04** .87	.69 .09

a: 0=same image ; 1=separate images

\* p < .05

\*\* p < .01

Mediational analyses (Table 9) show that perceived complementarity fully mediates the relationship between image presentation format and willingness to buy the bundle, when the price discount is applied on the long-term product (Sobel  $z = 2.70$ ,  $p < .01$ ). When the price discount is applied on the long-term goal product (i.e., Tostitos Multigrain chips), presenting the bundled products in separate images (i.e., highlighting) increases perceived complementarity of bundled products, therefore enhancing consumers' willingness to buy the bundle.

**Table 10: Pricing Strategy B: Applying the Price discount on the Temptation**

**Product**

Testing steps in mediation model	Unstandardized $\beta$	T-values	Standardized $\beta$
<i>Testing Step 1</i> Outcome: WTB Predictor: Image presentation format <sup>a</sup>	-.92	-2.33*	-.28
<i>Testing Step 2</i> Outcome: Perceived complementarity Predictor: Image presentation format	-.84	-2.50*	-.30
<i>Testing Step 3</i> Outcome: WTB Mediator: Perceived complementarity Predictor: Image presentation format	.75 -	6.62** -0.96	.64 -.10

a: 0=same image ; 1=separate images

\* p < .05

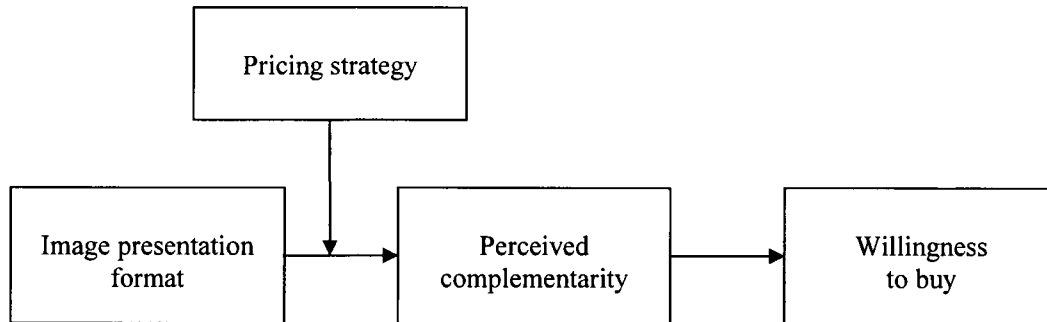
\*\* p < .01

Mediational analyses (see Table 10) demonstrated that perceived complementarity fully mediates the relationship between image presentation format and willingness to buy the bundle, when the price discount is applied on the temptation product (Sobel  $z = -2.33$ ,  $p = .02$ ). As expected, when the price discount is applied on the temptation product (i.e., Coca-Cola soft drink), presenting the bundled products in the same image (i.e., balancing) increases perceived complementarity of bundled products, therefore enhancing consumers' willingness to buy the bundle.



#### **6.4.2 Moderated Mediation**

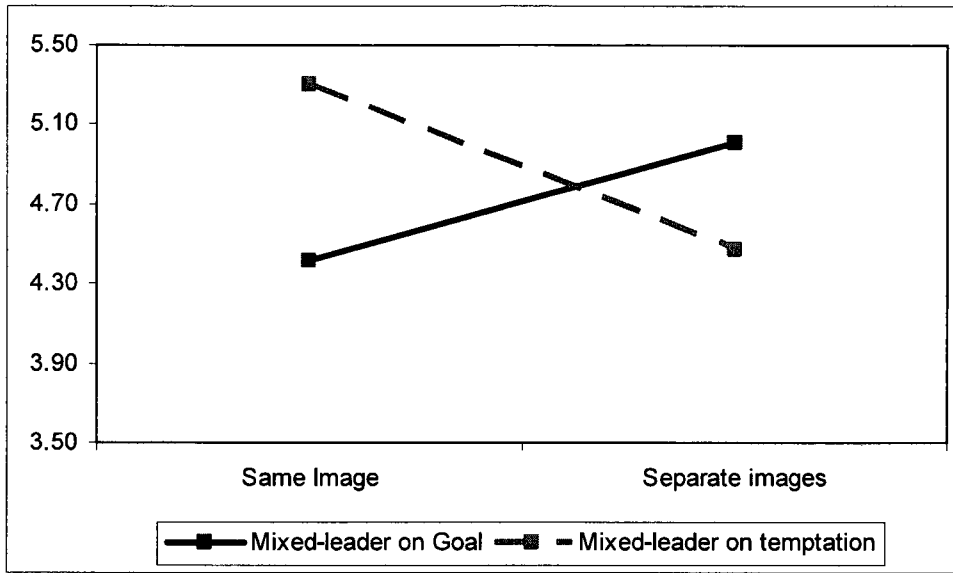
After demonstrating the mediational role of perceived complementarity on the relationship between image presentation and willingness to buy for both pricing strategies, a parsimonious model of moderated mediation was developed. This model allows testing two assumptions in one model: (a) image presentation format influences consumers' willingness to buy through perceived complementarity (mediation), and (b) the positive/negative valence of the image presentation-perceived complementarity association depends on the pricing strategy (i.e., on applying price discount on the long-term goal product or on the temptation product). The moderated mediation model (Figure 3) was developed using bootstrapping method with 5000 bootstrap resamples. Given that exact normal distribution is only found in large samples, using bootstrapping when testing moderated mediation overcomes several problems that may arise with non-normally distributed variables (like power problems, for instance) (Preacher and Hayes 2004; Preacher, Rucker, and Hayes 2007).



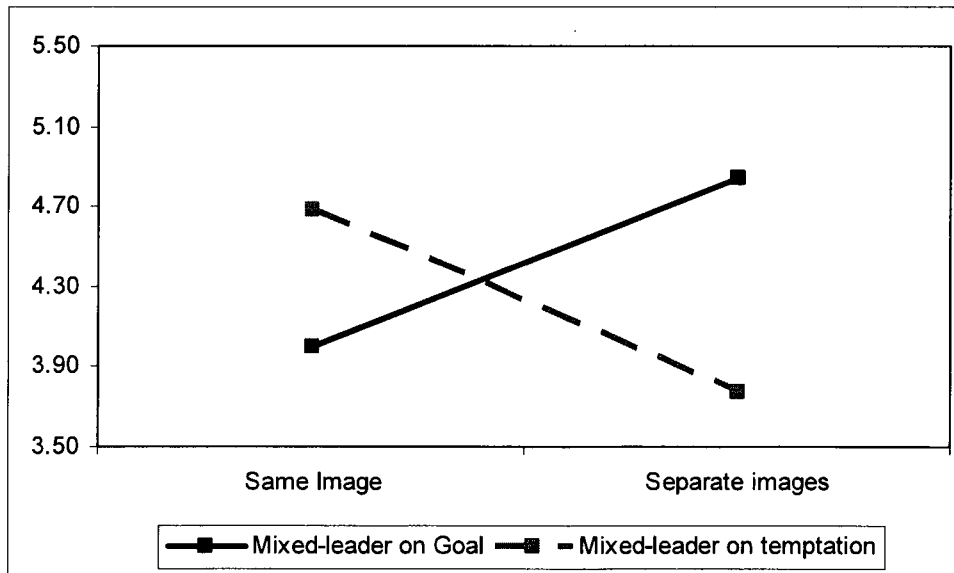
**Figure 3: Moderated Mediation Model for Study 5**

Following Preacher and Hayes (2004) and Preacher, Rucker, and Hayes (2007), the moderated mediation hypothesis was tested using multiple regression analyses with 5000 bootstrapped resamples. The significant interaction effect (image presentation format  $\times$  pricing strategy:  $\beta = -1.75$ ,  $p < 0.01$ ) demonstrate the moderating effect of pricing strategy in the impact of image presentation on perceived complementarity. Corroborating the results of the mediation analyses, the conditional indirect effects of image presentation format on willingness to buy through perceived complementarity was significant for both pricing strategies. These effects were positive ( $\beta = .73$ ,  $z = 2.53$ ,  $p = .01$ ) for pricing strategy A (price discount applied on the long-term goal product) and negative ( $\beta = -.73$ ,  $z = -2.65$ ,  $p < .01$ ) for pricing strategy B (price discount applied on the temptation product).

Figures 4 and 5 illustrate the combined effects of pricing strategy and image presentation format on perceived complementarity and willingness to buy.



**Figure 4: The Impact of Pricing Strategy and Image Presentation Format on Perceived Complementarity**



**Figure 5: The Impact of Pricing Strategy and Image Presentation Format on WTB**

In sum, these results demonstrate that when products are presented in separate images applying the price discount on the goal product is more effective. On the contrary, when products are presented in the same image, applying the price discount on the temptation product provide higher perceived value to the bundle.

### **6.4.3 Alternative Explanations**

#### **6.4.3.1 Reference-Dependent Model**

According to the reference-dependent model proposed by Janiszewski and Cunha (2004), the perceived value of a discount is influenced by a consumer's reference price for each product included in the bundle. Specifically, the model predicts that a price discount will have a higher positive impact on bundle evaluation if it is applied on a product that is priced higher than a consumer's reference price compared to an identical price discount applied on a product priced lower than a consumer's reference price. In the context of study 5, the reference-dependent model would predict that (1) applying the price discount on the goal or temptation products will not affect perceived complementarity, and (2) the effectiveness of the price discount in increasing willingness to buy will not vary across image presentation formats, but will instead be determined by the comparison between a consumer's reference prices of the products and prices of the products in the bundle offer.

To be able to test this alternative explanation, the reference prices for each product in dollars and in cents were obtained prior to presentation of the bundles using open-ended questions. The results suggested that (1) applying the price discount on the long-term goal or the temptation products lead to differences in perceived

complementarity and consequently higher willingness to buy, depending on the image presentation format, while (2) respondents' reference prices were equal across image presentation format conditions in the current study (for the tortillas chips ( $M_{\text{Same Image}} = 3.30$  versus  $M_{\text{Separate Images}} = 3.25$ ;  $t(126) = .263$ ,  $p = .79$ ) and for the soft drinks ( $M_{\text{Same Image}} = 5.18$  versus  $M_{\text{Separate Images}} = 5.87$ ;  $t(125) = -1.57$ ,  $p = .12$ ). Therefore, the shift in the effectiveness of the mixed-leader strategy observed in study 5 cannot be explained by the reference-dependent model.

#### **6.4.3.2 Weighted-Additive Model**

Bundling literature suggests that the evaluation of a bundle offer significantly varies depending on which item is featured as the price leader (i.e., on which item in the bundle the price discount is applied). Yadav (1994; 1995) argued that consumers evaluate bundled products sequentially, starting first with the most preferred or desirable product and making adjustments based on their evaluation of the other products included in the bundle afterwards. Using his weighted-additive model, Yadav (1995) showed that the impact of a price discount on the overall evaluation of the bundle will be greater when the discount is applied on the most preferred product in the bundle.

In order to test this alternative explanation, consumers' preference for each product in the bundle was measured using the following question: "Which item in this bundle do you prefer?" with endpoints 1 = I prefer Tostitos chips more, 7 = I prefer Pepsi-Cola soft drinks more. Results showed that preferences for bundle items did not vary significantly across image presentation format conditions ( $M_{\text{Same Image}} = 3.02$  versus  $M_{\text{Separate Images}} = 3.65$ ;  $t(127) = 3.21$ ,  $p = .08$ ). In addition, for our results to be coherent with Yadav's model, the analyses should have yielded:  $M_{\text{Same Image}} > M_{\text{Separate Images}}$  instead

of the opposite results reported here. Therefore, weighted-additive model does not account for the shift observed in price discount effectiveness in study 5.

## **6.5 Discussion**

Overall, study 5 results suggest that when a price discount is applied to an individual product (i.e., mixed-leader strategy) in a bundle composed of a long-term goal product and a temptation product, the perceived value of the discount is influenced by image presentation format. Specifically, when products were presented under the same image, participants attributed more value to an equivalent discount when it was applied on the temptation product than when applied on a long-term goal product, as expected in H4. On the contrary, applying a price discount on the long-term goal product was more effective when products were presented under a separate images format than applying an equivalent discount on the temptation product, as expected in H5. These results can be explained by the fact that a price discount applied on a long-term goal (temptation) product increases (decreases) the level of goal conflict existing among the bundled products, and as a result decreasing (increasing) consumers' perception of bundled products' complementarity. These results suggest that bundle composition and image presentation format are two critical elements to consider in order to understand and to accurately anticipate the influence of price discount framing effect on bundle value.

## **Chapter 7: Study 6: Boundary Conditions to the Mediating Role of Perceived Complementarity in the Relationship between Image Presentation Format and Bundle Value**

In study 4, results showed that presenting a bundle composed of a long-term goal product and a temptation product under the same image leads to higher perceived complementarity and bundle value than presenting the bundle under a separate images format. This result has been explained by Fishbach and Zhang's (2008) argument suggesting that presenting two products (i.e., a long-term goal and a temptation) under a same image format make people perceive them as complementing each other while presenting them under separate images make people view the two products as competing with each other. The purpose of study 6 is to investigate the impact of restriction and indulgence goals as boundary conditions in the impact of image presentation of the bundled products on perceived complementarity and bundle evaluation demonstrated in study 4.

### **7.1 Restriction Goal**

When presented with a goal that would justify self-control (i.e., restriction goal), consumers are more likely to identify self-control conflict between the long-term goal and the temptation product (i.e., stage 1 of the Myrseth and Fishbach (2009) model). The impact of image presentation format identified in study 4 is therefore expected to disappear in such context since consumers would be more likely to exert self-control in an attempt to avoid temptation products under both same and separate images formats,

therefore having similar complementarity perception in both presentation formats. As a result, the level of perceived complementarity between the long-term goal and the temptation product is expected to be similar for both same and separate images presentation formats. The significant impact of image presentation format on perceived complementarity and willingness to buy of both bundles observed in study 4 is also likely to no longer exist under the restriction goal condition.

**H6: Under a restriction goal, image presentation format will not significantly influence (a) perceived complementarity and (b) consumers' willingness to buy the bundle.**

## 7.2 Indulgence Goal

When presented with a goal that would justify self-gratification (i.e., indulgence goal), consumers would no longer identify a self-control conflict between the long-term goal and the temptation product (i.e., Stage 1 of the Myrseth and Fishbach (2009) model). The impact of image presentation format reported in study 4 is likely to disappear since consumers will be less likely to exert self-control under the separate images presentation format, in an attempt to avoid temptation products. This is likely to lead to similar complementarity perception under both image presentation formats. As a result, it is expected here that the level of perceived complementarity between the long-term goal and temptation products would be similar for both same and separate images presentation format. The impact of image presentation format on both bundled products' perceived complementarity and willingness to buy observed in study 4 is also expected to no longer be significant under the indulgence goal condition.



**H7: Under an indulgence goal, image presentation format will not significantly affect (a) perceived complementarity and (b) consumers' willingness to buy the bundle.**

The objective of study 6 is to demonstrate that both restriction and indulgence goals act as key boundary conditions in the mediating effect of perceived complementarity in the relationship between image presentation formats and willingness to buy the bundle (i.e., the model tested in study 4).

## **7.3 Methodology**

### **7.3.1 Design**

A 2 (image presentation format: same image versus separate images) × 2 (goals: restriction versus indulgence) between-subjects design was used. For the same reasons presented in study 4, no price discount was presented. Three bundles were used as stimuli: multigrain tortilla chips + soft drinks, Omega 3 milk + cookies, and organic carrots + vegetable dip combination.

### **7.3.2 Pretest**

The pretest undertaken prior to study 4 ( $n = 36$ ) to create bundles that fit the long-term (i.e., health) and temptation goal product combinations required showed that Omega 3 milk was perceived as healthier ( $M_{\text{Milk}} = 6.14$ ) than the chocolate chips cookies ( $M_{\text{Cookies}} = 2.36$ ,  $t(35) = 13.82$ ,  $p < .01$ ). The multigrain tortillas chips were perceived as healthier ( $M_{\text{Chips}} = 4.08$ ) than the soft drinks ( $M_{\text{Soft drinks}} = 1.65$ ,  $t(35) = 14.19$ ,  $p < .01$ ). Another pretest was done for the carrots + dip combination using the same procedure as

in the study 4 pretest. Thirty six university students rated the products (organic carrots and vegetable dip) on a 7-point scale ranging from 1 (very unhealthy) to 7 (very healthy) in a paper and pencil questionnaire. The organic carrots were perceived as healthier ( $M_{\text{Carrots}} = 6.44$ ) than the vegetable dip ( $M_{\text{Dip}} = 3.17$ ,  $t(35) = 9.86$ ,  $p < .01$ ). As expected, these pretests have shown that for each bundle used, each health goal product (respectively Omega 3 milk, organic carrots, multigrain tortilla chips) was perceived as healthier than the temptation product (respectively cookies, vegetable dip, soft drinks) it was bundled with.

### **7.3.3 Procedure**

148 undergraduate students from Concordia University participated in study 6. Participants were blind to the research purpose and were told that the research objective was to evaluate different bundle offers. The study was carried out using a paper and pencil questionnaire. Order of presentation of the bundles was counter-balanced across participants. Participants were randomly assigned to one questionnaire version. Participants were first presented with the goal manipulation (either restriction or indulgence health goal manipulation, similar to study 3). Following Poynor and Haws (2008; 2009), participants were asked to write three potential benefits of pursuing this particular objective after the the goal manipulation. This question was used as a goal manipulation check to ensure that participants appropriately interpreted and considered their assigned goal. On the following pages, a photo of the bundled products, information about product quantity and specification along with the bundle offer details for each bundle (i.e., the regular prices for each product as well as the total price of the bundle, which in this case corresponded to the sum of the regular prices for each product) was

presented. Each bundle photo and description was immediately followed by measures of perceived complementarity, willingness to buy, and demographics.

#### 7.4 Results

Goal manipulation checks suggested by Poynor and Haws (2009) were assessed. As expected, all 148 participants described potential benefits that were consistent with the manipulated goal, suggesting that they have appropriately understood and considered their assigned goal. In addition, participants generally took their assigned goal seriously, providing ratings significantly higher than the scale midpoint ( $M_{\text{How seriously the goal was taken}} = 4.73$ ;  $t(146) = 5.97$ ,  $p < .01$ ).

Separate t-tests were conducted within each goal condition (see Tables 11 and 12 for results). As expected, under both restriction and indulgence goals, no significant differences were observed for both perceived complementarity and willingness to buy between the two image presentation format conditions. Therefore, the impact of image presentation format on both perceived complementarity and willingness to buy reported in study 4 were no longer significant. These non-significant effects were consistently found in this study for all three different bundles of long-term goal and temptation products (i.e., multigrain tortilla chips + soft drinks, Omega 3 milk + cookies, and organic carrots + vegetable dip).

**Table 11: Means Comparisons Results: Impact of Image Presentation Format under  
a Restriction Goal**

<b>Goal dependent variable</b>	<b>Mean Same image (N= 36)</b>	<b>Mean Separate Images (N=38)</b>	<b>T-values</b>	<b>P-values</b>
<i><u>Restriction goal</u></i>				
<i>Impact of image presentation on perceived complementarity</i>				
Bundle 1 (milk + cookies)	4.35 (1.40)	4.48 (1.21)	.043	.67
Bundle 2 (tortilla chips + soft drinks)	3.37 (1.17)	3.57 (1.32)	.616	.54
Bundle 3 (carrots + vegetable dip)	4.88 (1.38)	4.79 (1.18)	-0.31	.76
<i><u>Restriction goal</u></i>				
<i>Impact of image presentation on WTB</i>				
Bundle 1 (milk + cookies)	3.73 (1.48)	4.01 (1.61)	.769	.45
Bundle 2 (tortilla chips + soft drinks)	3.25 (1.60)	3.10 (1.51)	-.413	.68
Bundle 3 (carrots + vegetable dip)	4.63 (1.57)	4.20 (1.72)	-1.115	.27

**Table 12: Means Comparisons Results: Impact of Image Presentation Format under an Indulgence Goal**

<b>Goal dependent variable</b>	<b>Mean Same image (N= 36)</b>	<b>Mean Separate Images (N=38)</b>	<b>T-values</b>	<b>P-values</b>
<i><u>Indulgence goal</u></i>				
<i>Impact of image presentation on perceived complementarity</i>				
Bundle 1 (milk + cookies)	4.52 (1.55)	4.26 (1.45)	-.757	.45
Bundle 2 (tortilla chips + soft drinks)	3.22 (1.59)	3.47 (1.54)	.114	.91
Bundle 3 (carrots + vegetable dip)	4.78 (1.59)	4.74 (1.42)	-.137	.89
<i><u>Indulgence goal</u></i>				
<i>Impact of image presentation on WTB</i>				
Bundle 1 (milk + cookies)	4.33 (1.80)	4.50 (1.65)	.414	.68
Bundle 2 (tortilla chips + soft drinks)	3.48 (1.63)	3.53 (1.74)	.690	.49
Bundle 3 (carrots + vegetable dip)	4.36 (1.63)	4.13 (1.60)	-.611	.54

In addition to the t-tests, bootstrap analyses with 5000 bootstrap samples have been undertaken. Results with 95% confidence intervals showed that the total indirect effect (i.e., the difference between the total and direct effects) of image presentation format on willingness to buy through product complementarity was non significant for

the three bundles under both restriction and indulgence goal condition (see Table 13), as expected. In sum, both hypotheses H6 and H7 were supported.

**Table 13: Mediation of the Indirect Effect of Image Presentation Format on WTB through Perceived Complementarity**

Simple indirect effect of Perceived Complementarity	Point Estimate	Confidence Intervals (95%)	
		Lower	Upper
<i><u>Under a Restriction goal (N=74)</u></i>			
Bundle 1 (milk + cookies)	0.82	-0.28	0.49
Bundle 2 (tortilla chips + soft drinks)	0.11	-0.25	0.48
Bundle 3 (carrots + vegetable dip)	-0.72	-0.58	0.37
<i><u>Under an Indulgence goal (N=74)</u></i>			
Bundle 1 (milk + cookies)	-0.13	-0.49	0.22
Bundle 2 (tortilla chips + soft drinks)	0.16	-0.29	0.64
Bundle 3 (carrots + vegetable dip)	-0.03	-0.50	0.43

## 7.5 Discussion

As expected, the significant effect of image presentation format on perceived complementarity, and therefore willingness to buy, disappeared when (1) goal conflict was highlighted in a restriction goal context and (2) when goal conflict was reduced in an indulgence goal context. Study 4 demonstrated that presenting bundled products in separate images lowers perceptions of products complementarity and therefore, consumers' willingness to buy the bundle. This result stems from consumers' perception of goal conflict when products are presented separately. The current study provides empirical support for this proposition by showing that varying goals influences the relationship between image presentation format and willingness to buy through perceived complementarity.

## **Chapter 8: General Discussion**

The purpose of this dissertation was to present a comprehensive view of the impact of perceived complementarity between bundled products on bundle evaluation, while highlighting the flexibility of complementarity perception. In particular, studies 1 and 2 aimed at developing appropriate measures for perceived complementarity, distinguishing it empirically from substitutability and independence, and underline its importance as a trigger for bundle value. On the other hand, studies 3, 4, 5, and 6 emphasized the malleable nature of perceived complementarity in a bundling context.

### **8.1 Summary of Findings**

Several interesting findings are reported in the current research. First, in study 1, reliable and valid measurements for each contingency level are developed using a wide array of bundles and discriminant validity between perceived complementarity, substitutability and independence is established. Second, in study 2, nomological validity for the complementarity scale was verified with another sample of consumers while empirically demonstrating a significant link between perceived complementarity and willingness to buy the bundle using a new set of bundles of complementary, substitutable and independent product categories. The latter key finding has been consistently reported throughout this dissertation.

In the second part of this dissertation, the main focus was on understanding whether complementarity is driven exclusively by bundle composition or whether it is



contingent on contextual presentation effects. Study 3 results demonstrate that personal goals play an important role in consumers' perception of complementarity between bundled products. Bundles composed of two products with restriction-related attributes were perceived as more complementary when evaluated by consumers under a restriction goal than by those under an indulgence goal. On the other hand, bundles composed of two products with indulgence-related attributes were perceived as more complementary when evaluated by consumers under an indulgence goal than by those under a restriction goal. Study 4 shows that the way bundled products are presented (i.e., image presentation format) in the offer significantly impacts perceived complementarity, and consequently bundle value. The findings of study 4 suggest that presenting a long-term goal and a temptation product bundled together on the same image leads to higher perceived complementarity and willingness to buy the bundle than presenting them on separate images. Study 5 extends these findings to pricing strategy applied to bundle components. When consumers evaluated a bundle of a long-term goal and a temptation product where both products were presented under the same image, they perceived a price discount applied on the temptation product as more attractive than an identical price discount applied on the long-term goal product. In contrast, when consumers evaluated the exact same bundle presented with separate images, they perceived the mixed-leader price discount applied on the long-term goal product as more attractive than an equivalent price discount applied on the temptation product. Finally, study 6 identified boundary conditions to the mediating role of perceived complementarity. The mediating effect of perceived complementarity between image presentation format and willingness to buy and the direct effect of image presentation format on willingness to buy, identified in

study 4, were no longer significant when goal conflict was either (1) enhanced under restriction goal or (2) reduced under indulgence goal.

## **8.2 Theoretical and Managerial Implications**

This research represents an important step toward the adoption of reliable and valid scales for the measurement of products' complementarity, substitutability, and independence in the consumer behaviour literature. The perceived complementarity scale has been used throughout this work and it has demonstrated its stability and generalizability through a range of samples, bundles, and situations. Study 1 contributes to the literature in a number of ways. First, the author demonstrates the value to marketing researchers of adopting a multi-items view for the measurement of the interrelationships among bundled products through a series of validity tests. It adds to the empirical research on contingency levels by going beyond the single-item measure traditionally used (see Harlam et al. 1995), which suffers important psychometric flaws (see Nunnally and Bernstein 1994). Secondly, different levels of complementarity, substitutability and independence coexist within bundles that consumers categorize as complements, substitutes or independent products. Results related to discriminant validity show that complementarity, substitutability and independence are distinct aspects and cannot be conceptualized or measured as the ends of a continuum such as in the single-item measure for complementarity/independence used by Simonin and Ruth (1995). Finally, these scales contribute to the literature in a number of marketing areas by providing a useful tool to evaluate the complex interrelationship among products in situations such as in bundle development or in brand extensions. The use of the perceived

contingency levels scales developed in this research will allow for avoiding potentially erroneous classification of bundles as complements, substitutes or independent products based on their own judgment solely or using one single item that does not capture the complexity of the phenomenon (e.g., Harlam et al. 1995).

From a managerial standpoint, these scales can orient managers on which products to bundle by providing a usable tool for the assessment of the degree of complementarity, substitutability, and independence of the to-be-bundled products. These scales would help managers in their assessment of the complex interrelationships among their bundled or to-be bundled products, given that depending on their marketing objective (e.g., offering complementary synergetic products, offering variety or favouring new product trial) they may opt for composing bundles of complements, substitutes or independent products.

In study 2, it has been demonstrated that perceived complementarity among bundled products is the key driver for bundle value, across bundle contingency levels. To the author's knowledge, study 2 is the first research to include bundles of substitutable products in its stimuli. Past research (e.g., Estelami 1999; Harlam et al. 1995; Simonin and Ruth 1998) studied bundles of complements and/or of unrelated products (i.e., independent products) solely, often considering them as the two ends of a continuum. The existence of bundles of substitutes in the marketplace (e.g., yogurts of different flavours, perfumes with different scents, shirts of different colors etc.) in response to consumers' variety seeking and in line extension contexts emphasizes both managerial and theoretical relevance of studying bundles of substitutes.

When building bundles, managers should design their offer in a manner that enhances perceived complementarity, irrespective of the dominant contingency level of the bundle they are creating (i.e., whether it would be a bundle of complements, substitutes or independent products). This is an important managerial issue because managers do sometimes opt for composing bundles of substitutable or independent products to fulfill different consumer needs or achieve different marketing objectives. Past research has demonstrated that individuals are variety-seekers in their consumption decisions (McAlister and Pessemier 1982; Ratner and Kahn 2002). Indeed, “consumers often choose considerable amounts of variety when allowed to choose more than one item from a choice set, even when they are given an option of repeating consumption of favored items” (Ratner and Kahn 2002, p. 246). Therefore, bundles of substitutable products can represent a valuable alternative for consumers to fulfill the need for variety. Also, bundling strategy is often used in the marketplace to encourage trial of new products (Harris 1997; Simonin and Ruth 1995). Popular products are then sold together with new products that are not necessarily made to work in combination with them. Bundles of independent products are often composed for this purpose. Whether bundle products belong to complementary, substitutable or independent product categories, it is crucial to design the offer in a manner that enhances perceived complementarity among bundled products.

Studies 3, 4, 5 and 6 provide evidence that perceived attractiveness of a bundle can be positively affected by goals and contextual information, which highlight products complementarity.

Study 3 is in line with the recent shift in consumer behaviour research from a focus on brand and product benefits to an emphasis on consumer goals and contextual factors that impact the types of categorizations retrieved from memory (Loken 2006). It constitutes a starting point for implementing a contextual approach based on categorization flexibility to the study of the interrelationship among products. A goal-based approach to bundle creation and its promotional strategy can allow for targeting consumers concerned with a particular goal (e.g., health conscious) with a specific communication aiming at priming that goal when marketing bundles for these consumers. This would favour a fit between the two bundled products that both help satisfying that goal, therefore enhancing their perceived complementarity and overall bundle value. For instance, when presenting consumers with a bundle, either in a flyer or on point of purchase, retailers can provide information surrounding the bundle offer that would remind consumers about their goal of indulgence or restriction depending on bundle composition.

Study 4 contributes to the bundling literature by demonstrating that contextual information not related to price (i.e., image presentation format) can also influence perceived bundle value. The manner in which bundles are pictorially represented has a direct impact on consumers' perception of complementarity between bundled products, and therefore on willingness to buy the bundle. This is of managerial relevance since bundles are not represented in store flyers in a constant manner: some bundled products are presented separately (often in supermarket flyers for bundles composed by the retailer) and others are presented together in the same image (often in pharmacies and discount stores for gift sets composed by the manufacturer). The results of study 4

suggest that pictorial presentation should not be used randomly or depending on the availability of pictures, for instance. Instead, it can be used strategically to enhance bundle value, through an increased perception of complementarity among bundled products.

To the author's knowledge, study 5 is the first work to examine the effect of price framing on products complementarity in a bundling context. The results suggest that the superiority of a price bundling strategy is contingent upon bundle composition. Through study 5, this research offers a broader view of the bundling phenomenon by integrating both price bundling and product bundling issues. Specifically, this study underlines the importance of potential goal conflict that can arise from the integration of two products in a bundle -which is an issue inherently related to product bundling strategy- on the perceived attractiveness of a price discount under mixed-leader -which is an added value to bundle evaluation intrinsically related to price bundling strategy. It reconciles both literatures in a context where past research on price bundling has traditionally neglected the potential impact of bundle composition on consumers' perceived price discount attractiveness (see Janiszewski and Cunha 2004; Kaicker, Bearden, and Manning 1995; Mazumdar and Jun 1993).

### **8.3 Limitations and Future Research**

Future research should examine the relationship between product contingency levels and consumers' willingness to pay for the bundle. The existence of varying levels of bundle reservation prices that determine products complementarity, substitutability or independence as suggested in a theoretical model by Venkatesh and Kamakura (2003),

irrespective of product categories, has never been empirically investigated. This research would investigate whether Venkatesh and Kamakura's (2003) method of using bundles reservation prices to identify which bundles can be called bundles of complements, substitutes or independents (i.e., when prices are superadditive for complements, subadditive for substitutes, and equal for independents) reflects actual consumer categorization of these products' contingency level. Also, it would determine whether consumers are willing to pay in a superadditive way for products that they perceive as complements, in a subadditive way for products that they perceive as substitutes, and equally to the sum of the individual items reservation prices for products that they perceive as independent. Results of this future research would provide insightful recommendations for managers in terms of pricing practices in a bundling context.

The author provided empirical evidence in studies 3, 4 and 5 that support the influence of contextual factors on perceived complementarity between bundled products and therefore, on bundle value. In these experiments, different variations on two bundles of complements have been used as stimuli (e.g. tortilla chips + soft drinks, milk + cookies). Of particular interest for future research is to extend the investigation of contextual effects in complementarity perception to bundles of substitutes and independent products.

Another avenue for future research relates to the study of the influence of other types of goals, such as situational goals, on perceived complementarity in order to better understand how goals affect categorization in a bundling context. This would be of managerial relevance when designing seasonal bundles as well as bundles targeting

specific events. This future research would expand the results of study 3, which focused on personal goals.

An additional research extension would be to investigate other types of goal conflict than those examined in studies 4 and 5, which main focus is health-related goal conflict. Other product combinations can be integrated in future research to induce other types of goal conflict, such as study versus entertainment (Fishbach and Zhang 2008).

Finally, throughout this dissertation, only bundles composed of two items have been considered. It would be interesting to investigate how contingency level among products may influence bundle value when bundles are composed of three or more products. In such situation, not only bundles of complements, of substitutes, and independent products can be built. Bundles with mixed contingency levels can also be created, such as two shampoos (substitutes) and a conditioner (complementary product). Although perceived complementarity is expected to be critical to bundle value, the manner to enhance it in such bundle composition has yet to be determined.



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**Appendix 1: An Excerpt from Study 3 Questionnaires**



**Tostitos Multigrain chips**  
(\$3.19)



**Diet Pepsi-Cola**  
(\$3.19)

**Total price = \$6.38**

**When you buy a 220 grams bag of Tostitos Multigrain chips  
and a 6-pack of Diet Pepsi-Cola (710 ml each) together as a bundle**

Please answer the following questions about your evaluation of the **above product bundle**.

**Appendix 2A: An Exerpt from Study 4 Questionnaires**

**Experimental Condition: Same Image Presentation Format**



**2L of Lactantia Omega 3 skim milk  
(\$2.79)**

**350 grams of Christie cookies  
(\$2.79)**

**Total price = \$5.58**

**When you buy 2L of Lactantia Omega 3 skim milk *and* 350 grams of Christie Chunks Ahoy! chocolate chips cookies together as a bundle**

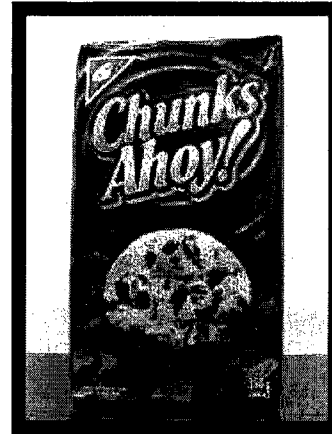
Please answer the following questions about your evaluation of the **above product bundle**.

**Appendix 2B: An Excerpt from Study 4 Questionnaires**

**Experimental Condition: Separate Images Presentation Format**



**2L of Lactantia Omega 3 skim milk  
(\$2.79)**



**350 grams of Christie cookies  
(\$2.79)**

**Total price = \$5.58**

**When you buy 2L of Lactantia Omega 3 skim milk *and* 350 grams of Christie Chunks Ahoy! chocolate chips cookies together as a bundle**

Please answer the following questions about your evaluation of the **above product bundle**.



**Appendix 3A: An Excerpt from Study 5 Questionnaires**

**Experimental Condition: Mixed-Leader on the Goal Product**



**220 grams bag of Tostitos Multigrain  
(Regular Price: \$3.99)**

**6-pack of Coca-Cola  
(Regular Price: \$3.99)**

**Get 40% off the price of  
the Tostitos Multigrain of \$3.99**

**When you buy a 220 grams bag of Tostitos Multigrain chips  
and a 6-pack of Coca-Cola (710 ml each) as a bundle**

Please answer the following questions about your evaluation of the **above product bundle**.

**Appendix 3B: An Excerpt from Study 5 Questionnaires**

**Experimental Condition: Mixed-Leader on the Temptation Product**



**220 grams bag of Tostitos Multigrain  
(Regular Price: \$3.99)**

**6-pack of Coca-Cola  
(Regular Price: \$3.99)**

**Get 40% off the price of  
the Coca-Cola of \$3.99**

**When you buy a 220 grams bag of Tostitos Multigrain chips  
and a 6-pack of Coca-Cola (710 ml each) as a bundle**

Please answer the following questions about your evaluation of the **above product bundle**.