The effects of percentage versus dollar framing in discount promotions: Field applications in retail fast food

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ABSTRACT

The retail sector is a critical component of Australia’s economy. Retailers were negatively impacted by the 2007-2008 global financial crisis, and the key response was to focus on discounting price as a means to maintain sales. However, discount promotions are expensive to implement, and there is often a lack of understanding about the return on investment that is achieved. Retailers need a justification for their investment in this type of marketing activity.

Empirical evidence has indicated the effects of price promotions are short-lived and occur through immediate increases in sales (Gedenk et al. 2006). The effectiveness of price promotions can be improved by optimising the discount rate offered to consumers and by properly presenting the format of the deal (Compeau and Grewal 1998; Krishna et al. 2002). This thesis focuses on the latter, investigating whether the effectiveness of price promotions could be improved by changing the discount format between a percentage-off (e.g., regular $9.95, save 10%) and a dollar-off frame (e.g., regular $9.95, save $1). This phenomenon is known as percentage versus dollar framing (Hardesty and Bearden 2003; DelVecchio, Lakshmanan, and Krishnan 2009).

The literature on percentage versus dollar framing spans three decades. Earlier studies have found only modest impact on consumer behaviour when changing the discount format between percentage-off and equivalent dollar-off formats (e.g., Della Bitta, Monroe, and McGinnis 1981). More recent publications have shown that this type of framing could have more significant effects on buyers’ decision making (e.g., DelVecchio, Krishnan, and Smith 2007; Gendall et al. 2006). However, there has been a lack of evidence on the effects of percentage versus dollar framing in real-world environments as all previous studies have occurred in carefully controlled laboratory settings.
The existing research has not been able to determine the optimal format between percentage-off and dollar-off frames in presenting price discount. The conclusion to date from laboratory-based research is that the percentage versus dollar framing does not have different effects on consumers’ evaluation and purchase of discount brands (Krishna et al. 2002). However, the lack of significant effects of discount framing found in previous studies may be attributed to the variations in research designs, the differences in data collection methods, and the different nature of test products (DelVecchio, Lakshmanan, and Krishnan 2009). The inconsistencies of past research concerning percentage versus dollar framing, in addition to the lack of real-world evidence, have made this phenomenon yet to be fully appreciated by marketing practitioners.

There exists a possibility of finding non-significant effects of discount framing in real-world retail environments. Support for this suggestion is derived from the research of comparative price advertisement. It has been demonstrated that the effects of price presentation tactics, including discount framing, can be rather small when other prominent deal characteristics are taken into account (e.g., Berkowitz and Walton 1980; Dodds, Monroe, and Grewal 1991). For instance, Lichtenstein, Burton, and Karson (1991) showed that changing between equivalent price formats could lead to 4% variance in buyer’s brand evaluations, whereas increasing the discount rate improved brand evaluations by 35%. Accordingly, price presentation tactics such as discount framing have a modest impact in decision making when other prominent deal characteristics such as a discount rate are taken into account.

This thesis proposes to test the effects of percentage versus dollar framing in actual retail settings. Previous studies have demonstrated significant interaction effect between discount framing and discount rate (DelVecchio, Krishnan, and Smith 2007; Hardesty and Bearden 2003). More specifically, as the discount rate increases from small (e.g.,
10% off) to moderate (e.g., 25% off), the effects of percentage versus dollar framing become significant. At a small discount rate (e.g., 10%), buyer responses to a percentage-off discount and a dollar-off discount are expected to be no different. At a moderate discount level (e.g., 25% off) buyers are expected to perceive higher deal value, have higher estimate of internal reference price and purchase more of the discounted product if the discount is presented in percentage-off instead of the equivalent dollar-off format.

To test this proposition, two field experiments were conducted to examine the possible effects the discount rate and discount framing could have on consumer behaviours. The two participating retailers in this research operate in the consumer foodservice sector, offering convenient food and beverages to end consumers. In the two experiments, promotion stimuli were carried by in-store displays, wall menus, and banners. These displays were set up in prominent positions in the stores, so that they were visible to customers who were contemplating purchase decisions. After placing orders, store patrons were approached by the researcher and asked if they would like to complete a survey about the in-store promotion. A survey with customers is the main method of data collection in both experiments. In addition, Experiment II collected store sales data.

Prior to the commencement of the two field studies, a pilot experiment was conducted on a student sample (n = 27). The results indicated that the research scales were reliable and were appropriate to survey actual customers. Subsequently, the two field experiments were conducted between August and September 2012.

Experiment I took place at a franchised coffee shop and involved discounting a premium muffin range. This experiment examined the interaction between the discount rate (moderate 25% discount vs. small 10% discount) and discount frame (percentage-
off vs. dollar-off) in consumer behaviour. The discount rate and discount frame were independent variables. The dependent variables were buyers’ perceptions of deal value, their estimates of internal reference price (IRP), and their reported purchases of the promoted muffins. This created four treatment promotions that offered two small 10% discounts (regular price $4, 40 cents off and regular price $4, 10% off) and two moderate 25% discounts (regular price $4, 25% off and regular price $4, $1 off).

It was hypothesised that the differences in buyer responses to a percentage-off and a dollar-off discount were significantly different at a moderate 25% discount rate, but were not significantly different at a small 10% discount rate. In addition, Experiment I also examined whether buyers evaluated and responded differently to a small and a moderate discount rate. This was to ensure that the true effects of discount framing were properly tested. A survey was the main method of data collection and collected 213 buyer responses.

When the discount rate was small (10% price reduction), Experiment I found no significant effects of discount framing. Presenting the price promotion in the dollar-off frame (regular $4, 40 cents off) did not significantly change buyers’ perceptions of the deal value, their estimates of IRP, nor their reported purchases of the muffins, compared to the percentage-off frame (regular $4, 10% off).

When the discount rate was moderate (25% price reduction), Experiment I did not find significant effects of percentage versus dollar framing. Contrary to expectation, the percentage-off format (regular $4, 25% off) did not generate more favourable perceived value, higher IRP, nor higher reported purchase of the muffins than a dollar-off format (regular $4, $2 off).
Experiment II was conducted at a franchised fast-food restaurant and involved discounting a chicken burrito. This experiment validated the effects of discount framing on buyer responses to a moderate discount rate. Experiment II used the discount frame as the only independent variable. The research design included three experimental conditions; a dollar-off frame (regular price $7.95, $2 off, today $5.95), a percentage-off frame (regular price $7.95, 25% off, today $5.95), and a simple discount frame (regular price $7.95, today $5.95). A control no-discount condition promoted the chicken burrito using only in-store displays.

Experiment II improved on Experiment I in three aspects. First, it compared buyer responses to the two saving-based discount frames with the simple discount frame (simple vs. percentage-off and simple vs. dollar-off). This was to determine whether the general discount framing, other than percentage versus dollar-off, exists outside laboratory environments. Second, Experiment II compared the three discount frames to the control frame (i.e., no discount) to determine the effectiveness of the price promotion in general. Finally, Experiment II used both store sales data and surveys to capture the effects of discount framing. Using store sales data allowed the second experiment to measure accurately the effects of framing on purchase responses. The survey in Experiment II attracted 161 buyer responses.

Experiment II showed that the effects of discount framing were significant in a real-world consumption environment. The actual sales of chicken burritos in the dollar-off discount and the percentage-off discount were significantly higher than sales of the simple discount (regular $7.95, today $5.95). In this case, discount framing effect occurred because consumers responded differently to equivalent formats of the same discounts.
Similar to Experiment I, Experiment II found that buyers exposed to the percentage-off discount (regular $7.95, 25% off, today $5.95) did not have significantly different perceived value, estimates of IRP, and actual purchases of chicken burritos, compared to the dollar-off discount (regular $7.95, $2 off, today $5.95). Sales of chicken burritos were also not significantly different between the two discounts.

Across Experiment I and II, the findings suggest that the effects of percentage versus dollar framing are modest in real-world consumption settings compared with what has been established in laboratory environments (e.g., DelVecchio, Krishnan, and Smith 2007; Gendall et al. 2006; Kim and Kramer 2006). However, this result is consistent with the stream of research on comparative price advertisement, that shows modest effects of price presentation tactics such as discount framing on purchase decisions (e.g., Berkowitz and Walton 1980; Dodds, Monroe, and Grewal 1991; Krishna et al. 2002; Raghubir 2006).

Although the real-world effects of discount framing are modest, their practical implications should not be overlooked. Experiment I showed that changing the discount format from a dollar-off to a percentage-off frame improved the reported sales of muffins by 8%. Experiment II demonstrated that switching the discount format in the same way increased the actual sales of chicken burritos by 3%. The current results are significant because they indicate that up to 8% improvement in short-term sales can be achieved for a discounted product without substantial changes to the underlying discount incentive.

In summary, this thesis found that framing price promotion either as a percentage- or dollar-off format had quite modest effects on buyer behaviour in real-world retail environments. This finding may contradict some of the previous laboratory-based studies that found statistically significant effects of percentage versus dollar framing.
(e.g., DelVecchio, Krishnan, and Smith 2007; Gendall et al. 2006). However, unlike previous studies conducted in contrived settings, the current results were the first to be obtained from retail environments. As a multitude of factors is involved in real-life purchase decisions, detecting the effects of discount framing on consumer behaviour in field experiments is more complicated than doing so in strictly controlled laboratory environments. Furthermore, the finding that small changes to discount format could provide meaningful improvement in sales of discount products is beneficial to marketing practitioners. The implication from this thesis is that an improvement in sales promotion effectiveness can be derived from small but thoughtful changes in the format of promotion materials.
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DECLARATION

To the best of my knowledge and belief, the work presented in this thesis is my own except where specific citations are given to reference the originating authors. In addition, this thesis has not been submitted, either whole or in part, for a degree at any other institutions.

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Cao Thang Pham
TABLE OF CONTENTS

Abstract ...................................................................................................................... iii
Acknowledgement ...................................................................................................... x
Declaration ................................................................................................................. xi

Chapter One Introduction ......................................................................................... 1
Improving the Effectiveness of Sales Promotions .................................................... 2
Discount Framing ..................................................................................................... 2

Chapter Two Literature Review ............................................................................... 7
Sales Promotions ...................................................................................................... 8
Effects of Retailer Promotions ................................................................................. 9
Discount Framing .................................................................................................. 11
Discount Framing Effects ....................................................................................... 13
Current Evidence of Discount Framing Effects on Purchase Behaviour ............... 22
Discount Framing Effects in Real-World Environments ........................................ 26
Discount Frame and Discount Rate Interrelationship ............................................. 30
Summary ................................................................................................................. 35

Chapter Three Hypotheses Development .............................................................. 37
Effects of Discount Rate on Buyer Behaviour ....................................................... 38
Effects of Perceived Value on Purchase Behaviour ............................................... 39
Effects of Internal Reference Price on Purchase Behaviour ................................ 39
Interaction between Discount Rate and Discount Frame ....................................... 41
Summary ................................................................................................................. 46

Chapter Four Pilot Experiment .............................................................................. 49
Ethical Consideration .............................................................................................. 49
Survey Preparation .................................................................................................. 50
Pilot Experiment Design ......................................................................................... 58
Preliminary Data Analysis ...................................................................................... 63
Scale Validation ...................................................................................................... 64
Manipulation Check ............................................................................................... 66
Conclusion .............................................................................................................. 70
LIST OF FIGURES

Figure 1: Example of choice scenario in Gendall et al. (2006) .................................................. 24
Figure 2: The Café Layout ........................................................................................................... 71
Figure 3: Example of a Display in Experiment I ........................................................................ 75
Figure 4: Examples of Sign in Experiment I .............................................................................. 76
Figure 5: Wall Menu at the Café ............................................................................................... 77
Figure 6: Example of Display and Signs in Experiment I ("$1 off" condition) ......................... 83
Figure 7: The Layout of the Restaurant .................................................................................... 115
Figure 8: Wall Menu at the Restaurant ..................................................................................... 120
Figure 9: Example of Display in Experiment II ....................................................................... 121
Figure 10: Experimental Stimuli in Experiment II .................................................................. 128
Figure 11: Effects of Discount Frame in Perceived Value of the Chicken Burrito ............... 137
Figure 12: Effects of Discount Frame in Internal Reference Price of the Chicken Burrito...... 138
Figure 13: Sales of Chicken Burrito across Conditions in Experiment II ............................... 140
LIST OF TABLES

Table 1: Summary of Research Hypotheses ................................................................................ 47
Table 2: Perceived Value, Internal Reference Price and Reported Purchase Measures .......... 57
Table 3: Reliability of Perceived Value and Internal Reference Price Measures in Pilot Experiment ................................................................................................................... 64
Table 4: Descriptive Statistics of Pilot Experiment ................................................................ 67
Table 5: Experimental Conditions in Experiment I ................................................................. 73
Table 6: Participant information in Experiment I ................................................................. 85
Table 7: Proportions of survey buyers purchases promoted muffins in Experiment I ........ 86
Table 8: Reliability of Perceived Value and Internal Reference Price in Experiment I ........ 87
Table 9: Descriptive Statistics of Dependent Measures in Experiment I ................................. 88
Table 10: Mean Age across Conditions in Experiment I ............................................................. 89
Table 11: Gender across Conditions in Experiment I ................................................................. 89
Table 12: Store Visit Frequency across Conditions in Experiment I ........................................... 90
Table 13: The Effects of Age, Gender, and Discount Rate on Perceived Value, and Internal Reference Price of the Muffin ...................................................................................... 91
Table 14: Statistical Techniques for Hypotheses Testing in Experiment I ................................. 94
Table 15: Effects of Discount Rate and Discount Frame on Perceived Value and Internal Reference Price of the Muffin ...................................................................................... 97
Table 16: Effects of Discount Frame on Perceived Value and Internal Reference Price of the Muffin at Small Discount Rate ...................................................................................... 99
Table 17: Effects of Discount Frame on Perceived Value and Internal Reference Price of the Muffin at Moderate Discount Rate ................................................................. 100
Table 18: Effects of Discount Frame, Discount Rate, Perceived Value and Internal Reference Price on Reported Sales of the Muffins .............................................................................. 101
Table 19: Effects of Discount Frame, Discount Rate, and Perceived Value on Reported Sales of the Muffins ............................................................................................................ 103
Table 20: Effect of Discount Frame and Perceived Value on Reported Sales of the Muffin at a Small Discount Rate ................................................................. 105

Table 21: Effect of Discount Frame and Perceived Value on Reported Sales of the Muffin at a Moderate Discount Rate ............................................................ 106

Table 22: Effect of Discount Frame and Discount Rate on Perceived Value and Internal Reference Price with Store Visit Frequency and Age as covariates ................. 108

Table 23: Effect of Discount Frame, Discount Rate, Perceived Value, Internal Reference Price and Store Visit Frequency on Reported Sales of the Muffin ...................... 108

Table 24: Summary of Hypotheses Testing Results in Experiment I ........................................ 110

Table 25: Experimental Conditions in Experiment II ............................................................ 119

Table 26: Actual Sales Volumes at the Restaurant in Experiment II ...................................... 129

Table 27: Participant Information in Experiment II .............................................................. 130

Table 28: Reliability of Perceived value and Internal Reference Price in Experiment II ............. 131

Table 29: Descriptive Statistics for Dependent Measures in Experiment II ........................... 132

Table 30: Statistic Tests in Experiment II .............................................................................. 134

Table 31: Effects of Discount Frame on Sales of the Chicken Burrito – A Percentage-off Discount as Baseline ................................................................. 141

Table 32: Effects of Discount Frame on Sales of the Chicken Burrito – A Simple Discount as Baseline ...................................................................................... 141

Table 33: Effects of Discount Frame on Sales of the Chicken Burrito – A No-Discount Promotion as Baseline ................................................................. 142

Table 34: Effects of Discount Frame on Perceived Value and Internal Reference Price of the Chicken Burrito with Store Visit Frequency as covariate ................................. 143

Table 35: Effects of Discount Frame, Perceived Value, Internal Reference Price and Store Visit Frequency on reported sales of the Chicken Burritos ................................ 144

Table 36: Summary of Hypotheses Testing Results in Experiment II ...................................... 146
CHAPTER ONE

INTRODUCTION

The retail sector is a critical component of the Australian economy. There are currently 140,000 retail businesses in Australia, accounting for 4.1% of Australia’s Gross Domestic Product and 10.7% of employment (Economic structure and performance of Australian retail industry 2011). This includes 13,595 food and beverage outlets (Euromonitor 2013).

Many retailers have been hard-hit by the global financial crisis. The iconic David Jones department store chain in Australia has not recovered to its pre-GFC revenues and profitability achieved in 2008 (David Jones annual report 2012). Other major firms, such as Angus and Robertson and Colorado, have gone out of business altogether.

In this environment, retailers must maximise the return on investment of their expenditure. Marketing is one area where retailers have been cutting budgets in recent years (Edgecliffe-Johnson 2012). Improving the efficiency of money spent on marketing is one lever retailers can use to respond to the challenging environment and seek competitive advantage over peers. For marketing practitioners, it is critical to demonstrate the ongoing importance and value that these activities can bring to their firms.

Price discounting has been an essential response of many retailers to this challenging environment. Discounting has been a strategy to maintain sales levels, but has meant many retailers have achieved lower margins that impact their profitability. This thesis will investigate an important element of discount promotion called the discount frame, with practical implications for optimising future promotions.
IMPROVING THE EFFECTIVENESS OF SALES PROMOTIONS

Sales promotions typically account for a significant share of marketing budgets, surpassing advertising expenses. During the 1997-2004 period sales promotions accounted for roughly 75% of the marketing budget for US packaged goods manufacturers (van Heerde and Neslin 2008). Elsewhere, American retailers are reported to spend a third to half of their marketing budget on promotions (Nusair et al. 2010). Empirical evidence has indicated that the effectiveness of price promotions can be improved by optimising the discount rate to increase the buyer responses whilst maintaining healthy margins for retailers (Ailawadi et al. 2006).

In addition to using the discount rate, the short-term effects of price promotions can be improved by proper framing of the format of the deal (Compeau and Grewal 1998; Krishna et al. 2002). Keeping the discount rate constant, altering the semantic description, visual effects, and physical aspects of the price promotion, can change buyers’ evaluation and purchase behaviours (Ragubir 2006). This thesis elaborates on the effects of one of the most popular price presentation tactics, discount framing.

DISCOUNT FRAMING

Framing is the act of describing the same issue in alternative ways (Frisch 1993). Stating that a glass is “half full” or “half empty” is a classic example of framing. Framing effects occur when people respond differently to alternative descriptions of the same object. Framing phenomenon has been researched across a wide range of behavioural domains including medical decisions (e.g., O’Connor, Pennie and Dales 1996), monetary decisions (e.g., Fagley and Miller 1997) and public relations (e.g., Druckman 2001).
In marketing research, framing effects have been demonstrated across a variety of consumption situations. Framing effects occur when varying the descriptions of the object changes the way consumers respond. For example, a call for charity donation yielded more compliance when the amount of contribution was quoted in a dollar-a-day format (e.g., $1 per day) rather than in a lump sum contribution (e.g., $365/year) (Gourville 1998).

Another example of discount framing comes from the study of Ganzach and Karsahi (1995). When existing non-users of credit cards were approached by the firm’s telemarketers, their subsequent behaviours were influenced by the initial message that was used to convince them. Card owners were twice as likely to resume using their credit cards and also spent twice as much on their cards when the initial message highlighted the losses they could suffer for not using their cards, compared to when the message emphasised the gains in using their cards (Ganzach and Karsahi 1995).

As a specific framing phenomenon, discount framing refers to changes in the discount format without altering the absolute savings. In particular, research has demonstrated that by switching the presentation of the discount between percentage-off (e.g., regular $9.95, save 10%) and a dollar-off format (e.g., regular $9.95, save $1), retailers could improve buyers’ evaluations of the current offer and facilitate stronger intention to buy the discount brand (Chen, Monroe, and Lou 1998; Hardesty and Bearden 2003). Recently, it has been shown that changing between percentage and dollar frames may have an effect on buyers’ brand choices (Gendall et al. 2006). These findings suggest that proper alternating of the discount format between dollar-off and percentage-off discount formats could influence consumer behaviour.
What appears to be a gap in percentage versus dollar framing research is that the existing research has been conducted mostly in laboratory environments. In a typical laboratory-based study, student subjects were exposed to promotion stimuli that carried discount frames and were asked to evaluate the promotions (e.g., Chen, Monroe, and Lou 1998). Recent research has validated the effects of percentage versus dollar framing in less contrived research environment, using simulated shopping laboratory (Hardesty and Bearden 2003), and collecting data from actual shoppers through mall intercepts (Gendall et al. 2006). Nevertheless, participants in these studies were aware of the simulated nature of the purchase tasks they were asked to engage in. As a result, they might not behave the same way in these simulated tasks as they would in similar real-life purchase scenarios.

To the best of the author’s knowledge, the current thesis is the first to examine the effects of percentage versus dollar framing in actual retail contexts. The key contribution of this thesis is a methodological one. Participants in this research were actual shoppers recruited whilst undertaking their shopping activities. Research stimuli were actual promotions that buyers could redeem. Buyers’ responses to these promotions were recorded using survey and store sales data.

The current research investigates the interrelationship between discount framing and discount rate and their effects on buyer behaviour in actual retail environments. Previous research has demonstrated that consumers tend to evaluate products differently at different discount rates (Kalwani and Yim 1992). In particularly, they appear to conduct no or low information search when the brand is advertised at a small discount rate, but become more engaged in evaluating the purchase as the discount rate grows larger (Grewal, Marmorstein, and Sharma 1996). The current thesis examines the effects of percentage versus dollar framing effects at a small 10% and a moderate 25% discount rate.
Findings from this thesis provide significant implications for retailers because dollar-off and percentage-off discount frames are two of the most commonly used tactics to present discount promotions (Chandrashekaran 2004; Della Bitta, Monroe, and McGinnis 1981; Yin and Dubinsky 2004). Due to the lack of empirical evidence in this research stream, we are left to wonder what happens when consumers are exposed to percentage-off versus equivalent dollar-off discounts in actual shopping environments. By conducting field experiments to assess the impact of this type of discount rating, this thesis provides significant insights that are useful for both retailers and marketing researchers alike.

The original contribution of this thesis lies in its methodology. To the researcher’s best knowledge, this study is the first to examine the effects of framing discounts in percentage-off and dollar-off formats in real-life purchase situations. Whilst there is a decent volume of research examining this issue in research laboratories, there is still a gap in our knowledge as to whether the discount framing effect would exist in retail environment. Conducting field experiments that examine the real-life impact of percentage-off versus dollar-off discounts would allow closing the loop in our knowledge on if and how this type of semantic framing could affect customer behaviours.

Furthermore, given the phenomenon of discount framing does not occur in research laboratories, empirical evidence produced by the current thesis provides a crucial verification for this stream of research. This is in line with recent call for academic researchers to focus more on empirical generalisation of established knowledge in conjunction with conceptual exploration (Easley, Madden and Dunn 2000; Hubbard and Lindsay 2002; Tadajewski 2011). By testing the impact of presenting a discount in alternative formats could have on actual consumers, the current research provides business practitioners with insights into the effectiveness of discount framing.
CHAPTER TWO

LITERATURE REVIEW

Sales promotion is an important part of marketing activities and increasingly so in recent decades (Gedenk et al. 2006). In some cases, sales promotion has been reported to account for three-quarters of the firm’s marketing budget (van Heerde and Neslin 2008). When implemented properly, sales promotions would benefit firms through an immediate surge in the sales of the promoted brands (Blattberg, Briesch, and Fox 1995). The magnitude of these short-term sales increases depends largely on the discount rate or the size of saving (Ailawadi et al. 2006). As the discount rate increases, the sales of the promoted brand tend to increase. Furthermore, when the discount rate increases, consumers’ perceived value of the deal increases whilst their intention to search for a lower price elsewhere decreases (Compeau and Grewal 1998; Della Bitta, Monroe, and McGinnis 1981).

In addition to using the discount rate, increasing short-term sales of discount brands may also be improved through the presentation of the sales promotions (Grewal and Compeau 1992). Consumers are subjective in their evaluation of the saving value offered by the deal and have been known to assess identical pricing information differently depending on the deal’s presentation (Raghubir 2006). Improving price presentation could lead to more favourable perceived value of the deal and potentially induce more sales. Unlike changes in discount rates that require financial outlay, refining the price presentation could improve the short-term effect of sales promotions whilst not impacting retailers’ margins.
SALES PROMOTION

Definition

Sales promotion is, “an action-focused marketing event whose purpose is to have a direct impact on the behaviour of the firm’s customers” (Blattberg and Neslin 1990, p.3). According to this definition, a sales promotion is not a single tactic, but instead a collaboration of various promotional activities, price and non-price that aims to induce immediate purchases. For instance, a coupon promotion is a marketing campaign whose main purpose is to offer potential customers monetary discounts to increase sales of a chosen product (Blattberg and Neslin 1990). This price tactic is often accompanied by supportive non-price activities such as in-store displays and advertising that help create awareness for the coupon promotion. Accordingly, a sales promotion campaign is not about a single tactic but refers to the collaboration of several promotional efforts that collectively aim to induce purchases from target consumers.

Retailer Promotions

There are three types of sales promotions; consumer promotions, trade promotions and retailer promotions. While consumer promotions and trade promotions are manufacturers’ initiatives targeting end consumers and trade intermediaries respectively, retailer promotions are retailers’ initiatives targeting end consumers (Blattberg and Neslin 1990). The current thesis investigates retailer promotions.

Furthering the knowledge of retailer promotions is important for two key reasons. First, the manufacturer and retailer often have different objectives toward promoting a brand. Unlike manufacturers who are more concerned about the presence and revenue of their brands in retail stores, retailers are more concerned about the overall profitability of the category as a whole (Gedenk et al. 2006). Hence, the knowledge of implementing manufacturer promotions may not be relevant for retailers.
Second, it has been well-known that consumers make most of their purchase decisions in-store, especially for low-cost items (Inman, Winer, and Ferraro 2009). For instance, it was found that 55% of German grocery shoppers made their purchases in-store, as opposed to before their shopping trips (Gedenk et al. 2006). This finding implies that retailers are in a better position than manufacturers to address consumer needs. By studying retailer promotions, this thesis contributes to the sales promotion literature by furthering the knowledge on the effects of retailer promotions on the behaviour of end consumers.

EFFECTS OF RETAILER PROMOTIONS

Short-term Effects of Retailer Sales Promotions

The literature has shown that the long-term effects of sales promotions are quite weak (Ehrenberg, Hammond, and Goodhardt 1994; Mela, Gupta, and Lehmann 1997). Using panel data of 25 grocery products collected from four developed nations, Ehrenberg, Hammond, and Goodhardt (1994) examined purchase rates before, during and after sales promotions. It was found that only 1% of post-promotion sales of the brands could be attributed to price promotions. Sales of the promoted brands typically reverted back to the pre-promotion levels when price promotions ceased.

In addition, frequent sales promotions could have negative impacts on sales of that particular brand in the longer term. Using store-level data over 124 weeks, Kopalle, Mela and Marsch (1999) discovered long-term “triple jeopardy” effects for sales of liquid dishwashing detergent brands. First, the sales of detergent brands were found to decrease as their promotions became regular. Second, these short-term price discounts were also found to result in higher price sensitivity among buyers, which in turn made it harder for the retailers to achieve a greater margin over time. Finally, as discount
promotions become more frequent, it also becomes more difficult for the retailers to use promotions as a tool to steal sales from its competitors.

In contrast to the weak and potentially negative long-term impact, the short-term effects of sales promotions have been established to be quite strong and consistent (Blattberg, Briesch, and Fox 1995; Gedenk et al. 2006). Sales increases are caused mostly by customers who switch brands to take advantage of the deals. In some cases, the brand-switching effect could account for as much as 84% of the increase in short-term sales (Gupta 1988). Short-term sales spikes could also come from customers who shorten their purchase intervals or increase their purchase quantity. In both cases, sales increases are attributed to higher consumption rates (Ailawadi and Neslin 1998; van Heerde, Leeflang, and Wittink 2004).

**Improving Short-term Effects of Retailer’ Price Promotions**

Empirical evidence has indicated that a price promotion can be improved by optimising the discount rate offered to consumers (Ailawadi et al. 2006). As the discount rate increases, sales of the discount brands also grow. The profitability of a sales promotion can be optimised by varying the discount rate to draw in more customers whilst maintaining an attractive margin for retailers.

In addition to the discount rate, existing research has demonstrated that the short-term effect of price promotion can be improved by appropriately changing the format of the deal (Krishna et al. 2002). Keeping the discount rate constant, altering the price presentation using tactics such as differentiating semantic description and visual effects of the discount promotion can change buyers’ evaluation and purchase behaviours (Kim and Kachersky 2006; Ragubir 2006). This thesis concentrates on one of these presentation tactics, discount framing.
DISCOUNT FRAMING

Framing

Framing is the act of describing the same issue in alternative ways (Frisch 1993). “To frame is to select some aspects of perceived reality and make them more salient in the communication text” (Etman 1993, p.52). A framing effect occurs when “two logically equivalent statements of a problem lead decision makers to choose different options” (Rabin 1998, p.36).

For example, participants in the Levin and Gaeth study (1988) sampled identical minced beef that had been described to them earlier as “75% lean” or as “25% fat”. Subjects who sampled the “75% lean” beef judged it as tastier, leaner, and less greasy than those who tried the “25% fat” beef. Accordingly, by alternating the semantic description of the same product from positive to negative, marketer could influence customer evaluation of the same product.

Discount Framing

As a special case of framing, discount framing involves presenting a discount in alternative semantic formats without changing its underlying economic benefits. For instance, a 33% discount on a $3.95 muffin can be presented in a percentage-off frame (“save 33%”), a dollar-off frame (“save $1.30”), or a simple discount frame (“now $2.65”). These monetary discount frames have been commonly used by retailers (Yin and Dubinsky 2004) and have been the subjects of recent research in discount framing (e.g., DelVecchio, Lakshmanan, and Krishnan 2009).

Apart from monetary discount frames, a price promotion can also be framed in purchase volume. The muffin deal above can also be framed as “buy two get the third one free”. Because this volume-base promotion requires consumers to pay for two muffins before realising the discount benefit, it may deter some customers from buying
due to constraints in budget or storage capacity (Sinha and Smith 2000). Investigating the differences between monetary and volume-based discounts is beyond the scope of this thesis and has been completed elsewhere (Gendall et al. 2006; Sinha and Smith 2000).

The following review will show that the current literature has not offered consistent findings on the effects of percentage versus dollar framing (Krishna et al. 2002). It is unclear whether a percentage-off or a dollar-off frame produces more favourable responses from buyers. This thesis focuses on these two frames of price promotions. From here onward, the term “discount framing” refers to the percentage versus dollar framing and not general framing unless noted otherwise.
DISCOUNT FRAMING EFFECTS

A discount framing effect occurs when consumers respond differently to alternative presentation of the same price promotion. In an experiment conducted by Hardesty and Bearden (2003), the participants (n = 96) who were staff at a university browsed within a simulated shopping environment. They were asked to choose one brand from each of the four grocery categories. Some of the brands in each category were discounted at 50%. After making their decisions, participants were asked to estimate the value of their chosen items. Participants who had been exposed to the percentage-off discounts suggested the discount brands offering greater savings than those who had been exposed to the equivalent dollar-off discounts (Hardesty and Bearden 2003).

Past research has also demonstrated the effects of discount framing on other cognitive evaluations including estimates of internal reference price (Chandrashekaran and Grewal 2006; DelVecchio, Krishnan, and Smith 2007) and purchase willingness (Chen, Monroe, and Lou 1998; Kim and Kramer 2006). In general, a discount framing effect occurs when switching between a percentage-off to an equivalent dollar-off frame lead to changes in consumers’ perceived value, their estimates of internal reference price, or their willingness to purchase the promoted brand.
Discount Framing Effect on Buyer’s Perceived Value

Relative thinking in information processing

Research on the dominance of percentage over absolute numerical format dates back to the early 19th century. Weber-Fechner’s law of psychophysics (i.e., Weber’s law) proposes that human’s ability to distinguish two stimuli depends on the relative difference between the stimuli rather than their absolute difference (Blattberg and Neslin 1990).

The essence of relative thinking in Weber’s law has been refined in recent economic decision theories such as the Transaction Utility Theory (Thaler 1985). This theory postulates that the psychological utility that consumers derive from a fixed amount of money is inversely related to the price of the item. For example, subjects were willing to exert more effort to save $5 on a $25 radio than on a $500 television (Thaler 1980). Given both purchases offered identical savings in absolute value ($5), subjects would have used similar efforts to obtain both products had they used absolute differences to guide their decisions.

Thaler’s (1980) initial evidence on the preference for relative thinking has been subsequently supported by a number of studies (Heath, Chatterjee, and France 1995; Thaler 1985; Tversky and Kahneman 1981). In a more recent study, when subjects were given prices and price changes in absolute values, they were likely to convert these absolute amounts back to relative values (Chatterjee et al. 2000). This finding implies that buyers would exert less mental effort to evaluate the deal if its saving value is presented in a percentage-off, as opposed to a dollar-off format. Allowing more intuitive processing of price information is important when there is little incentive for making thorough purchase decisions, as is the case with low-cost items. For the current thesis, the findings of Transaction Utility Theory mean that consumers may exhibit more
favourable responses to a percentage-off discount than to an equivalent dollar-off discount because the former makes deciding on the purchase easier.

Beyond laboratory evidence, Pratt, Wise, and Zeckhauser (1979) discovered that the variance of sales price for a particular product was proportional to the mean price of the same product across different retailers. In this instance, it appears that marketing practitioners were applying the essence of relative thinking by reducing the price of their products in proportional terms to those of other retailers. Using this pricing tactic would make it easier for consumers to compare price across stores, which in turn allows retailers to emphasise the saving value offered at their stores.

The key implication from these studies is that consumers are predisposed to evaluate savings in relative terms rather than in absolute terms (Chatterjee et al. 2000; Kahneman and Tversky 1981; Thaler 1980, 1985). As a result, a percentage-off discount that presents the savings in a relative value should appeal to consumers who prefer to simplify their decision-making process whilst obtaining appropriate decision outcomes (Beach and Mitchell 1978; Darke, Freedman, and Chaiken 1995). On the other hand, a dollar-off discount format that presents savings in absolute value would require buyers to convert it back to percentage saving information. Therefore, a percentage-off discount, rather than a dollar-off discount, would appeal more to consumers in purchase evaluation.

*Discount framing effect on buyers’ perceived value*

Several studies in the current literature have demonstrated consistent evidence to support the preference for percentage-off discounts over dollar-off discounts in presenting price promotions (e.g., Chen, Monroe, and Lou 1998; Gendall et al. 2006; Hardesty and Bearden 2003). Participants tend to develop more favourable perception
of value for the discounted item when it is presented to them in a percentage-off format than in a dollar-off format.

For instance, Chen, Monroe, and Lou (1998) showed participants different advertisements for the same price promotion for a box of floppy disks (regular price $9.95). Participants who were exposed to a percentage-off discount (save 10%) suggested that the promotion provided larger saving value than those who were exposed to an equivalent dollar-off discount (save $1). In this example, although the two deals offered the same value, the percentage-off frame was thought to provide greater saving than the dollar-off frame.

The tendency for people to prefer a percentage-off format over an equivalent dollar-off format does not always hold because some boundary conditions exist. Chen, Monroe, and Lou (1998) discovered in the same study that the effect of percentage versus dollar framing was reversed when the promoted item became more expensive. Participants considered a dollar-off discount (save $195) to deliver greater savings than a percentage-off discount (save 10%) when the promoted item was an expensive computer (regular price of $1950).

In other circumstances, relative thinking tends to decline when the saving is very small (e.g., 1% price reduction) (Darke and Freedman 1993), or when it is difficult to process the deal value relative to the product’s base price (Nunes and Park 2003). When one of these conditions occurred, respondents in these studies were found to rely on both absolute saving value and relative saving value to evaluate the discounted item (Darke and Freedman 1993).

In summary, when participants in previous experiments were asked to indicate their perceived value of a discounted item, they were more likely to consider a percentage-off discount to offer greater saving value than an equivalent dollar-off discount. This
judgement occurs due to people’s tendency to use relative thinking in purchase evaluation. Some boundary conditions do exist where a dollar-off format may be preferred over a percentage-off format (e.g., Chen, Monroe, and Lou 1998). However, among low-cost and frequently purchased products, presenting a discount promotion to buyers in a percentage-off frame is likely to have more favourable perceived value than doing so in an equivalent dollar-off frame.

**Discount Framing Effect on Buyer’s Estimates of Internal Reference Price**

*Underestimation tendency in processing percentage information*

Participants in previous studies were typically exposed to either a dollar-off format (e.g., regular price $3.95, save $1.30) or a percentage-off format (e.g., regular $3.95, save 33%). Typically, the price advertisements in these studies typically contained only a regular price ($3.95) and a saving frame (33% or $1.30) but not a discount price. Between the two discount formats, estimating the discount price tend to be biased when the promotion was presented in a percentage-off frame (e.g., regular $3.95, save 33%) than a dollar-off frame (e.g., regular price $3.95, save $1.30).

This effect occurs because people usually underestimate the saving value from a percentage-off discount (Morwitz, Greenleaf, and Johnson 1998; Gupta and Cooper 1992; Obermiller and Spangenber 1998). For instance, a “33% off” discount on a $3.95 product is often estimated to provide less than $1.30 (= $3.95×33%) saving. The tendency to undervalue, in turn, inflates the estimate of the discount price. In this example, the discount price associated with the percentage-off format would be perceived to be greater than $2.65 (= $3.95 - $1.30).

On the other hand, computing the discount price is easier when the price promotion is presented in a dollar-off format (e.g., regular $3.95, save $1.30) (Estelami 2003). This is because the computation process only involves subtracting the saving value from the
regular price ($3.95- $1.30). Unlike estimating discount price from a percentage-off format that requires two computation steps, the discount price computed from a dollar-off should be more accurate because only one simple subtraction is required. Therefore, estimating the discount price based on a dollar-off format should result in relatively quick and more accurate outcome (around $2.65).

In general, a percentage-off discount tends to result in a higher estimate of discount price than an equivalent dollar-off discount. This indicates that a percentage-off discount may not be as effective as an equivalent dollar-off discount. Nevertheless, a review of other relevant studies suggests another possibility.

**Discount framing effect on buyers’ estimates of internal reference price**

A number of studies have measured the effects of percentage versus dollar framing using several forms of price-related estimates. Most notable is the estimate of internal reference price (Chandrashekar and Grewal 2006; DelVecchio, Krishnan, and Smith 2007; Kim and Kramer 2006). Internal reference price (IRP) is an internal standard which a buyer uses to compare against the advertised price to assess the value of the offer (Kalyanaram and Winer 1995; Monroe 2003).

Different consumers might hold different IRPs for the same brand. Individuals’ IRP depends on their prior purchase experience, in-store purchase context, and their personal characteristics such as price sensitivity and brand loyalty (Mazumdar, Raj, and Sinha 2005; Moon, Russell, and Duvvuri 2006; Urbany, Bearden, and Weilbaker 1988). Generally, consumers who have frequent encounters to sales promotions or have strong knowledge of the brand were found to have lower IRP than those who do not (Kalwani and Yim 1992; Urbany et al. 1997).

Furthermore, prior purchase experience could influence the way consumers use IRP in their decision making. In particular, those who have frequently been exposed to a
brand’s promotional activities tend to rely on IRP to evaluate their purchases. On the other hand, consumers who have less experience with a brand’s promotional activities are prone to use retailer’s advertised price to evaluate the product value (Mazumdar and Papatla 2000).

Purchase context such as store environment and store type can also influence consumers’ IRP. Berkowitz and Walton (1980) found their research subjects considered a product to be worth more if it was sold at a department store rather than a discount store. The different store settings frame the subjects’ perception of the product quality, which led to different price expectations for the same product.

Finally, consumers’ IRP could be the product of pricing information presented to them at the point of purchase. In Lynch and Ariely’s (2000) study, participants appeared to be more price-sensitive when buying wine from an online store that made price comparisons to other stores, as opposed to an online store that did not publish that information. By making price comparisons available, retailers could lower consumer price expectation for the current purchase. This conclusion has been echoed by other research, which showed consumers revise their existing IRP in the presence of external reference prices available to them at point of purchase (Chandrashekaran and Grewal 2006; Compeau and Grewal 1998).

Anchor/Adjustment Theory suggests that buyers devise their IRP using both the regular price and the discount price (Tversky and Kahneman 1974). This theory suggests that buyers would initially anchor their estimates of IRP on the regular price. They then adjust the initial estimates toward the lower discount price to form their IRP (DelVecchio, Krishnan, and Smith 2007).

Assuming discount price is not given and the only available information to consumers is the regular price and the saving value. The previous discussion has led to
the conclusion that an estimate of the discount price that saving value is presented in a percentage-off format would be higher than an equivalent dollar-off format. Keeping the regular price constant, estimating IRP depends on the discount price. As a result, an estimate of IRP for a percentage-off discount would be adjusted to a smaller degree than that of a dollar-off discount. Consequently, this leads to a higher estimated IRP for a percentage-off discount than a dollar-off discount.

**Discount Framing Effect on Buyers’ Purchase Behaviour**

The previous discussion has demonstrated that the percentage versus dollar framing could have effects on either buyer’s perceived value of the discounted product or their estimates of IRP associated with that item. Depending on the type of framing effect that is measured, previous studies have demonstrated very different and somewhat contradictory predictions about the effects of discount framing on consumer behaviours.

*The effect of perceived value on purchase behaviour*

Empirical studies have shown that participants’ perceived value of the deal directly determine their willingness to purchase that item (Dodds, Monroe, and Grewal 1991; Grewal, Monroe, and Krishnan 1998; Grewal et al. 1998; Zeithaml 1988). Similarly, these studies have also established a positive relationship between perceived value and purchase intention. As the perceived value of the promoted item becomes more favourable, the participants are more likely to purchase the product.

Among low-cost frequently-purchased items, research participants tend to perceive percentage-off discounts to offer greater savings than equivalent dollar-off discounts (e.g., Chen, Monroe, and Lou 1998; Hardesty and Bearden 2003). Therefore, it is expected that percentage-off discounts would also lead to stronger likelihood of buying the promoted items than the equivalent dollar-off discounts.
Effect of internal reference price on purchase behaviour

It has been found that frequent exposures to discount promotions over time can influence the internal reference price (IRP) that consumers use to evaluate a brand (e.g., Alba et al. 1999; Kalwani and Yim 1992). Participants’ estimates of a brand’s IRP are expected to change after exposure to a discount price. The adjusted IRP would have a significant effect on the evaluation of the discounted item, and whether or not participants would prefer to buy that item (Chandrashekaran and Grewal 2006).

When using IRP to evaluate a discount brand, participants tend to compare their IRP against the regular price, rather than against the discount price. This is because participants often view a regular price as a real price, whereas they typically consider a discount price as an unusual price (Compeau and Grewal 1998). The lower participants’ IRPs are to the regular price, the more favourable their evaluation of the discounted item.

In addition, the previous discussion has shown that participants exposed to a dollar-off discount estimated a lower IRP, compared to those exposed to a percentage-off discount (DelVecchio, Lakshmanan, and Krishnan 2009; Kim and Kramer 2006). A lower estimated IRP relative to the regular price means that customers exposed to a dollar-off discount would have more favourable evaluation of the discounted item than those exposed to an equivalent percentage-off discount. Accordingly, a dollar-off discount is expected to attract more sales for the same brand than an equivalent percentage-off discount.

In summary, a dollar-off discount would be rated more favourably than a percentage-off discount when consumers are encouraged to evaluate the discount using their IRP (DelVecchio, Krishnan, and Smith 2007; Kim and Kramer 2006). On the other hand, a percentage-off discount would receive more favourable ratings than a dollar-off discount.
discount when buyers are not required to engage in arithmetic computation in purchase evaluation (Chen, Monroe, and Lou 1998; Hardesty and Bearden 2003). Accordingly, buyers’ purchase behaviour would differ depending on the type of evaluation they use.

CURRENT EVIDENCE OF DISCOUNT FRAMING EFFECTS ON PURCHASE BEHAVIOUR

Existing Evidence

The effects of the percentage versus dollar framing on respondent behaviour have been shown across different stages of the decision-making process including price estimation and perceived value (e.g., Chen, Monroe, and Lou 1998; Kim and Kramer 2006). However, these measures of the discount framing effects are perceptual and intentional in nature. The current literature has yet to show the behavioural effects of discount framing, meaning demonstrating the discount framing effects on purchase behaviour (except for Gendall et al. 2006).

For example, participants in Chen, Monroe, and Lou’s (1998) study were more likely to report higher perceived value when a premium computer (regular price $1950) was presented as “$195 off” rather than “10% off”. However, neither the percentage-off nor the dollar-off format had any effect on participants’ intention to purchase the computer. This means that a significant effect of discount framing on perceived value is not sufficient to induce participants’ willingness to purchase (Della Bitta, Monroe, and McGinnis 1981).

Similarly, Chandrashekaran and Grewal (2006) found significant framing effects in the adjustments of IRP. When viewing a promotion for a pack of AA batteries, a sample of students adjusted their IRP further from the regular price in response to a dollar-off discount, as opposed to a percentage-off discount. Nevertheless, presenting the promotion in either format did not change their perceived value of the offer. The authors
reasoned that the framing effects occurred early in the decision-making process when the students were adjusting their IRP, but then became obsolete when more considerations were taken into account in forming their perceptions of the offer.

The two examples above have inferred that the effects of discount framing can be inconsistent between different stages of the decision-making process (Chandrashekaran and Grewal 2006; Chen, Monroe and Lou 1998). Discount framing effects tend to appear in the earlier stages of the decision-making process when participants evaluate the promotions based on the information provided. These effects are less likely to occur later in the decision-making process when participants make use of other sources of information in making their purchase decision (DelVecchio, Krishnan, and Smith 2007; Chandrashekaran 2004; Della Bitta, Monroe, and McGinnis 1981).

Although switching from a percentage-off to a dollar-off format could have an impact in evaluation of the discount, this tactic is less likely to influence the decision to whether or not buyers purchase the discount item. Only one study has been able to demonstrate the discount framing effect on purchase behaviour (Gendall et al. 2006).

**Significant Findings may be Biased**

To the best of the author’s knowledge, only one study has so far found a significant effect of the discount framing in purchase behaviour (Gendall et al. 2006). In this experiment, New Zealand shoppers (n =322) were recruited through mall intercepts and were asked to respond to a series of choice scenarios (Figure 1). The treatment of product (computer vs. stereo) was between-subject. Subjects in individual conditions completed six choice scenarios related to each product. In each scenario, both percentage-off discount and dollar-off discount were presented. Therefore, this experiment treated the discount frame (percentage-off vs. dollar-off) as a within-subject factor.
The results showed that the product branding played a significant role in determining buyers’ choice of brands. However, the discount format played an even bigger role in consumers’ brand choice. Across both categories, the dollar-off discounts generated significantly higher brand preferences than the equivalent percentage-off discounts.

FIGURE 1
Example of choice scenario in Gendall et al. (2006)

![Example of choice scenario](image)

Some criticisms of this experiment’s design should be raised. First, unlike the other studies in discount framing, Gendall et al. (2006) treated the discount frame (percentage-off vs. dollar-off) as a within-subject factor. In this experiment, buyers were repeatedly exposed to six similar choice scenarios that involved the same product and contained both percentage-off and dollar-off discounts. This could sensitise buyers to the dependency between these choice scenarios. This sensitisation effect could lead buyers to form hypotheses about the experiment and respond accordingly (Greenwald 1976; Keren 1993). Buyers may have begun to understand the nature of the experiment, and deliberately chosen the simple (dollar-off) format versus the complicated (percentage-off) format to save cognitive resources in making repetitive choices. Thus,
consistent preference for dollar-off discounts to percentage-off discounts found in this experiment may be attributed to the biases induced by the repeated within-subject treatment of discount framing.

Second, the purchase scenarios used in this experiment do not reflect realistic consumption situations. Buyers of an expensive product, such as a computer, would be unlikely to make a spontaneous purchase decision based on very limited product information. Due to the high costs and risks associated with buying expensive electrical equipment, potential buyers of computers are expected to conduct more thorough evaluation prior to their purchases. Therefore, their decisions are more likely to be influenced by more substantial aspects such as machine configuration and brand name, rather than subtle price presentations such as discount framing. The lack of validity in the choice scenarios may limit the ability of future research to replicate Gendall et al.’s (2006) results in other research contexts.

In general, the available evidence in the literature of discount framing has not been able to conclude whether switching between a percentage-off and a dollar-off format would have a significant effect on purchase behaviour in actual consumption settings. The current thesis aims to close the gap in providing evidence on the behavioural effects of the percentage versus dollar framing.
DISCOUNT EFFECTS ON BUYER BEHAVIOUR IN REAL-WORLD RETAIL ENVIRONMENTS

Research Gap

The lack of validity in Gendall et al.’s (2006) experiment is also pertinent to most studies in the current literature on discount framing. This is because most of the existing studies on the effects of discount framing have been conducted within laboratories following similar protocols.

In these experiments, university student participants typically viewed promotion stimuli before indicating their opinions on the experimental promotions. Participants were often well aware of the fictional nature of their experimental tasks. The demands occurring in laboratory-based experiments do not guarantee that participants would evaluate promotional stimuli the same way they would in real-life consumption situations (Robson 2002; Rosenthal and Rosnow 1991; Rosnow and Rosenthal 2008). It is currently unknown whether the laboratory-based findings on the effects of percentage versus dollar framing would be replicated in the marketplace.

Recent studies have shown some improvements research methodology into the effects of discount framing. Newer research has been conducted in a simulated shopping lab (Hardesty and Bearden 2003) and with actual shoppers through mall intercepts (Gendall et al. 2006). However, participants in these studies were still aware that they were participating in a research study. Therefore, they may not respond as they would in normal shopping environments. Until there is evidence on the effects of this type of price presentation in a non-contrived environment, the findings from the literature on percentage versus dollar framing cannot be fully supported.
This thesis aims to commence closing this gap by extending the current literature of discount framing to real-world consumption settings. The literature on percentage versus dollar framing so far has not demonstrated the effects of this phenomenon in a retail environment. Studies that fill this methodological gap would help extend the validity of discount framing, and provide crucial evidence on their effects in actual purchase behaviour. To the best of the author’s knowledge, this thesis is the first to investigate the effects of percentage versus dollar framing in actual retail contexts.

It should be acknowledged that the majority of the studies reviewed so far have focused on fast-moving consumer-good retail settings. One might suggest that this environment is not the same as a fast-food retail setting which is the focus of the current thesis. Due to the popularity of discounts in consumer-good retail environment, the current academic literature of discount framing has been dominated with studies conducted in this type of setting. As a result, it has been quite common for previous research that investigated discount framing effects in other related contexts such as durable products (e.g., Berkowitz and Walton 1980; Sheng and Pan 2009) to use this literature as a guide for their investigations.

Similarly, there are many studies of the framing effects in fast-food environments that are built upon the consumer-good literature (e.g., Sharpe and Staelin 2010; Taylor 2001; Teng 2009). These studies are not reviewed in this chapter because they investigate other forms of discount framing such as product bundling (Sharpe and Staelin 2010; Taylor 2001) and discounting with a minimum purchase requirement (Teng 2009). Keeping this in mind, the current thesis will later discuss its findings and implications in relation to fast-food retailing whilst also relate to previous research findings in consumer-good retail environments.
Presence of Other Considerations in Purchase Evaluations

Percentage versus dollar framing is one of the many tactics used to present price promotions. Beyond price presentation, research on the comparative price advertisements has established that deal characteristics and situational factors can also influence purchase decisions (Compeau and Grewal 1998; Raghubir 2006). Examples of the deal characteristics are the frequency of the offer and the depth of the offer (i.e., high vs. low discount rate). Examples of the situational factors include brand type (national vs. home brands), store type (everyday-low-price vs. department stores), and product type (durable vs. non-durable goods).

Several empirical studies have demonstrated that the effects of price presentation tactics are quite small relative to the effects of other deal characteristics on purchase evaluation (e.g., Berkowitz and Walton 1980; Della Bitta, Monroe, and McGinnis 1981; Dodds, Monroe, and Grewal 1991; Lichtenstein, Burton, and Karson 1991). For instance, participants in the Lichtenstein, Burton, and Karson study (1991) saw a price advertisement for an electronic calculator that differed in the semantic presentation and the levels of the discount rate (e.g., “seen elsewhere for $, our price $” and “was $, now $”). The results indicated that the effects of semantic cues were quite small, explaining only 4% of the variance on buyers’ perceived value. On the other hand, the discount rate explained around 35% of the variance on the same dependent variable. Hence, the discount rate, rather than the semantic descriptions of the discount, had a critical effect on consumer’ perceptions of the deal value.

In a meta-review that surveyed 20 research articles published between 1980 and 1996, Krishna et al. (2002) investigated the effects of product and deal factors in shaping respondents’ perceptions of savings. Among the three groups of variables, deal characteristics were found to have the most significant influence on the respondents’
perceived value of the discount items. This was followed by price presentation tactics, and lastly by situational factors.

Time pressure is one of the contextual features that have been shown to influence the way buyers evaluate the product (Inman, Peters, and Raghubir 1997). When less time is available for making purchase decisions, consumers tend to use simplified decision making or engage in no purchase evaluation. On the other hand, when more time available, consumers can elaborate more on their purchase decision and engage in more systematic evaluation of price information (Park, Iyer, and Smith 1989).

In general, the literature on comparative price advertisements has shown that the effects of price presentation tactics are modest relative to that of the discount rate, but are more important than situational factors such as time pressure in influencing buyers’ evaluations of the discount brands (Compeau and Grewal 1998; Krishna et al. 2002). This has an important implication for the study of discount framing in real-world retail settings. Previous laboratory-based experiments have been able to detect significant effects of the discount framing when controlling for other considerations in purchase tasks. Nevertheless, as there is a multitude of decision criteria involved in decision-making that could not be accounted for in real-world retail environments, the effects of discount framing may be modest compared to what has been found in previous laboratory-based settings.
DISCOUNT FRAME AND DISCOUNT RATE INTERRELATIONSHIP

Discount Rate

The discount rate is the amount of monetary benefit or the size of saving that a discount promotion offers to buyers. The discount rate appears to be the most crucial determinant of sales of discount products (Berkowitz and Walton 1980; Della Bitta, Monroe, and McGinnis 1981). In a meta-analysis that surveyed more than four decades of publications (1961-2004) using manufacturer, store, and consumer panel data, Bijmolt, van Heerde, and Pieters (2005) found the average price elasticity to be -2.62. This means that decreasing a brand price by 10% leads to an increase in purchase demand of 26.2%.

In addition, an increase in the discount rate (or decrease in price) can also improve consumers’ perceived value of the promoted brand (Compeau and Grewal 1998; Della Bitta, Monroe, and McGinnis 1981; Krishna et al. 2002). The greater the discount rate, the more favourable buyers’ perception of the offer value.

The discount rate has also been found to have a negative relationship with buyers’ estimates of their internal reference price (IRP) (Mazumdar, Raj, and Sinha 2005). Understanding the effects of discount framing on buyers’ IRP is important because previous research has assumed that buyers would use the current IRP to evaluate their future purchases (Briesch et al. 1997; Mayhew and Winer 1992).

A greater discount rate has been suggested to lead to a lower estimate of IRP for the discount brand (Chandrashekaran and Grewal 2006; Lichtenstein and Bearden 1989; Lichtenstein, Burton, and Karson 1991). When the discount rate increases, buyers’ perceived value and their purchases of the discount brand increase, while their estimates of IRP decrease.
Discount Rate and Processing of Price Information

If one assumes that information processing consumes cognitive resources, buyers are expected to prefer obtaining an adequate evaluation of a discount brand while minimising their cognitive effort in doing so (Beach and Mitchell 1978). As the discount rate increases, the absolute saving derived from purchasing the discount brand becomes greater. This provides greater incentive for buyers to engage in a more thorough evaluation of the deal.

The discount rate has been shown to influence buyers’ willingness to process product information and to search for better prices (Compeau and Grewal 1998; Darke, Freedman, and Chaiken 1995; DelVecchio, Krishnan, and Smith 2007). For instance, Darke, Freedman, and Chaiken (1995) showed that participants (n =180) were more likely to search for better prices in other stores when they had been exposed to a 10% discount, compared to a 30% discount of a stereo speaker. 63% of the participants who were offered a 30% discount chose to end their price search and were willing to consider purchasing the featured stereo at the current store. Only 30% of the participants stopped their price search when they were offered a 10% discount.

In this example, participants who were shown a small discount believed that greater value could be obtained by searching elsewhere for better prices, while those who were shown a larger discount were less inclined to seek further quotes. Indeed, findings from a meta-analysis confirmed that the greater the discount rate, the lower buyers’ perceived benefits of engaging in additional search for a better price (Compeau and Grewal 1998).

In addition, the discount rate has been shown to have effect on the extent of information processing. Among low-cost products, DelVecchio, Krishnan, and Smith (2007) predicted that a larger discount rate would increase participants’ motivation to process information on a range of shampoo brands. In this experiment, the test shampoo
brand was presented either in a dollar-off or a percentage-off format, together with other shampoo brands. When the discount rate was small (save 13%, regular $3.39), the difference between the regular price and the discount price ($3.39 vs. $2.95) represented trivial savings (44 cents = $3.39 - $2.95). Hence, the integration of the discount rate into regular price may not be worth the cognitive effort participants needed to expend in calculating the new price. When the discount rate was high (save 43%, regular $3.39), the difference between the discount price and the regular price ($3.39 vs. $1.94) represented greater savings ($1.45). In this case, the benefit of accurately estimating the discount price may justify expending the cognitive effort in completing this calculation.

A common theme has emerged from reviewing these past studies. When the discount rate is low, evaluation of price information is less likely to occur because the benefits of doing so are small. A lack of information processing does not allow buyers to recognise subtle discount framing information. When a discount rate increases, buyers are more likely to engage in purchase evaluation. In this case, buyers are more likely to become susceptible to discount framing effects.

**Discount Framing Effects at a Small Discount Rate**

When the discount rate is small (e.g., 10% off the regular price), the current thesis proposes that responses to the percentage-off format will be no different than those to the equivalent dollar-off format. When participants in previous studies viewed small discounts for low-cost items, they often overlooked the pricing information and relied on more prominent cues, such as brand names, to guide purchase decisions (DelVecchio, Krishnan, and Smith 2007; Gendall et al 2006). As a result, the effects of percentage versus dollar framing could be insignificant when buyer respond to small discounts in real-life environments when various other considerations could be more prominent than discount framing information.
Discount Framing Effects at a Moderate Discount Rate

When the discount rate is moderate (e.g., 25% off the regular price), the benefits associated with analysing product information increase. Buyers have more incentives to evaluate the purchase value accurately. However, unless they are motivated and able to process product information thoroughly, the cost/benefit approach in decision making (e.g., Beach and Mitchell 1978) suggests that most buyers would attempt to conduct purchase evaluation whilst minimising their effort in doing so.

To simplify purchase evaluation, buyers tend to use decision heuristics, or rules-of-thumb (Darke, Freedman, and Chaiken 1995). Because decision heuristics only provide approximate estimates of purchase values, compared to a thorough evaluation, biases are likely to occur, which could impact purchase choice.

When evaluating a price promotion, buyers tend to perceive a percentage-off format to provide more value than an equivalent dollar-off format (Chen, Monroe, and Lou 1998; Hardesty and Bearden 2003). This is because a percentage-off format is congruent with their tendency to evaluate prices, and price changes, in relative values (Chatterjee et al. 2000; Kahneman and Tversky 1981; Thaler 1980, 1985). Presenting a discount in the percentage-off format would simplify purchase evaluation. Therefore, the cost/benefit approach suggests that a percentage-off discount would appeal more to buyers than an equivalent dollar-off discount.

However, when participants in previous research were encouraged to estimate the monetary savings using arithmetic computation, different effects of discount framing occurred. They were more likely to underestimate the saving value derived from a percentage-off discount (e.g., regular $3.95, save 33%), compared to a dollar-off discount (e.g., regular $3.95, save $1.30) (Morwitz, Greenleaf, and Johnson 1998; Gupta and Cooper 1992; Obermiller and Spangenber 1998). Keeping the regular price
constant, undervalued saving inflates the discount price for a percentage-off discount (i.e., higher than $2.65) but not for a dollar-off discount (i.e., approximately $2.65).

The Anchor/Adjustment Theory suggests that both the regular price and the discount price help anchor buyers’ estimate of IRP (Tversky and Kahneman 1974). Because an estimate of the discount price is higher for a percentage-off format than an equivalent dollar-off format, participants would adjust their IRP to a lesser degree when facing the former than the latter. This means a higher estimated IRP for a percentage-off discount than a dollar-off discount.

Finally, buyers’ perception of deal value, rather than their IRP, has been shown to have more direct effects on their purchase decision (Grewal, Monroe, and Krishnan 1998; Grewal et al. 1998). This is especially true in situations involving low-cost and frequently purchased items. In these circumstances, participants are less likely to engage carefully in arithmetic computation to evaluate their value (Dickson and Sawyer 1990). Consequently, purchases decisions would be expected to be guided by buyers’ perceived value of the discounted items, rather than their estimate of IRP. For low-cost frequently purchased items, buyers exposed to a percentage-off discount are expected to report more purchases than buyers exposed to a dollar-off discount.

In general, it is expected that buyers in actual retail environments respond differently to a percentage-off format and a dollar-off format for moderate price promotions. Buyers exposed to a percentage-off discount would have more favourable perceived value of the discount brand, higher estimates of IRP, and more purchases of the brand, compared to those exposed to an equivalent dollar-off discount.
SUMMARY OF THE CURRENT LITERATURE ON DISCOUNT FRAMING

This literature review has discussed the research on the percentage versus dollar framing and its effects on buyer responses to discount brands. In general, discount framing is the act of describing the same deal in alternative formats without changing the underlying economic incentives. Discount framing effects occur when consumers respond differently to a percentage-off discount (e.g., regular $3.95, save 33%) than to an equivalent dollar-off discount (e.g., regular $3.95, save $1.30).

The current literature on percentage versus dollar framing lacks evidence of this phenomenon in real-world consumption settings. This is an important issue given how often retailers make use of both percentage-off and dollar-off formats in presenting their price promotions (Chandrashekaran 2004; Della Bitta, Monroe, and McGinnis 1981; Yin and Dubinsky 2004). Therefore, examining the effects of percentage versus dollar framing in actual retail environments would not only fulfil a methodological gap in the current research of discount framing, but also produce findings that may have significant implications for marketing practitioners.

Therefore, this thesis aims to investigate whether percentage versus dollar framing could have significant effects on buyer responses to price promotion in actual retail environments. Unlike previous studies of discount framing that were conducted within laboratory environments, there are several factors that cannot be controlled in field experiments. Some of these factors may be more important than price framing including the discount rate (e.g., Berkowitz and Walton 1980; Della Bitta, Monroe, and McGinnis 1981; Dodds, Monroe, and Grewal 1991; Lichtenstein, Burton, and Karson 1991). As a result, the effects of percentage versus dollar framing found in real-life retail environment may be modest relative to what has been found in laboratory-based experiments.
As an important purchase consideration, discount rates have been shown to influence the extent of product evaluation (Compeau and Grewal 1998; Darke, Freedman, and Chaiken 1995). As a discount rate increases, the incentives associated with proper evaluation of the purchase also increase. In fact, participants in previous experiments were more thorough in evaluating their purchases when the discount rates became larger (Darke, Freedman and Chaiken 1995; DelVecchio, Krishnan, and Smith 2007).

In general, this thesis proposes that there are significant interaction effects between the discount rate and discount framing in buyer responses to price promotion in real retail environments. As the discount rate increases, the effects of percentage versus dollar framing on consumer behaviour become significant (DelVecchio, Krishnan, and Smith 2007; Hardesty and Bearden 2003). In other words, the effects of discount framing on buyer responses to a promoted brand are not significant at a small discount rate but are expected to be significant at a moderate discount rate.
CHAPTER THREE
HYPOTHESES DEVELOPMENT

The discount rate has been shown to be the most important determinant in the decision to purchase a discount brand (Krishna et al. 2002; Lichtenstein, Burton, and Karson 1991). It is proposed here that when the discount rate increases from small to moderate, buyers would respond more favourably to the discount brand.

The current literature has established that buyers are more rigorous in their purchase evaluation at a moderate discount rate than at a small discount rate (Darke, Freedman, and Chaiken 1995; Kalwani and Yim 1992). They typically show a lack of interest in evaluating purchase information when a small discount is provided on a low-cost frequently purchased product (Gendall et al. 2006). However, when the discount increases to a moderate size, buyers exert more effort to evaluate purchase information (DelVecchio, Krishnan, and Smith 2007).

Given that discount framing effects can only occur when buyers attempt to evaluate purchase value, this thesis proposes that the discount rate may interact with the percentage versus dollar framing. At a small discount rate, the differences in buyer responses to a percentage-off and an equivalent dollar-off discount are expected to be not significant, due to the lack of buyers’ information processing. At a moderate discount rate, the frame-based differences in buyer responses to discount promotions would be significant. The following discussion will elaborate on the rationale behind the hypotheses pursued in this research.
EFFECTS OF DISCOUNT RATE ON BUYER BEHAVIOUR

The discount rate is the amount of monetary incentive a price promotion offers. An increase in the discount rate can improve consumers’ perceived value of the promoted brand (Compeau and Grewal 1998; Krishna et al. 2002). The greater the discount rate, the more favourable buyers’ perceived value of the discount brand becomes (Berkowitz and Walton 1980; Della Bitta, Monroe, and McGinnis 1981). In addition, an increase in the discount rate could have an adverse effect on buyers’ estimates of internal reference price (IRP) for the discount brand (Chandrashekaran and Grewal 2006; Lichtenstein and Bearden 1989; Lichtenstein, Burton, and Karson 1991). A larger discount rate often results in lower estimates of IRP. More importantly, an increase in the discount rate has been found to lead to an increase in sales of the discount brand (Bijmolt, van Heerde, and Pieters 2005). The greater saving the discount offers, the higher the sales.

\( H_1: \) There are expected to be significant differences in consumer responses to a promoted brand when a discount rate is small and when it is moderate. More specifically,

\( H_{1a}: \) Buyers exposed to a moderate discount rate will report significantly higher perceived values of the promoted brand than buyers exposed to a small discount rate

\( H_{1b}: \) Buyers exposed to a moderate discount rate will report significantly lower estimates of internal reference price associated with the promoted brand than buyers exposed to a small discount rate

\( H_{1c}: \) Buyers exposed to a moderate discount rate will report significantly more purchases of the promoted brand than buyers exposed to a small discount rate
EFFECT OF PERCEIVED VALUE ON PURCHASE BEHAVIOUR

A perception of deal value is an evaluation that takes into account what one gives and what one gets from purchasing a discounted item (Lichtenstein, Burton, and Karson 1991; Thaler 1985; Zeithaml 1988). Empirical evidence has shown that buyers’ perception of the offer’s value has a positive relationship to their purchase behaviour (Dodds, Monroe, and Grewal 1991; Grewal, Monroe, and Krishnan 1998; Grewal et al. 1998; Zeithaml 1988). As buyers’ perceived value of the promoted product become more favourable, they are more likely to purchase the product.

H₂: There is a positive relationship between buyers’ perceived value and whether they purchase the promoted brand

EFFECT OF INTERNAL REFERENCE PRICE ON PURCHASE BEHAVIOUR

Internal reference price (IRP) is an internal standard which buyers use to compare against the prices they observe in the marketplace (Kalyanaram and Winer 1995; Monroe 2003). It has been shown that frequent exposures to discount promotions could affect the reference price consumers use to evaluate a product (e.g., Alba et al. 1999; Kalwani and Yim 1992). Buyers’ estimates of IRP are expected to change after exposures to discount prices.

When evaluating the discount item using IRP, buyers are more likely to be influenced by the regular price information than the discount price information. This is because a regular price is typically viewed as a real price, whereas a discount price is often considered as an unusual price (Chandrashekaran and Grewal 2006; Compeau and Grewal 1998). Therefore, buyers are expected to place more weight in an advertised regular price than in a discount price, when judging the purchase value.
The Anchor/Adjustment Theory is often used to explain how buyers adjust their IRP in the presence of a price promotion (Tversky and Kahneman 1974). It posits that buyers tend to anchor their estimates of IRP on the regular retail price. They then adjust the initial anchor toward the (lower) discount price to form their estimates of IRP (Tversky and Kahneman 1974; Chandrashekaran and Grewal 2006). The lower the discount price is relative to the regular price, the lower the estimated IRP.

The estimated IRP is then compared directly to the regular price to determine the value of the discounted item. The lower the estimated IRP (and hence the lower discount price relative to the regular price) the greater the value that buyers would perceive. This influences the decision as to whether one would purchase the discounted item.

**H3:** The lower buyers’ estimates of internal reference price are relative to the regular price, the more likely they are to purchase a promoted brand.

This thesis posits that buyers tend to see the advertised regular price as the real price that they would pay for the same brand once the promotion ceases. Therefore, the lower their estimates of IRP relative to the regular price should represent greater perceived saving from the purchase. Because buyers are assumed to adjust their IRP using the regular price and the discount price as anchors, their IRP estimates should lie between these two extremes. Hence, the higher the IRP estimate is relative to the discount price the higher the likelihood of purchasing the discount brand. This is another way to state H3.

There is an alternative proposition for the relationship between IRP and regular price and the likelihood of customers making a purchase of the discount brand. If buyers consider the current discount price as the normal price in disguise, their likelihood of purchasing the discount brand will be opposite to the current H3. Particularly, the higher the estimate of IRP relative to the discount price, the higher purchase likelihood of the promoted brand.
This alternative proposition is driven by the assumption that buyers are frequently exposed to promotions and have seen discount prices for the same brand on a regular basis (Kalwani et al. 1990; Mayhew and Winder 1992). These buyers tend to perceive the current discount price as the real price for the brand. On the other hand, the current thesis assumes that most buyers see the current discount price as a one-off opportunity and not the normal price they would pay for the same brand on a regular basis (Chandrashekaran and Grewal 2006).

These two underlying assumptions have dominated IRP research among low-cost products (Mazumdar, Raj, and Sinha 2005). By testing $H_3$, the current thesis can provide more empirical evidence on how buyers evaluate discount prices versus regular prices in fast-food retailing context.

**INTERACTION BETWEEN DISCOUNT RATE AND DISCOUNT FRAME IN REAL-WORLD ENVIRONMENTS**

**Discount Framing**

Discount framing involves presenting the saving information of a discount promotion in alternative formats, without changing its underlying economic benefits. In this thesis, the focus is on the percentage versus dollar framing of discount promotions. For instance, a $1.30 discount on a $3.95 product can be presented as a “33% saving” or as “$1.30 off the retail price.”

Changing the discount format from a percentage-off frame to a dollar-off frame could lead to changes in (1) buyers’ perceived value of the promoted brand, (2) their estimates of internal reference price of the brand, and (3) sales of the promoted brand (e.g., Chandrashekaran and Grewal 2006; Chen, Monroe, and Lou 1998; Gendall et al. 2006; Hardesty and Bearden 2003).
Effects of Discount Rate on Information Processing

If one assumes that processing information consumes cognitive resources, buyers will prefer to obtain an appropriate evaluation of a discount brand whilst minimising their cognitive effort in doing so (Beach and Mitchell 1978). With higher discount rate, buyers would have greater monetary incentive to expend more cognitive effort in processing product information properly or face higher risks if they do not evaluate their purchases thoroughly. Indeed, increasing the discount rate has been shown to increase buyers’ willingness to process product information (DelVecchio, Krishnan, and Smith 2007) and decrease their intention to search for better prices elsewhere (Compeau and Grewal 1998; Darke, Freedman, and Chaiken 1995). Given that changing the discount frame from percentage-off to dollar-off could vary the degree that buyers process product information, the discount rate may also interact with discount framing to influence consumer behaviour.

Effects of Discount Framing at a Small Discount Rate

When a discount rate is small, determining the purchase value accurately is less likely to occur because consumers often overlook the discount information in making decisions to purchase low-cost items. Therefore, this lack of interest in processing product information means that the discount framing effects are less likely to occur at a small discount rate (Chen, Monroe, and Lou 1998; Gendall et al. 2006).
H4: When the discount rate is small, buyer responses to a percentage-off discount are expected to be not significantly different from their responses to an equivalent dollar-off discount. More specifically,

H4a: Buyers exposed to a percentage-off discount will report no significant differences in their perceived value of the promoted brand compared to buyers exposed to an equivalent dollar-off discount

H4b: Buyers exposed to a percentage-off discount will report no significant differences in their estimates of internal reference price of the promoted brand compared to buyers exposed to an equivalent dollar-off discount

H4c: Buyers exposed to a percentage-off discount will report no significant differences in their purchases of the promoted brand compared to buyers exposed to an equivalent dollar-off discount

Effects of Discount Framing at a Moderate Discount Rate

At a moderate discount rate, the benefits associated with analysing product information increases. Buyers have more incentives to evaluate the purchase value accurately. However, unless they are motivated and able to process product information thoroughly, the cost/benefit approach (e.g., Beach and Mitchell 1978) suggests that most buyers would attempt to conduct purchase evaluation whilst minimising their effort in doing so.

To simplify purchase evaluation, buyers tend to use decision heuristics, or decision rules-of-thumb (Darke, Freedman, and Chaiken 1995). Because decision heuristics only provide approximate estimates of purchase values compared to a thorough evaluation, biases emerge in the decision outcomes.
When evaluating a discount brand, buyers often perceive a percentage-off format to offer better value than an equivalent dollar-off format (Chen, Monroe, and Lou 1998; Hardesty and Bearden 2003). This is because a percentage-off format is congruent with people’s tendency to evaluate prices, and price changes, in relative terms (Chatterjee et al. 2000; Kahneman and Tversky 1981; Thaler 1980, 1985). Therefore, presenting a discount in the format that is congruent with how people process price information is expected to be more conducive to decision making. It follows that between the two formats, a percentage-off discount rather than a dollar-off discount will appeal to buyers who want to simplify their decision-making.

When consumers are encouraged to estimate their monetary saving using some form of arithmetic computation, different effects of discount framing would occur. This is because the saving derived from a percentage-off discount is often undervalued, compared to a dollar-off discount (Morwitz, Greenleaf, and Johnson 1998; Gupta and Cooper 1992; Obermiller and Spangenber 1998). Keeping the regular price constant, the undervaluing tendency could cause buyers to arrive at a higher estimated sales price for a percentage-off than a dollar-off discount. Because buyers often use the current sales price to adjust their internal reference price (e.g., Briesch et al. 1997; Mazumdar et al. 2005; Mayhew and Winer 1992), a percentage-off discount would lead to higher estimates of internal reference price than an equivalent dollar-off discount.

Finally, percentage versus dollar framing is expected to have effects in the actual purchase of the discount brand. Between the two variables, the perception of offer value has been shown to have more direct effect on buyers’ purchase decision than buyers’ adjusted internal reference price (Grewal, Monroe, and Krishnan 1998; Grewal et al. 1998). As a result, it is predicted that the effects of discount framing on buyers’ purchase responses is congruent with that of their perceived value of the promoted brand. It is proposed that:
**H5:** When the discount rate is moderate, buyer responses to a percentage-off discount are expected to be significantly different from their responses to an equivalent dollar-off discount. More specifically,

**H5a:** Buyers exposed to a percentage-off discount will report significantly more favourable perceived value of the promoted brand than buyers exposed to an equivalent dollar-off discount

**H5b:** Buyers exposed to a percentage-off discount will report significantly higher estimates of internal reference price of the promoted brand than buyers exposed to an equivalent dollar-off discount

**H5c:** Buyers exposed to a percentage-off discount will report significantly higher proportion of purchases of the promoted brand than buyers exposed to an equivalent dollar-off discount

**Effects of Discount Framing in Real-World Environments**

It has been shown that discount framing effects are more likely to occur in the early stage of the decision process, when buyers rely on available pricing information to evaluate the purchase value. These effects subsequently become obsolete when buyers seek and utilise additional information in forming their purchase decisions (Della Bitta, Monroe, and McGinnis 1981; Chandrashekaran 2004). As a result, it is possible that the percentage versus dollar framing may not have significant effects on sales of discount brands in actual retail environments.

Furthermore, the effects of price presentation tactics on buyer behaviour have been shown to be quite modest. The stream of research on comparative price advertisement has demonstrated that changing price presentation tactics for the same discount only delivers a modest impact in consumer responses (e.g., Berkowitz and Walton 1980; Dodds, Monroe, and Grewal 1991). This stream of research has demonstrated that there
are more important considerations other than the presentation format of the deal that could influence purchase decisions. Moreover, evidence from laboratory research has shown that there are more powerful ways of framing a discount rather than presenting it as percentage-off or dollar-off format (Krishna et al. 2002).

In general, all of these findings give reasons to suspect that the effects of percentage-off versus dollar-off may be difficult to detect when testing in real-world consumption environments. This might have a direct consequence to H₅, which examines the differential effects that framing discount as percentage-off versus dollar-off could have on buyer behaviour. In the lights of this possible scenario, H₅ may need to be revised depending on the findings from the first field experiment.

SUMMARY

This chapter has developed a series of testable research hypotheses to investigate the interaction effect between discount framing and discount rate in actual retail environments. It is expected that there are no significant differences in buyer responses to a percentage-off discount and an equivalent dollar-off discount when the discount rate is small (H₄). However, when the discount rate is moderate, frame-based differences are expected to be significant (H₅). Furthermore, the discount rate is suggested to have positive effects on buyers’ perceived value, their estimates of internal reference price, and their purchase of the discount brands (H₁). Similarly, perceived value (H₂) and internal reference price (H₃) are proposed to have significant relationships to purchase of the discount brand. Table 1 summarises all the hypotheses.
TABLE 1

Summary of Research Hypotheses

EFFECTS OF DISCOUNT RATE

H1a  Buyers exposed to a moderate discount rate will report significantly higher perceived values of the promoted brand than buyers exposed to a small discount rate

H1b  Buyers exposed to a moderate discount rate will report significantly lower estimates of internal reference price associated with the promoted brand than buyers exposed to a small discount rate

H1c  Buyers exposed to a moderate discount rate will report significantly more purchases of the promoted brand than buyers exposed to a small discount rate

EFFECT OF PERCEIVED VALUE

H2  There is a positive relationship between buyers’ perceived value and whether they purchase the promoted brand

EFFECT OF INTERNAL REFERENCE PRICE

H3  The lower buyers’ estimates of internal reference price are relative to the regular price, the more likely they are to purchase a promoted brand.

INTERACTION BETWEEN DISCOUNT FRAME AND DISCOUNT RATE

H4a  When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their perceived value of the promoted brand compared to buyers exposed to an equivalent dollar-off discount

H4b  When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their estimates of internal reference price of the promoted brand compared to buyers exposed to an equivalent dollar-off discount

H4c  When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their purchases of the promoted brand compared to buyers exposed to an equivalent dollar-off discount

H5a  When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly more favourable perceived value of the promoted brand than buyers exposed to an equivalent dollar-off discount

H5b  When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly higher estimates of internal reference price of the promoted brand than buyers exposed to an equivalent dollar-off discount

H5c  When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly higher proportion of purchases of the promoted brand than buyers exposed to an equivalent dollar-off discount
CHAPTER FOUR
PILOT EXPERIMENT

This chapter marks the start of the data collection process. In the next three chapters, the thesis will explain how the data was collected and how the results were analysed to test the research hypotheses. The current chapter describes the preparation that was completed before the commencement of the two field experiments. The purpose of the current chapter is twofold. Firstly, it discusses the steps involved in the preparation of the research survey. The discussion focuses on the construction of the research questionnaire, the presentation, the format, the wording, and the general readability of the survey.

Secondly, the current chapter describes the pilot experiment. The primary purpose of the pilot experiment was to pre-test the research survey. Data collected from pilot participants provided the input to validate the chosen research scales.

ETHICAL CONSIDERATION

The experiment is part of a research project that has been approved by the Human Research Ethics Office at the University of Western Australia. The approval was granted on the basis that the proposed research protocol fulfils strict requirements for research conducted with human subjects. The approval can be found in Appendix A.

The original research was intended to use coupon redemption instead of price discounts as the mean to test the effects of percentage versus dollar based framing. However, after consultation with all participating retailers around the practicality of coupon promotions, it appeared that the delay in monetary redemption of this tactic might not work well for these businesses. Hence, price discount was accepted as an
alternative because it would allow the retailers to manage the implementation of the research better. This was considered a small issue given the research’s aim is to test consumer response to the formats of saving value whether they are carried by coupons or in-store price discounts.

SURVEY PREPARATION

Data Collection context

In Australia, the consumer food service industry is very competitive. In 2011, 30 major food and beverage chains operated 10,719 outlets across Australia, while another 2,876 outlets are operated independently (Euromonitor 2013). The number of these convenient food and beverage outlets in Australia has nearly trebled in the ten years to 2012 (BIS Shrapnel 2013). On average, Australians spend over $2,000 a year on convenient foods and beverages, compared to the global average of just $360 (Euromonitor 2013). The consumer food service industry in Australia is estimated to be worth about $47.2 billion currently and is expected to grow to $49.2 billion in 2016 (Euromonitor 2013).

This thesis conducted two field experiments at two franchised food and beverage outlets, a coffee shop and a fast-food restaurant. These establishments provide quick-service food and beverages to customers. They tend to have limited menu options, fast service, relative low prices, and self-service facilities (Robichau and Khan 1988). In Australia, the consumer foodservice industry is dominated by large franchise names such as McDonald’s, KFC, and Hungry Jacks for fast-food outlets and The Coffee Club and Gloria Jeans for beverage options.
Methodology

This thesis used an experimental design. The use of experimental design has been proven to be very popular among research of discount framing (Krishna et al. 2002). The use of the experimental approach allows the test of the effect of the discount frame and discount rate on consumer responses to price promotion. In some cases, strictly designed experiments permit the interpretation of causal relationships between certain variables whilst holding others constant (Zikmund et al. 2011).

This thesis measured buyer responses using both survey and store sales data. The surveys were administered with voluntary customers who encountered the test promotions. Inputs from these surveys captured buyers’ perceived value and their estimates of internal reference price. On the other hand, the store sales data measured the actual purchase behaviour. By using both survey and store sales data, this thesis was able to provide a comprehensive interpretation of the effect of discount framing.

Using the survey as the key instrument for data collection entailed some limitations. First, only voluntary buyers completed the questionnaire. Therefore, the findings from the surveys at best represented the viewpoints of a subset of buyers who participated in the survey. In addition, administering the survey in real-world environments might expose the survey findings to a host of biases including no responses and socially desirable responses (Cavana, Delahaye, and Sekaran 2001).

On the other hand, the method of using an in-store survey is considered a quick and efficient way of obtaining responses given the current research design. It generates a higher participation rate, compared to other survey alternatives such as take-home questionnaires. In addition, administering an in-store survey allows the researcher to clarify questions from participants when they arise (Zikmund et al. 2011).
Survey Design

The questionnaire in this thesis captured consumers’ responses to price promotions. Inputs from this survey formed the basis for testing discount framing effects. A discount framing effect occurs when subjects respond differently to a percentage-off frame, compared to a dollar-off frame. There are three types of framing effects that were measured by the current survey (1) customers’ perceived value, (2) their estimates of internal reference price, and (3) the reported purchase (see Appendix C for an example of a survey used in this research). A discount framing effect is said to occur when the respondents’ ratings indicate significant differences between a percentage-off discount and a dollar-off discount in either perceived value, estimate of internal reference price or reported purchase.

Construct Operationalisation

Perceived value

Perception of a deal value is an evaluation of a purchase that takes into account what one gives and what one gets (Lichtenstein, Burton, and Karson 1991; Thaler 1985; Zeithaml 1988). This notion represents a mental trade-off that a buyer makes between the purchase’s benefits and its costs, or between the benefit s/he could realise in a product relative to the sacrifice s/he makes by paying the price (Grewal, Monroe, and Krishnan 1998; Monroe 2003).

The current questionnaire used the perceived scale from the Grewal et al.’s research (1998). The original scale comprises six items. Grewal et al. (1998) reported a Cronbach’s alpha of .90 for their perceived value scale when tested with purchase of a bicycle. Using a similar scale, Dodds, Monroe, and Grewal (1991) reported coefficient alphas of .95, with average inter-item correlations of .78.
In the current research, the perceived value construct was measured with a 5-point Likert scale that was anchored by one as “strongly disagree”, and five as “strongly agree”. This format has also been adopted by previous studies in the discount framing literature (e.g., Chen, Monroe, and Lou 1998; DelVecchio, Krishnan, and Smith 2007).

**Internal reference price**

Internal reference price (IRP) is an internal standard which one uses to compare against the prices s/he observes in the marketplace (Kalyanaram and Winer 1995). It has been shown that frequent exposures to discount promotions could affect the reference price consumers use to evaluate a product (e.g., Alba et al. 1999; Kalwani and Yim 1992). Consequently, the buyers’ estimates of IRP are expected to change after exposures to discount prices.

A four-item scale was adapted from Chandrashekaran and Grewal (2006) to form an index of internal reference price. The original operationalisation of the construct was based on the three aspects: a fair price, a normal price, and a reservation price (i.e., the highest and lowest prices one is willing to pay). The scale was demonstrated to be reliable ($\alpha = .88$; average item-to-total correlation $r = .74$) in the original research and elsewhere (Lichtenstein, Burton, and Karson 1991; Folkes and Wheat 1995; Lowe and Barnes 2012; Thaler 1985). In congruence to previous studies, the current scale of internal reference price was measured by an open-ended format.

**Reported purchase**

Reported purchase occurs when buyers indicate that they have bought the discounted items. In the survey, reported purchase was measured by a dichotomous item (i.e., yes/no) that allowed buyers to state whether or not they had purchased the promoted brand.
The reported purchase measured by the current survey is not the same as the actual purchase. Reported purchase using the survey method could only capture the purchase behaviour of survey buyers. These buyer respondents might not represent the complete pool of buyers who had purchased the promoted items. However, the reported purchase measure was deemed useful because it could be collected together in the survey with evaluative responses (i.e., internal reference price and perceived value). To make up for the weakness of the reported purchase measure, this thesis also collected sales data to capture more accurately the discount framing effect on purchase behaviour.

**Demographics and store visit frequency**

Apart from the three key measures of discount framing effect, buyers’ purchase experience with the product category was measured through their frequency of visiting the retail food and beverage outlets. Buyers estimated the number of times they had been to these venues in the previous four weeks. The survey used in the subsequent field experiments also included a question that measured buyer’s frequency of visiting the store. However, this question was not presented in the pilot survey because the key purpose of this pilot experiment was not to test for specific store context but rather was to validate the scales used in the questionnaire.

Information about buyers’ frequency of visiting the store serves two purposes. First, it would help the participating store to understand their customer purchase patterns better. Second, an interesting aspect when studying fast-food restaurant is the significant presence of regular customers at the store (Richards and Padilla 2009; Taylor 2001). This is an area where past research in packaged good retail has discovered significant results in relation to the differences between heavy (regular) and light (irregular) buyers and their responses to sales promotions (Ehrenberg, Uncles, and Goodhardt 2004; Schmittlein, Cooper, and Morrisson 1993). In other words, past purchase history at the
store could have an impact on customer response to current discount promotions. Being able to control for the impact of past purchase frequency would allow more accurate interpretation on the effects of discount framing on customer response to discount promotions.

Lastly, the survey also collected data on buyers’ background and their consumption experience. Demographic items included participants’ gender and age. Most buyers were expected to have an adequate recollection of their experience to respond to this question (Ehrenberg, Uncles, and Goodhardt 2004).

**Survey Format**

The researcher conducted observations at the participating retailers as part of the questionnaire design process. It was found that customers, on average, needed to wait approximately five minutes before their foods and beverages were ready. This is the window of time during which surveys can be completed.

The short timeframe and the nature of collecting data before the consumption may impact on the content of the questionnaire. Based on previous experience, the store owners suggested that the shorter the survey, the more likely customers would agree to complete it. It was also essential to present the survey in a user-friendly format. Survey format can be improved through presentation and wording.

In order to improve the presentation of the questionnaire, the survey form was printed on an A6-sized paper (105mm x 148mm). The compact size of the survey was deemed easier to handle. In addition, a small-sized questionnaire presentation was found to be quite effective in surveying customers previously at one of the participating stores. In subsequent field studies, these questionnaires were attached on mini-clipboards to further ease the survey completion.
The wording of items in the survey was made as unambiguous as possible. While composing the questionnaire, the researcher paid particular attention to minimise vague questions and lengthy items. To further improve wording and format of the questionnaire, a pre-test was carried out with marketing academics, who had extensive experience in conducting consumer research. See Appendix C for an example of a survey used in this research project.

**Preliminary Test**

A preliminary test was conducted to check potential issues with the questionnaire, including face validity and readability. Participants were six doctoral candidates and one academic staff member who work in the marketing discipline at the University of Western Australia. They were asked to comment on the draft version of the survey.

The pre-test participants suggested that the fair price item and the normal item in the internal reference price scale both capture the same notion of average price. Using of both items was deemed to be redundant. As a result, the internal reference price scale was reduced from four to three items. The updated version was returned to all respondents for further comments. The final version of the perceived value scale and the internal reference price scale are presented in Table 2.
**TABLE 2**
Perceived Value, Internal Reference Price and Reported Purchase Measures

<table>
<thead>
<tr>
<th>Scales</th>
<th>Items</th>
<th>Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived value</td>
<td>This muffin promotion is a great deal</td>
<td>Five-point Likert scale</td>
</tr>
<tr>
<td></td>
<td>The sale price is less than what I expect it to be</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At this price I would save a lot of money</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The sale price is less than what other retailers charge</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The promotion appears to be a bargain</td>
<td></td>
</tr>
<tr>
<td>Internal reference price</td>
<td>The most you are willing to pay for a muffin</td>
<td>Open-ended scale</td>
</tr>
<tr>
<td></td>
<td>The price you consider acceptable for a muffin</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The least you expect to pay for a muffin</td>
<td></td>
</tr>
<tr>
<td>Reported purchase</td>
<td>Did you take advantage of the price promotion available in-store today?</td>
<td>Yes/No</td>
</tr>
</tbody>
</table>
PILOT EXPERIMENT DESIGN

Purpose of Experiment

**Scale validation**

The key purpose of the pilot study was to examine the reliability of the two dependent measures in the survey. One criterion to judge the reliability of a scale is its stability. The scale needs to be free from biases and random errors in order to yield consistent results across different testing occasions (Cavana, Delahaye, and Sekaran 2001). As discussed in the operationalisation section, the scales chosen for this questionnaire were adapted from previous research where they showed satisfactory reliability.

A second criterion to judge the scale reliability is its internal consistency. This can be obtained from Cronbach’s alpha index, item-to-item and item-to-total correlations (Zikmund et al. 2011). When Cronbach’s alpha is low (less than 0.7), and when individual items correlate modestly to the total construct and to each other, the scale indicates low internal consistency (Nunally 1978). This means that individual items in the scale may not capture the same underlying construct.

**Testing the Effects of Discount Rate on Participant Responses**

Data collected from the pilot experiment also allowed testing for the effect of the discount rate on buyer responses. It was expected that a small and a moderate discount rate should be distinguished by survey participants. In particular, the moderate discount rate was hypothesised to generate more favourable perceived value and lower estimate of internal reference price than the small discount rate.
Past research has provided consistent findings on what buyers perceive as small and moderate discount rates, at least for low-cost products (e.g., Darke, Chaiken, and Freedman 1995; Grewal, Marmostein, and Sharma 1996; Hardesty and Bearden 2003). In their investigation of the effect of the discount rate on consumers’ perceived value, Grewal, Marmorstein, and Sharma (1996) showed that 16.7%, 28.6%, and 50% reductions from regular retail price of a t-shirt represented low, moderate and high discount rates respectively. Recently, Hardesty and Bearden (2003) used 10%, 25%, and 50% price reduction to represent small, moderate, and high discount rates for a range of grocery products.

In line with the Hardesty and Bearden (2003) study, this thesis selected 10% and 25% price reductions to represent small and moderate discount rates respectively. Using more complicated discount rates such as the ones employed by Grewal, Marmorstein, and Sharma (1996) increases the perceived difficulty in estimating purchase value. This consequently could introduce some biases because some consumers may become suspicious about the authenticity of the price promotion (Lichtenstein and Bearden 1989). This in turn has effects on respondents’ evaluations and purchases of the discount brands. Accordingly, simple 10% and 25% discount rates were chosen as small and moderate discount rates in the current research.

Participants were expected to perceive a 25% discount rate to offer significantly higher purchase value than a 10% discount. In addition, they were expected to have a significantly lower estimate of internal reference price (IRP) to a greater degree after seeing a 25% discount promotion, compared to a 10% discount promotion.
Experimental Design

*Design*

The current experiment was a between-subject design, using discount rate (small vs. moderate) as the predicting variable, and the perceived value and the internal reference price as the criterion variables. The test product was a premium-grade muffin, costing $4 at regular retail price. The product type and the price level were the same as those tested in the first field experiment.

*Instrument*

Survey was the method to collect data in the pilot experiment. Two questionnaire versions were created that corresponds to the small (10%) and moderate (25%) discount conditions. The questionnaires used in this experiment can be found in Appendix B.

The survey contained scales that captured participants’ perceived value and their estimates of internal reference price. Pilot participants were asked to read a short description of a hypothetical purchase scenario before completing the questionnaire.

Moderate discount rate condition: “Imagine you are visiting a food court inside a large shopping centre. A coffee shop is having a promotion that gives you 25% discount on its “Premium Delight” muffin which usually costs $4. The discount is equivalent to $1. Please rate this promotion.”

Small discount rate condition: “Imagine you are visiting a food court inside a large shopping centre. A coffee shop is having a promotion that gives you 10% discount on its “Premium Delight” muffin which usually costs $4. The discount is equivalent to 40 cents. Please rate this promotion.”
The key section of the survey measured participants’ perceived value, and their estimates of IRP. The perceived value construct was gauged with a five-point Likert scale, anchoring by 1 as strongly disagree, and 5 as strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>This muffin promotion is a great deal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what I expect it to be</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>At this price, I would save a lot of money</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what other retailers charge for similar products</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The promotion appears to be a bargain</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

The internal reference price construct was measured with an open-ended format in that participants indicated their estimates for three price items.

- The most you are willing to pay for this type of muffin: $__________
- The price you consider acceptable for a similar muffin: $__________
- The least you expect to pay for a similar muffin: $__________

Finally, the survey collected data on age and gender to capture participants’ demographic background. In addition, it included two items to gauge respondents’ experience with visiting coffee shops in general.

- Gender: ☐ Male ☐ Female
- Age: ________________ years
- Frequency of visiting coffee shops: ________ times/past 4 weeks
Sampling

A convenience sample of post-graduate students was chosen for this experiment. These adult consumers were expected to be familiar with convenient food and beverage products. The choice of convenience sampling is appropriate given the key purpose of the pilot study is validating research scales rather than hypotheses testing.

Experimental Procedure

Data was collected in August 2012. The surveys were administered in a break during a marketing lecture at the University of Western Australia. Participation in this survey was completely voluntary.

The two discount treatments were implemented by systematically distributing questionnaires to participants. The researcher interspersed the two survey versions so that for every small (10%) version of the survey handed, a moderate (25%) version was followed. Doing so would ensure an approximately equal number of surveys in each experiment condition. The surveys were self-administered.
PRELIMINARY DATA ANALYSIS

Data Cleaning and Missing Value Analysis

Data from the pilot experiment was entered into Microsoft Excel for preliminary processing and then transferred into SPSS for in-depth analyses. Little’s MCAR test was performed to check whether missing data in the surveys could affect the findings. Because all missing values appeared to be random (all \( p > .12 \)), they were replaced using an expectation-maximisation algorithm.

Participant Information

Twenty-seven students participated in the pilot study. The mean age of these subjects was 24.8 years (SD = 2.5). The age difference between participants in the two experimental conditions was not significant (F(1, 25) = 3.33, \( p > .05 \)).

The number of subjects that completed each version of the questionnaire was roughly the same, 48.1% (n= 13) in the small discount condition and 51.9% (n= 14) in the moderate discount condition.

Female participants accounted for 65.4% (n=17) of the sample whereas male participants accounted for 34.6% (n = 9) of the sample. No significant difference was found in the gender ratio between the two experimental conditions (\( \chi^2 (1) = 1.53, p > .12 \)).

Participants reported visiting coffee shops six times in the previous four weeks (\( M = 6.0, SD = 5.7 \)). The visit frequency to cafes did not differ between participants in each of the two experimental conditions (\( F (1, 25) = .68, p > .12 \)).
SCALE VALIDATION

The first purpose of the pilot experiment was to examine the reliability of the two dependent measures; perceived value and IRP. Cronbach’s alphas and item-to-total correlations for the two dependent measures were analysed with the SPSS software. These indices helped determine whether the perceived value and the internal reference price scales were reliable.

TABLE 3
Reliability of Perceived Value and Internal Reference Price Measures in Pilot Experiment

<table>
<thead>
<tr>
<th>Scale</th>
<th>Item</th>
<th>Item-to-total correlation</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived value</td>
<td>This muffin promotion is a great deal</td>
<td>.76</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td>The sale price is less than what I expect it to be</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td></td>
<td>At this price I would save a lot of money</td>
<td>.72</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The sale price is less than what other retailers charge</td>
<td>.57</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The promotion appears to be a bargain</td>
<td>.59</td>
<td></td>
</tr>
<tr>
<td>Internal reference price</td>
<td>The most you are willing to pay for a muffin</td>
<td>.67</td>
<td>.84</td>
</tr>
<tr>
<td></td>
<td>The price you consider acceptable for a muffin</td>
<td>.73</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The least you expect to pay for a muffin</td>
<td>.68</td>
<td></td>
</tr>
</tbody>
</table>

Table 3 shows that the two scales used in the pilot survey were reliable. Both scales demonstrated high Cronbach’s alphas (both \( \alpha > .80 \)), with moderate to strong item-to-total correlations (\( .57 < \text{both } r < .76 \)).
Because the scales had good reliability and strong internal consistency, the two average scores that represent perceived value and internal reference price concepts were created with equal weighting. These scores represented each of the two dependent measures in subsequent analyses. For the perceived value variable, the average scores were bounded between one and five. For the internal reference price variable, the average scores demonstrated the average estimates of internal reference price for muffin after buyers were exposed to the discount promotion.
MANIPULATION CHECK

Analysis Plan

An additional benefit of conducting the pilot experiment was the available data that allows the researcher to assess the effects of the discount rate on student responses. Findings from this small data set would provide an indication on the validity of the discount rate manipulation. If the discount rate manipulation is effective, participants in the moderate discount condition are expected to have a lower estimate of IRP and higher perceived value for the discounted muffins than participants in the small condition. Because both perceived value and IRP were measured with metric scales, examining the effects of the discount rate on these variables requires the analysis of variance technique.

A multivariate test was conducted to allow a more conservative test of the effects of the discount rate on the two dependent variables. This is because analysing the perceived value and the IRP variables separately could risk inflating type I errors (i.e., rejecting null hypothesis when null hypothesis is true) in the findings (Hair et al. 2006). If the perceived value and the IRP variables are analysed separately, there are higher chances of observing significant relationships between them and the independent variables. As a result, examining the effect of the discount rate on perceived value and IRP was conducted using a multivariate analysis of variance or MANOVA.
Test Assumptions

Several test assumptions need to be satisfied before the results of MANOVA can be interpreted reliably. First, the checks for univariate normality of the two dependent variables showed satisfactory results (Table 4). The descriptive and visual outputs from SPSS indicated no violation of normality.

Second, the 5% trimmed means of the two dependent variables were compared against their normal means to check the impact of outliers in the overall data. For each dependent variable, a 5% trimmed mean is obtained from 95% of the observations that exclude 2.5% of the observations at the highest and lowest ends of the data range. When a 5% trimmed mean does not deviate substantially from a normal mean (i.e., 100% observations), outliers are not an issue in the data.

Table 4 indicates that the 5% trimmed means of perceived value ($M = 2.81$) and of internal reference price ($M = 2.98$) were similar to their normal means ($M_{\text{perceived value}} = 2.80$; $M_{\text{IRP}} = 3.01$). Thus, outliers were not an issue for both dependent variables.

| TABLE 4 |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| **Descriptive Statistics for Dependent Variables in Pilot Experiment** | **Mean** | **5% trimmed mean** | **S.D** | **Skewness** | **Kurtosis** |
| **Statistic** | **S.E** | **Statistic** | **S.E** | **Statistic** | **S.E** | **Statistic** | **S.E** |
| Perceived value | 2.81 | .15 | 2.80 | .77 | .14 | .45 | .14 | .87 |
| Internal Reference Price | 2.98 | .15 | 3.01 | .79 | -.68 | .45 | .97 | .87 |

S.E- standard error, S.D- standard deviation
Third, scatterplots were generated from the SPSS programme to check whether the relationship between the two dependent variables (i.e., perceived value, IRP) was linear across the two levels of the discount rate. The results showed no evidence of a non-linear relationship between IRP and perceived value across the low and moderate levels of the discount rate. Therefore, the test for linear assumption was satisfied.

Fourth, the largest Mahalanobis distance in the current dataset was 8.9. This was less than the critical value of 13.82 that is suggested for MANOVA tests with two dependent variables (Pallant 2007, p.280). Thus, there were no multivariate outliers in the data.

Fifth, in order to test for violation of the assumption of equal variances, Levene’s tests were used. The tests showed no significant results (all $p > .12$), which signalled no violation of the equal variance assumption.

Finally, the assumption of homogeneity of variance-covariance matrices was satisfied because the Box’s M test ($p = .57$) was significantly larger than the critical value of .001. In summary, because there were no violations of all the test assumptions, MANOVA test could be used.

**Results**

The MANOVA results showed that the effects of the discount rate on respondents’ perceived value and their estimate of internal reference price (IRP) were not significant ($F(2, 24) = 1.10, p > .12$). This initial result did not lend support for the effects of the discount rate on participants’ responses to discounted muffins.

Nevertheless, the univariate results provided some support for the effect of the discount rate on distinguishing between small and moderate discount rates. The difference in IRP estimates between the two experimental conditions was congruent with this expectation. In particular, respondents reported a higher estimate of IRP after
being exposed to a small discount rate (M = 3.11, SD = .57) than to a moderate discount (M = 2.73, SD = .88), (t(23) = 1.28, p = .21). Moreover, the effect size for this difference was rather large (Cohen’s d = .50). This means that the effects of the discount rate on IRP would be significant in subsequent field experiments when larger samples are tested (Rosenthal and Rosnow 2008).

Additional Findings

Average ratings of perceived value across both the small and moderate discount conditions were below the neutral mid-point in the five-point scale (both M < 3). It appeared that the two discount promotions did not offer attractive values for students in the pilot experiment.

Interestingly, participants’ estimates of IRP were only $2.98 on average. This is significantly lower than the regular retail price (i.e., $4) (t(26) = -6.69, p < .01), and the 10% discount price (t(26) = -4.06, p < .01) of the muffin. However, the average estimate of IRP was similar to the 25% discount price (t(26) = -.11, p > .12). These results imply that a moderate discount price was merely on par with how much participants in this sample expected to pay for a muffin. Therefore, the effect of the discount rate on IRP was non-significant because the deals used in this pilot experiment did not provide actual value to the participants in this study.
CONCLUSION

The current chapter has so far discussed the preparation conducted before the commencement of the two field experiments. The main part of the preparation process was to create a questionnaire to be used in the subsequent field experiments. In addition, a pilot experiment was conducted as part of the preparation process. This experiment was conducted with a group of post-graduate marketing students (n = 27). The key purpose of the pilot experiment was to validate the perceived value and IRP scales that would be used to capture the effects of discount framing in the field experiments.

Summary of Findings

First, the results showed good reliability scores for both the perceived value (α = .84) and the IRP (α = .82) scales. Furthermore, the moderate to high item-to-total correlations suggested that the two scales possessed good internal consistency. Accordingly, the two scales were reliable and were used in the subsequent field experiments.

Interestingly, the results indicated that the discounts did not represent saving value to the students in the pilot experiment. Discount rate did not have significant effects on the student’s perception of the deal value and their estimates of IRP. If the purpose of this pilot experiment were to test for such effects, a larger sample size and a more representative sample would be used. However, given the key purpose of the experiment was to validate the scales in the questionnaire, further elaboration on the results is deemed unnecessary.
CHAPTER FIVE

EXPERIMENT I

The current chapter describes the first field experiment conducted at a franchised coffee shop in Australia. Figure 2 shows the actual layout of the coffee shop. The focus of this experiment was to examine whether discount rate interacts with discount frame in influencing consumer behaviour. It is hypothesised that the effects of percentage versus dollar framing on buyer behaviour are significant at a moderate discount rate (H₃) and but not at a small discount rate (H₄). In addition, Experiment I also tests the effects of the discount rate (H₁) on consumer responses to promoted brand. Finally, the first experiment provides a venue to investigate the relationships between buyers’ perceived value of the promoted brand (H₂) and their estimates of internal reference price (H₃) on sales of the promoted brand.

FIGURE 2

The Coffee Shop Layout
This chapter begins with a discussion of the preparation process for Experiment I, focusing on the experimental design and the instrument design. After that, the actual experimental procedure is described, including illustrations of the research stimuli in a real-life setting. The hypotheses testing is presented in relation to how the discount frame could interact with the discount rate to affect the three dependent measures: perceived value, estimate of internal reference price (IRP), and reported purchase behaviour. Finally, the conclusion section summarises the findings of the first field experiment and outlines the implications for Experiment II.
RESEARCH METHODOLOGY

Experiment Design

This experiment employed a 2 x 2 between-subject design, using discount frame and discount rate to predict consumer responses. The two treatments of the discount rate were a 10% and a 25% price reduction, representing small and moderate discount rates. The two treatments of discount frame were a percentage-off format and a dollar-off format. The experimental design resulted in four experimental treatments, each of which was implemented as an individual price promotion. In each condition, data was collected using in-store surveys with customers.

TABLE 5

Experimental Conditions in Experiment I

<table>
<thead>
<tr>
<th>Order</th>
<th>Manipulation</th>
<th>Promotion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Small discount rate, dollar-off frame</td>
<td>regular $4, 40 cents off</td>
</tr>
<tr>
<td>Week 2</td>
<td>Small discount rate, percentage-off frame</td>
<td>regular $4, 10% off</td>
</tr>
<tr>
<td>Week 3</td>
<td>Moderate discount rate, percentage-off frame</td>
<td>regular $4, 25% off</td>
</tr>
<tr>
<td>Week 4</td>
<td>Moderate discount rate, dollar-off frame</td>
<td>regular $4, $1 off</td>
</tr>
</tbody>
</table>

The test price promotions were implemented in the order outlined in Table 5. The two small discounts (regular $4, 10% off and regular $4, 40 cents off) were available prior to the two moderate discounts (regular $4, 25% off and regular $4, $1 off). This order of testing would prevent the potential bias that occurs when a high price promotion prompts customers to come back to the store the following weeks only to find a lower discount. Between the two small price promotions, the dollar-off deal (“40 cents off”) was promoted before the percentage-off deal (“10% off”). Between the
two moderate price promotions, the order was reversed in that the percentage-off deal ("25% off") was made available before the dollar-off deal ("$1 off").

**Instrument Design**

The product chosen for this experiment was a range of premium muffins. This range comprises five varieties that were all discounted. These premium muffins cost $4 each in normal retail price.

**Display**

A professional graphic designer prepared the display stimuli for the current experiment. The displays were produced based on an advertising poster which was used to promote the same product range in a previous advertising campaign. By using the same marketing materials that had been employed by the franchise previously, the current study ensured that the research stimuli resembled the actual promotion materials seen by consumers.

The chosen poster was digitally enhanced in two steps. First, the discount information was placed onto the photo (e.g., "$1 off"). Second, the purchase terms and conditions were positioned at the bottom of the poster. The displays were A3-sized (420mm x 297mm) featuring the picture of the premium muffin range and the price promotion. Figure 3 shows an example of a poster that was used in Experiment I.
FIGURE 3

Example of a Display in Experiment I
**Signs**

To increase customers’ awareness of the discount promotion, plastic signs were used in addition to in-store display stands. These signs were attached to the baskets that carried the promoted muffin range.

**FIGURE 4**

Examples of Sign in Experiment I

**Wall menu**

Many consumers use price information on the wall menu to assist in making purchase decision at the coffee shop. Due to a large number of items available, the coffee shop does not provide specific prices for individual muffins. Instead, the wall menu states that the minimum price for all muffin starts from $4 (Figure 5). Consumers could check with the store staff to get the regular price of any products before making their purchase decision. If so, they could find out that the regular price of a promotional muffin is $4.

Alternatively, it was possible that some customers could adopt $4.00 as the regular price for the promotional muffins. This is because many buyers, especially the frequent users, were cognizant that price differences among varieties of muffin are quite small.
FIGURE 5
Wall Menu at the Coffee shop
Survey

The questionnaire was adapted from the version that was used in the pilot experiment. Four versions of the survey were created, one for each of the experimental conditions. The structure of these surveys was substantially similar. First, a dichotomous question appeared at the beginning of the survey to gauge the reported purchases of buyers.

Did you take advantage of the “<discount frame> Premium Delight muffin” promotion today?

☐ Yes (please continue)
☐ No (please observe the promotion and rate it honestly)

Central to the survey was the measures of buyers’ perceived value of the discounted item and their estimates of internal reference price. The perceived value construct was measured with a five-point Likert scale, anchored by 1 as strongly disagree and 5 as strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>This muffin promotion is a great deal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what I expect it to be</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>At this price, I would save a lot of money</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what other retailers charge for similar products</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The promotion appears to be a bargain</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
The internal reference price (IRP) construct was measured in an open-ended format where buyers indicated their price estimates for three price items.

| The most you are willing to pay for this type of muffin | $__________ |
| The price you consider acceptable for a similar muffin | $__________ |
| The least you expect to pay for a similar muffin | $__________ |

The survey collected data on age and gender to represent buyers’ demographic background. In addition, it included two items to gauge respondents’ experience in visiting the current coffee shop and coffee shops in general.

<table>
<thead>
<tr>
<th>Gender</th>
<th>☐ ☐ Male</th>
<th>☐ ☐ Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age:</td>
<td>___________ years</td>
<td></td>
</tr>
<tr>
<td>Frequency of visiting Muffin Break Carousel:</td>
<td>___________ times/past 4 weeks</td>
<td></td>
</tr>
<tr>
<td>Frequency of visiting coffee shops (incl. Muffin Break):</td>
<td>___________ times/past 4 weeks</td>
<td></td>
</tr>
</tbody>
</table>

Finally, buyers were instructed to provide their contact details at the back of the survey form to enter into a random draw to win one of five $30 store vouchers. The random draw was meant to encourage participation in the survey. For all visual displays and surveys used in Experiment I, refer to Appendix C.
Sampling

Sampling frame

The sampling frame for the survey included all buyers who made purchases at the coffee shop. The current experiment used a systematic sampling method, in that the interviewer approached every second customer that had paid for his/her purchase at the cashier. On average, around half of the customers approached agreed to participate in this survey. This makes the response rate of 50%. This method helps control for interviewer’s bias, which can occur when the interviewer only chooses to approach buyers that seem open to the survey activity (Rosenthal and Rosnow 1991).

Sampling procedure

During the survey period, buyers who shopped at the coffee shop were systematically approached by the researcher. The researcher monitored customers who had paid for their purchases at the cashier and approached every second buyer. The researcher then initiated the contact with the buyers when they were waiting for their orders. Participation in the survey was voluntary. Buyers who had completed the surveys were not asked to re-do the survey. This was to avoid respondent duplication in the survey data.

Sample size

The unique challenge of collecting data in a real-life consumption environment is that there is only a brief window of time available for completing surveys. On average, the duration available for data collection is five minutes during which customers are waiting for their orders. The brief available time could hinder buyers’ willingness to complete the survey. In fact, some buyers were reluctant to participate in the study citing that doing so would interfere with their consumption.
To improve participation, surveys were administered during the busiest trading hours at the coffee shop, from 9am to 12pm. The target was to recruit at least 30 buyers for each experimental condition. This sample size is similar to those used in previous research (e.g., Della Bitta, Monroe, and McGinnis 1981; Hardesty and Bearden 2003).

**Addressing Potential Biases**

The research design strived for constancy in data collection to minimise artefacts and biases which could distort research findings (Zikmund et al. 2011). Across all experimental conditions, surveys were administered around the same time, from 9am to 12pm on Tuesdays. This was to ensure that the pools of participants were similar across all four experimental conditions.

Moreover, the data collection was conducted during the period that did not interfere with school or public holidays. This was to avoid including many unintended customers in the data collection. The discount aimed at normal buyers who visit the store all year round. Conducting surveys during the school and public holidays may attract different groups of customers, who may not visit the store often outside the holiday periods.

Although preserving constancy between all conditions aims to minimise the impact of nuisance variables on the findings of Experiment I, not all nuisance variables could be controlled. For instance, customers visit the store during the busy morning hours could exhibit different purchase behaviour than those come to the coffee shop during less busy time in the afternoon. Thus, the results of Experiment I might not reflect truly how all customers from the coffee shop would respond to the discount promotions. Nevertheless, it would be very challenging, if not possible, for field experiments to control for all nuisance variables. The current design in Experiment I aims to account for most nuisance variables whilst maintain the feasibility of the study.
DATA COLLECTION PROCEDURE

Overview

The data was collected from a franchised coffee shop. This coffee shop is situated in the premises of one of the biggest shopping centres in Western Australia. The shopping centre is located 12km south of Perth’s central business district and attracts around 10.6 million visitors annually (Westfield 2013). The retailer sells coffee and a range of sweet and savoury pastries. The store opens seven days a week from 9am until 5pm and extends the hours until 9pm on Thursdays. The store is located in the food court area with a seating capacity of 1,200 people. The coffee shop attracts both local residents and customers from neighbouring areas. The store’s annual turnover has been in the $700,000 to $1,000,000 range since it opened six years ago.

The study began in August and was completed in September 2012 during which four different discount promotions were tested. These price promotions were visible to store patrons through in-store displays and signs. However, surveys were administered only on Tuesdays between 9am and 12pm.
Displays, Signs and Menu

In each experimental condition, two identical display stands were used. One display was placed on top of the refrigerated cabinet in which the promoted muffins were shown, while the other one was placed next to the cashier where most customers first approached the store.

To further enhance the exposure of the promotions, plastic signs were used. These signs were attached to the baskets carrying the promoted muffins. For customers who contemplated their choices by looking into the display cabinet, these signs attracted their attention to the available promotions. Participants could check the muffin price by looking at the wall menu or ask the staff directly. Figure 6 illustrates how displays and signs were arranged in Experiment I.

FIGURE 6
Example of Display and Signs in Experiment I (“$1 off” condition)
Customer Survey

The data collection took place during the four-week period between August and September 2012. Surveys were administered to store patrons who visited the coffee shop during the hours between 9am and 12pm on Tuesdays.

The researcher approached store patrons and asked if they would like to participate in the survey. The researcher explained to buyers that the survey was the retailer’s initiative to understand buyers’ perceptions of the current promotion. It was emphasised to buyers that their participation in the survey was voluntary and the information provided would remain completely confidential.

To ensure that no buyers completed the survey twice, a filtering procedure was employed. Particularly, the researcher first asked buyers whether they had participated in the questionnaire before. If the buyers suggested that they had not seen the survey, they were then asked whether they would like to complete the survey. If the shoppers indicated that they had indeed done the survey earlier, they were not asked to complete the survey again.

The researcher handed survey forms to the buyers who agreed to participate. The researcher kept monitoring the progress of questionnaire completion whilst continuing to approach new customers. Surveys were provided on mini-clipboards with pens attached. When completed, buyers placed their surveys in the competition box to enter the draw to win one of five $30 store vouchers.

The respondent’s contact details were only used for the competition and were not entered into the data analysis. Therefore, the respondent identities were anonymous to the researcher when analysing the data.
PRELIMINARY DATA ANALYSIS

Data Processing

Data entry and cleaning

The data from surveys was entered into Microsoft Excel for preliminary processing and then was transferred into the SPSS programme for in-depth analyses. Survey forms with a large proportion of missing values were excluded from further processing. In the end, a sample size of 213 respondents was retained for the study.

Missing data analysis & imputation

Little’s MCAR tests indicated that missing data in the survey appeared to be random (all \( p > .12 \)). This permitted imputing the missing values with new values for all continuous variables.

Descriptive Statistics

Participant information

Table 6 shows that the number of survey respondents varied across the four experimental conditions, with the lowest number in the “10% off” condition (n = 39) and the highest number in the “40cents off” condition (n = 67).

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Purchase discounted muffin</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>40cents off</td>
<td>6</td>
<td>61</td>
</tr>
<tr>
<td>10% off</td>
<td>3</td>
<td>36</td>
</tr>
<tr>
<td>25% off</td>
<td>12</td>
<td>33</td>
</tr>
<tr>
<td>$1 off</td>
<td>12</td>
<td>50</td>
</tr>
</tbody>
</table>

TABLE 6

Participant Information in Experiment I
Among 213 buyer respondents, 33 of them (15.5%) reported buying the promoted muffins. Only three respondents bought the promoted muffins in the “10% off” condition and six of them did so in the “40 cents off” condition. The number of shoppers who purchased the discounted muffins increased to 12 in both the “25% off” condition and the “$1 off” condition. Table 7 demonstrates the proportions of buyers in each of the four experimental conditions that purchased the promoted muffins.

**TABLE 7**

Proportions of survey buyers purchased the promoted muffins in Experiment I

<table>
<thead>
<tr>
<th></th>
<th>Small (10%)</th>
<th>Moderate (25%)</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Percentage-off</strong></td>
<td>7.7%</td>
<td>26.7%</td>
<td>17.9%</td>
</tr>
<tr>
<td><strong>Dollar-off</strong></td>
<td>9%</td>
<td>19.4%</td>
<td>14%</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td>8.5%</td>
<td>22.4%</td>
<td>15.5%</td>
</tr>
</tbody>
</table>

Buyers reported they had visited the coffee shop on average five times (M = 5.2, SD = 6.4), and had been to all coffee shops eight times (M = 7.9, SD = 8.0) in the four-week period prior to the survey. The two visit frequency measures were highly correlated to each other (r = .80). This would lead to redundancy when both variables are used in the same analysis. Consequently, only store visit frequency was chosen for further tests. This allows the consistent interpretations of the results because all variables in the analyses refer only to the current coffee shop.
Scale validation

The measures of both the perceived value construct and the internal reference price (IRP) construct showed good levels of reliability at the experiment condition level, and at the aggregate study level. All coefficient alphas exceeded the commonly accepted threshold of .70 (Nunnally 1978).

TABLE 8

Reliability of Perceived Value and Internal Reference Price Measures in Experiment I

<table>
<thead>
<tr>
<th>Experimental condition</th>
<th>Perceived value</th>
<th>Internal reference price</th>
</tr>
</thead>
<tbody>
<tr>
<td>40cents off</td>
<td>.84</td>
<td>.89</td>
</tr>
<tr>
<td>10% off</td>
<td>.87</td>
<td>.87</td>
</tr>
<tr>
<td>25% off</td>
<td>.85</td>
<td>.89</td>
</tr>
<tr>
<td>$1 off</td>
<td>.88</td>
<td>.88</td>
</tr>
<tr>
<td>Experiment (overall)</td>
<td>.87</td>
<td>.88</td>
</tr>
</tbody>
</table>

Table 8 illustrates the reliability indices for individual experimental conditions and the overall study. The internal consistencies were satisfactory because the magnitude of item-to-total correlations were moderate to high for both the perceived value construct (.62 < r < .75) and the IRP construct (.70 < r < .86). Given the satisfactory internal consistencies obtained for both dependent measures, composite scores were created for both constructs using averaging method with equal weighting for individual items in the scales. These mean scores represented the perceived value and the IRP variables in subsequent analyses in this experiment.
Distributions of dependent variables

Normality checks for the distributions of the dependent variables were assisted by the descriptive and visual outputs from the SPSS software. Descriptive statistics including central tendency (i.e., mean), dispersion (i.e., standard deviation) and distribution shape (i.e., kurtosis, skewness) determine if the distribution of a variable deviates from the normal distribution (Cavana, Delahaye, and Sekaran 2001). In addition, the skewness value denotes the symmetry of the distribution while the kurtosis value represents the relative peakedness or flatness of a distribution. If the data is normally distributed, these two indices are approximate to zero (Pallant 2007). Furthermore, histograms, box-plots, and normality plots provide a visual demonstration to judge normality.

For perceived value construct, the descriptive and visual outputs indicated that its distribution resembled normality. Table 9 indicates that the average rating of perceived value (M = 3.83) was greater than the mid-point in a five-point scale, signalling that most respondents considered the price promotions favourably. For IRP construct, the descriptive and visual outputs from the SPSS software indicated that its distribution resembled normality. Buyers estimated their IRP was lower than the regular retail price ($3.75 < $4.00). The 5% trimmed mean (M_{trimmed} = 3.75) was not significantly different from the normal mean (M = 3.75), indicating that outliers were not a significant issue.

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>5% trimmed mean</th>
<th>S.D</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Statistic</td>
<td>S.E</td>
<td>Statistic</td>
<td>Statistic</td>
<td>S.E</td>
</tr>
<tr>
<td><strong>Perceived value</strong></td>
<td>3.83</td>
<td>.05</td>
<td>3.83</td>
<td>.68</td>
<td>.17</td>
</tr>
<tr>
<td><strong>Internal reference price</strong></td>
<td>3.75</td>
<td>.05</td>
<td>3.75</td>
<td>.71</td>
<td>-.12</td>
</tr>
</tbody>
</table>
Nuisance variables

Age, Gender, and Store Visit Frequency

The mean age of participants in Experiment I varied across the four experimental conditions (Table 10). Subjects who encountered the small (10%) discounts during the first two weeks of the study period were younger than those who saw the moderate (25%) discounts during the last two weeks ($F(1, 206) = 5.36, p < .05$).

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1- 40c off</td>
<td>40.15</td>
<td>14.25</td>
</tr>
<tr>
<td>Week 2- 10% off</td>
<td>41.64</td>
<td>17.02</td>
</tr>
<tr>
<td>Week 3- 25% off</td>
<td>48.72</td>
<td>18.20</td>
</tr>
<tr>
<td>Week 4- $1 off</td>
<td>43.56</td>
<td>13.52</td>
</tr>
<tr>
<td>Overall</td>
<td>43.20</td>
<td>15.68</td>
</tr>
</tbody>
</table>

The gender ratio also differed significantly between the four conditions in Experiment I (Table 11). The ratios of male to female were significantly higher in the small discount conditions (i.e., “40cents off” and “10% off”), compared to the moderate discount conditions (i.e., “25% off” and “$1off”) ($\chi^2 = 9.6, p < .01$).

<table>
<thead>
<tr>
<th>Condition</th>
<th>Male</th>
<th>Female</th>
<th>Male/Female ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1- 40c off</td>
<td>13</td>
<td>53</td>
<td>24.5%</td>
</tr>
<tr>
<td>Week 2- 10% off</td>
<td>12</td>
<td>27</td>
<td>44.4%</td>
</tr>
<tr>
<td>Week 3- 25% off</td>
<td>3</td>
<td>42</td>
<td>7.1%</td>
</tr>
<tr>
<td>Week 4- $1 off</td>
<td>5</td>
<td>57</td>
<td>8.8%</td>
</tr>
</tbody>
</table>
Table 12 shows that store visit frequencies were higher among buyers who were exposed to the small discount rate than the moderate discount rate ($F_{Welch} (1, 151) = 9.02, p < .01$).

**TABLE 12**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1- 40c off</td>
<td>6.35</td>
<td>7.31</td>
</tr>
<tr>
<td>Week 2- 10% off</td>
<td>7.00</td>
<td>9.27</td>
</tr>
<tr>
<td>Week 3- 25% off</td>
<td>4.26</td>
<td>4.06</td>
</tr>
<tr>
<td>Week 4- $1 off</td>
<td>3.80</td>
<td>3.70</td>
</tr>
<tr>
<td>Overall</td>
<td>5.26</td>
<td>6.42</td>
</tr>
</tbody>
</table>

These findings suggest that nuisance variable including age, gender, and store visit frequency had some relationships with one of the independent variables (i.e., discount rate). Furthermore, age and gender had some relationship with both of the dependent variables (i.e., perceived value, internal reference price). Age correlated significantly to perceived value ($r = .27, p < .01$) while gender showed some relationship to perceived value ($p = .07$) and IRP ($p = .04$). In contrast, store visit frequency showed no correlation to perceived value ($r = .01, p > .12$) and very weak correlation to IRP ($r = .10, p > .12$).

**Effects of nuisance variables**

Age and gender have shown that they not only had some relationships with the two dependent variables (i.e., perceived value and IRP), but they also separately had significant relationships with one of the independent variables (i.e., discount rate). The complication arises if the effects of the two nuisance variables are still significant when they are analysed jointly with both dependent and independent variables. If this occurs,
the differences in participants’ age and gender across the two levels of the discount rate (small vs. moderate) will have effects on the way they evaluated the discounted muffins. This is known as the violation of homogeneity of regression slopes assumption in the analysis of covariance (ANCOVA).

A test was conducted to examine whether violation to the assumption of homogeneity of regression slopes occurred in this experiment. To do so in the SPSS programme, a general linear model was specified to include the discount rate, age, gender, and their interactions as the independent variables, and perceived value and IRP as the dependent variables (Table 13). This model tested whether the interactions between the discount rate and the two nuisance variables (i.e., age and gender) were significant when they were all included in the same model predicting participants’ perceived value and IRP.

<table>
<thead>
<tr>
<th>Value</th>
<th>Wilks’ Lambda</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.304</td>
<td>227.41</td>
<td>2</td>
<td>199</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>GENDER</td>
<td>.995</td>
<td>.50</td>
<td>2</td>
<td>199</td>
<td>.61</td>
</tr>
<tr>
<td>RATE</td>
<td>.978</td>
<td>2.26</td>
<td>2</td>
<td>199</td>
<td>.11</td>
</tr>
<tr>
<td>AGE</td>
<td>.970</td>
<td>3.09</td>
<td>2</td>
<td>199</td>
<td>.05</td>
</tr>
<tr>
<td>RATE * GENDER</td>
<td>.991</td>
<td>.94</td>
<td>2</td>
<td>199</td>
<td>.39</td>
</tr>
<tr>
<td>RATE * AGE</td>
<td>.984</td>
<td>1.59</td>
<td>2</td>
<td>199</td>
<td>.21</td>
</tr>
<tr>
<td>RATE * AGE * GENDER</td>
<td>.983</td>
<td>.86</td>
<td>4</td>
<td>398</td>
<td>.49</td>
</tr>
</tbody>
</table>

TABLE 13
The Effects of Age, Gender, and Discount Rate on Perceived Value, and Internal Reference Price of the Muffin
Table 13 demonstrates that none of the interactions between the discount rate, gender, and age was significant (all \( p > .20 \)). Although discount rate, gender, and age each had significant correlations with each other, their interactions did not have significant effects on perceived value and IRP. These findings suggest that the assumption of homogeneity of regression slopes was not violated.

For instance, although participants’ age was significantly different between the two discount rate conditions, the interaction effects between the discount rate and age on perceived value and IRP was not significant \((p = .21)\). This means that the difference in participants’ age between the small and moderate discount conditions did not have significant effects on the way they evaluated the discounted muffins in each condition.

Between the two nuisance variables, age \((p = .05)\) had significant effects on perceived value and IRP, whereas gender \((p = .61)\) did not. This suggests that only age had reliable effects on the dependent variables when both age and gender were tested in the same model. The positive correlation between age and perceived value \((r = .27)\) suggests that older participants tended to perceive the discounted muffin more favourable than younger participants. This effect should be taken into account before the relationships between the discount rate and the dependent variables can be interpreted.

In general, the preliminary analysis in this section has showed that the assumption of homogeneity of regression slopes was not violated in Experiment I. It has also been pointed out that age had significant effects on the dependent variables, which should be controlled. As a result, age was included as a covariate in subsequent analyses.
HYPOTHESES TESTING PLAN

Analysis Plan

Experiment I tested five research hypotheses. First, it investigated the effect of the discount rate (small vs. moderate) on buyer responses to the discounted muffins. The moderate discount rate was expected to generate higher perceived value, lower estimates of IRP, and higher reported sales than the small discount rate (H\textsubscript{1}).

Second, it was hypothesised that buyers’ perceived value of the promoted muffins (H\textsubscript{2}) and their estimates of IRP (H\textsubscript{3}) could have effects on the sales of the discounted items.

Finally, Experiment I examined the interaction between the discount rate (small vs. moderate) and discount frame (percentage-off vs. dollar-off). The effects of discount framing on buyers’ perceived value, their estimates of IRP, and their reported purchases were expected to be insignificant at a small discount rate (H\textsubscript{4}) but significant at a moderate discount rate (H\textsubscript{5}). In particular, at a moderate discount rate, the percentage-off discount was expected to generate higher perceived value, higher estimates of IRP and higher reported purchases than the equivalent dollar-off discount.

The statistical techniques used in hypotheses testing were determined by the nature of the three dependent variables. While both the perceived value and the IRP are metric variables, the reported sales variable is a non-metric one. As a result, perceived value and IRP were analysed using the analysis of variance technique, whereas reported purchase was examined using the logistic regression analysis (Table 14).
As dependent variables in the analysis of variance test, perceived value and IRP correlated moderately to each other (r = .31, p < .01). Analysing perceived value and IRP separately could risk inflating a type I error (i.e., rejecting the null hypothesis when it is true) in the findings (Hair et al. 2006). A multivariate technique was used to allow more conservative test of the effects of discount rate and discount frame on the two dependent variables. In addition, as suggested in the preceding section, age was included in these tests as a covariate. In this case, a multivariate analysis of covariance technique (MANCOVA) was appropriate to examine the interaction effect between the discount rate and discount frame on perceived value and IRP.

Second, unlike the analysis that involved perceived value and IRP as dependent variables, there was no significant covariate that was included in the analysis concerning the reported sales. This is because the three nuisance variables (i.e., age, gender, and store frequency) did not have significant relationships with the reported sales (all p > .05). Accordingly, a binary logistic regression was performed with reported sales as the dependent variable, and discount rate, discount frame, IRP and perceived value as the independent variables.

<table>
<thead>
<tr>
<th>Dependent variable</th>
<th>Hypothesis</th>
<th>Test</th>
<th>Independent variable</th>
<th>Covariate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived value</td>
<td>H_1a, H_4a, H_5a</td>
<td></td>
<td></td>
<td>Age</td>
</tr>
<tr>
<td>Internal reference price</td>
<td>H_1b, H_4b, H_5b</td>
<td>MANCOVA</td>
<td>Discount rate, Discount frame</td>
<td></td>
</tr>
<tr>
<td>Reported Sales</td>
<td>H_1c, H_4c, H_5c, H_2, H_3</td>
<td>Logistic regression</td>
<td>Discount rate, Discount frame, Perceived value, Internal reference price</td>
<td>n/a</td>
</tr>
</tbody>
</table>
Test Assumptions

**MANCOVA assumptions**

Several assumptions were tested before MANCOVA could be performed. First, the descriptive and the visual outputs from the SPSS programme (Table 9) showed that the distribution of the two dependent variables resembled normality and that there were no univariate outliers. Second, the two dependent variables, perceived value and IRP, correlated only moderately to each other ($r = .31$). Hence, multicollinearity was not an issue in the current MANCOVA test.

Third, the examination of scatter plots showed that there was no obvious evidence of non-linearity in the relationship between perceived value and IRP, across all four experimental conditions. Therefore, the linearity assumption between the two dependent variables was not violated. Fourth, the greatest Mahalanobis distance recorded in the current sample was 13.79, which is below the critical value of 13.82 (Pallant 2007, p.280). This indicates no multivariate outliers in the sample.

Fifth, the assumption of equal variances was not violated because Levene’s tests did not show significant results (all $p > .12$). Finally, Box’s M test was not significant ($p = .27$). This means that the assumption of homogeneity of variance-covariance matrices was not violated. In summary, the check for MANCOVA test assumptions found no violations. Thus, the MANCOVA test could be used.
Logistic regression assumptions

Unlike MANCOVA, the logistic regression test does not make any assumptions on the normality, linearity and homogeneity of variance of the independent variables, but it tends to require large sample size (Pallant 2007). According to Peduzzi et al. (1996), the number of cases required to run a logistic regression is determined by Equation 1.

**EQUATION 1**

*Number of Observations Required to Run Logistic Regression*

\[ N = 10 \times \left( \frac{k}{p} \right) \]

Let \( p \) be the proportion of positive observations in the population (i.e., purchase proportion) and \( k \) be the number of independent variables, the minimum number of observations required to run logistic regression is ten times the \( k / p \) ratio. In the current study, the proportion of survey respondents who reported purchasing the discounted muffins was \( p = 15.5\% \) (= 33 ÷ 213). The number of independent variables was \( k = 4 \) that include discount frame, discount rate, perceived value, and IRP. Therefore, the sample size appropriate to run logistic regression is 258 (= 10 × 4 ÷ .155).

The actual sample size of 213 is smaller than the recommended size of 258. Using a small sample size would reduce the precision of the statistical estimates. In other words, if the sample is small, it would not detect the results that are important (Rosenthal and Rosnow 2008). Further development on the sample size issue will be discussed subsequently in the actual analysis.
FINDINGS

Effects of Discount Rate on Perceived Value and Internal Reference Price for the Muffin

\( H_{1a} \): Buyers exposed to a moderate discount rate will report significantly higher perceived values of the promoted brand than buyers exposed to a small discount rate

\( H_{1b} \): Buyers exposed to a moderate discount rate will report significantly lower estimates of internal reference price associated with the promoted brand than buyers exposed to a small discount rate

A two-way MANCOVA was used to test the interaction effects between discount rate and discount frame on perceived value and IRP. Table 15 shows that the interaction effect between the discount rate and the discount frame was not significant. Therefore, it was adequate to interpret the main effects. The results from the MANCOVA test showed that the main effect of the discount rate on perceived value and IRP was significant (\( F(2, 202) = 6.92, p < .01 \)).

\[ \text{TABLE 15} \]

Effects of Discount Rate and Discount Frame on Perceived Value and Internal Reference Price of the Muffin

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks’ Lambda</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.17</td>
<td>478.71</td>
<td>2</td>
<td>202</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>AGE</td>
<td>.94</td>
<td>6.33</td>
<td>2</td>
<td>202</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>FRAME</td>
<td>.99</td>
<td>.97</td>
<td>2</td>
<td>202</td>
<td>.38</td>
</tr>
<tr>
<td>RATE</td>
<td>.94</td>
<td>6.92</td>
<td>2</td>
<td>202</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>FRAME * RATE</td>
<td>.99</td>
<td>.71</td>
<td>2</td>
<td>202</td>
<td>.49</td>
</tr>
</tbody>
</table>
The univariate results from MANCOVA indicated that the effect of the discount rate on perceived value was significant ($p < .01$). In particular, the moderate discount ($M = 3.99, SD = .62$) generated significantly higher perceived value than the small discount ($M = 3.66, SD = .70$). The effect size was between moderate and large (Cohen’s $d = .5$) (Rosenthal and Rosnow 2008). These findings supported $H_{1a}$.

On the contrary, the effect of the discount rate on the estimates of IRP was not significant ($p > .12$). The moderate discount ($M = 3.71, SD = .66$) did not change participants’ estimates of IRP more than the small discount ($M = 3.77, SD = .69$). The effect size was small (Cohen’s $d = .08$). These findings did not support $H_{1b}$.

In general, increasing the discount rate from small to moderate improved buyers’ perceptions of the offer value but did not change their estimates of IRP for the promoted muffins.

**Interaction Effects between Discount Rate and Discount Frame on Perceived Value and Internal Reference Price of the Muffin**

Table 15 shows a non-significant interaction effect between the discount frame and the discount rate on perceived value and IRP ($F(2, 202) = .71, p > .12$). Two follow-up one-way MANCOVAs were conducted to test the effects of discount framing on perceived value and IRP at the small ($H_{4a}$, $H_{4b}$) and moderate ($H_{5a}$, $H_{5b}$) discount rate.

$H_{4a}$: When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their perceived value of the promoted brand compared to buyers exposed to an equivalent dollar-off discount
**H4b**: When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their estimates of internal reference price of the promoted brand compared to buyers exposed to an equivalent dollar-off discount.

**TABLE 16**

Effects of Discount Frame on Perceived Value and Internal Reference Price of the Muffin at a Small Discount Rate

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks’ Lambda</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.19</td>
<td>220.48</td>
<td>2</td>
<td>100</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>AGE</td>
<td>.94</td>
<td>3.36</td>
<td>2</td>
<td>100</td>
<td>.04</td>
</tr>
<tr>
<td>FRAME</td>
<td>.99</td>
<td>1.56</td>
<td>2</td>
<td>100</td>
<td>.22</td>
</tr>
</tbody>
</table>

When the discount rate was small, Table 16 shows no significant effect of discount frame (F(2, 100) = 1.56, \( p > .12 \)). In addition, the univariate results suggested a non-significant effect of discount frame on perceived value (\( p > .12 \)). Participants’ perceptions of value were indifferent whether the price promotion was framed either as “10% off” (M = 3.70, SD = .73) or as “40 cents off” (M = 3.62, SD = .68). The effect size was small (Cohen’s d = .11). The results provided supporting evidence for the null effects suggested by H4a.

Univariate results showed that the effect of discount frame on IRP was found to be non-significant (\( p > .05 \)). Participants’ estimates of IRP were no significantly different between the “10% off” discount (M = 3.92, SD = .70) and the “40 cents off” discount (M = 3.68, SD = .68). The effect size was small to moderate (Cohen’s d = .35). The findings lend support for H4b.
**H5a:** When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly more favourable perceived value of the promoted brand than buyers exposed to an equivalent dollar-off discount.

**H5b:** When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly higher estimates of internal reference price of the promoted brand than buyers exposed to an equivalent dollar-off discount.

**TABLE 17**

Effects of Discount Frame on Perceived Value and Internal Reference Price of the Muffin at a Moderate Discount Rate

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks' Lambda</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.15</td>
<td>273.81</td>
<td>2</td>
<td>100</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>AGE</td>
<td>.91</td>
<td>4.93</td>
<td>2</td>
<td>100</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>FRAME</td>
<td>.99</td>
<td>.16</td>
<td>2</td>
<td>100</td>
<td>.85</td>
</tr>
</tbody>
</table>

When the discount rate was moderate, Table 17 shows no significant effect of discount frame (F(2, 100) = .16, p > .10). Univariate results suggested a non-significant effect of the discount frame on perceived value (p > .12). Participants’ perceptions of value were indifferent whether the price promotion was framed as “25% off” (M = 4.06, SD = .63) or as “$1 off” (M = 3.94, SD = .63). The effect size was small (Cohen’s d = .19). The results did not support H5a.

Similarly, the effect of discount frame on IRP was non-significant (p > .12). Participants’ estimates of IRP were indifferent between the “25% off” discount (M = 3.75, SD = .64) and the “$1 off” discount (M = 3.71, SD = .67). The effect size was small (Cohen’s d = .06). The findings did not support H5b.
Effects of Discount Rate, Perceived Value, and Internal Reference Price on Reported Sales of the Muffin

Effects of internal reference price on reported sales of the muffin

H₃: The lower buyers’ estimates of internal reference price are relative to the regular price, the more likely they are to purchase a promoted brand

A binary logistic regression was performed to check whether the discount rate (H₁c), discount frame (H₄c, H₅c), perceived value (H₂), and IRP (H₃) could significantly predict the variances in the reported sales of the muffins. The analysis used discount rate (moderate vs. small), discount frame (percentage-off vs. dollar-off), perceived value, and IRP as independent variables.

### TABLE 18

**Effects of Discount Frame, Discount Rate, Perceived Value and Internal Reference Price on Reported Sales of the Muffins**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME</td>
<td>-0.34</td>
<td>0.48</td>
<td>0.50</td>
<td>1</td>
<td>.482</td>
<td>0.711</td>
</tr>
<tr>
<td>RATE</td>
<td>-1.20</td>
<td>0.71</td>
<td>2.85</td>
<td>1</td>
<td>.092</td>
<td>0.301</td>
</tr>
<tr>
<td>PERCEP</td>
<td>1.06</td>
<td>0.32</td>
<td>10.78</td>
<td>1</td>
<td>.001</td>
<td>2.877</td>
</tr>
<tr>
<td>IRP</td>
<td>-0.25</td>
<td>0.31</td>
<td>0.61</td>
<td>1</td>
<td>.434</td>
<td>0.782</td>
</tr>
<tr>
<td>FRAME * RATE</td>
<td>0.58</td>
<td>0.90</td>
<td>0.41</td>
<td>1</td>
<td>.522</td>
<td>1.777</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.47</td>
<td>1.58</td>
<td>8.00</td>
<td>1</td>
<td>.005</td>
<td>0.011</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)

In addition, it was hypothesised that the interaction between discount rate and discount frame could have a significant effect on reported sales. An interaction was specified between these two constructs in the logistic regression model (Table 18).
The model that included all four predictors and an interaction term showed significant predictability of the variances in the reported sales of the muffins ($\chi^2(5) = 20.34, p < .01$). The predictors explained between 9.1% (Cox and Snell $R^2$) and 15.8% (Nagelkerke $R^2$) of the variance in the reported sales.

Table 18 shows that the interaction effect between discount rate and discount frame was not significant. Due to the lack of significant interaction terms, the main effects of all variables can then be interpreted. Among all the main effects, IRP did not predict a significant variance in the reported sales of muffins ($\beta = -.25, p > .12$). These results did not support H₃.

Furthermore, the previous discussion has suggested that the current sample size of 213 is small to support the current model with four main predictors. Because initial analysis has shown that the effect of IRP on reported sales was non-significant, this predictor was dropped from the logistic regression to improve the power of subsequent analysis to detect important results.

Accordingly, the existing logistic regression then had three independent variables, including the discount rate, the discount frame and the perceived value. Peduzzi et al. (1996) suggest that an adequate sample size for the current logistic regression should be 194 (see Equation 1). In this case, the current sample size of 213 was adequate to detect important results.
**Effects of perceived value on reported sales of the muffin**

**H2**: There is a positive relationship between buyers’ perceived value and whether they purchase the promoted brand

A logistic regression was performed with the three independent variables, which were the discount rate, the discount frame and the perceived value, to predict the variances in the reported sales of muffins. The model also included an interaction term between discount rate and discount frame.

This model predicted significantly the variance in reported sales of muffins ($\chi^2(4) = 19.72, p < .01$). All predictors explained between 8.8 % (Cox and Snell $R^2$) and 15.3% (Nagelkerke $R^2$) of the variance in the reported sales of discounted muffin.

Compared to the initial model that included also IRP as the fourth predictor, the current model did not significantly reduce the variance explained in reported sales. Therefore, eliminating IRP did not significantly affect the model’s ability to predict the reported sales of the muffin.

**TABLE 19**

Effects of Discount Rate, Discount Frame and Perceived Value on Reported Sales of the Muffin

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME</td>
<td>-.33</td>
<td>.48</td>
<td>.46</td>
<td>1</td>
<td>.500</td>
<td>.722</td>
</tr>
<tr>
<td>RATE</td>
<td>1.26</td>
<td>.71</td>
<td>3.18</td>
<td>1</td>
<td>.074</td>
<td>.283</td>
</tr>
<tr>
<td>PERCEP</td>
<td>.99</td>
<td>.31</td>
<td>10.18</td>
<td>1</td>
<td>.001</td>
<td>2.699</td>
</tr>
<tr>
<td>FRAME * RATE</td>
<td>.59</td>
<td>.90</td>
<td>.43</td>
<td>1</td>
<td>.512</td>
<td>1.800</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.12</td>
<td>1.36</td>
<td>14.21</td>
<td>1</td>
<td>.000</td>
<td>.006</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)
Table 19 indicates that perceived value predicted significantly the variance in the reported sales of muffins ($\beta = .99$, $p < .01$). The positive logit coefficient indicated a positive relationship between perceived value and reported sales. Accordingly, as buyers’ perceived value of the promoted muffins increased, reported sales of the muffins also increased. This result supported H$_2$.

**Effects of discount rate on reported sales of the muffin**

$H_{1c}$: *Buyers exposed to a moderate discount rate will report significantly more purchases of the promoted brand than buyers exposed to a small discount rate*

Table 19 shows that the effect of the discount rate on the reported sales was approaching significant ($\beta = 1.26$, $p < .12$). More than 22% (22.4%) of the respondents who viewed the moderate discount reported purchasing the discounted muffins, compared to only 8.5% of the participants did so when the discount rate was small. As a result, increasing the discount rate from 10% to 25% improved the reported sales of the muffin by 11.9% (see Table 7). These findings provided partial support for H$_{1c}$.

**Interaction Effects between Discount Frame and Discount Rate on Reported Purchases of the Muffin**

In order to provide more accurate results, two follow-up logistic regressions were conducted to examine the effects of discount framing on the reported sales of the muffins at a moderate discount rate ($H_{5c}$) and a small discount rate ($H_{4c}$).
**H₄c**: When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their purchases of the promoted brand compared to buyers exposed to an equivalent dollar-off discount.

**H₅c**: When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly higher proportion of purchases of the promoted brand than buyers exposed to an equivalent dollar-off discount.

When the discount rate was small, the follow-up logistic regression indicated that the discount frame and perceived value could not explain the reported sales of the muffins ($\chi^2(2) = 1.52, p > .12$). Altogether, perceived value and discount framing explained between 1.4% (Cox and Snell $R^2$) and 3.2% (Nagelkerke $R^2$) of the variance in the reported sales of discounted muffins.

Table 20 indicates that the effect of discount framing on the reported sales of the muffins at a small discount rate was non-significant ($\beta = .22, p > .12$). Lack of significant effect at low discount rate supported the prediction of **H₄c**.

**TABLE 20**

Effect of Discount Frame and Perceived Value on Reported Sales of the Muffin at a Small Discount Rate

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME</td>
<td>.22</td>
<td>.74</td>
<td>.08</td>
<td>1</td>
<td>.772</td>
<td>.81</td>
</tr>
<tr>
<td>PERCEP</td>
<td>.59</td>
<td>.48</td>
<td>1.48</td>
<td>1</td>
<td>.223</td>
<td>1.80</td>
</tr>
<tr>
<td>Constant</td>
<td>-4.74</td>
<td>2.01</td>
<td>5.55</td>
<td>1</td>
<td>.018</td>
<td>.01</td>
</tr>
</tbody>
</table>

*B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)*
When the discount rate was moderate, the follow-up logistic regression showed that the discount frame and perceived value were able to explain the reported sales of the muffins ($\chi^2(2) = 11.20, p < .01$). In particular, these two variables predicted between 9.9% (Cox and Snell $R^2$) and 15.2% (Nagelkerke $R^2$) of the variances in the reported sales of the discounted muffins.

**TABLE 21**

Effect of Discount Frame and Perceived Value on Reported Sales of the Muffin at a Moderate Discount Rate

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME</td>
<td>.31</td>
<td>.49</td>
<td>.39</td>
<td>1</td>
<td>.532</td>
<td>1.36</td>
</tr>
<tr>
<td>PERCEP</td>
<td>1.28</td>
<td>.42</td>
<td>9.38</td>
<td>1</td>
<td>.002</td>
<td>3.58</td>
</tr>
<tr>
<td>Constant</td>
<td>-6.32</td>
<td>1.81</td>
<td>12.21</td>
<td>1</td>
<td>.000</td>
<td>.002</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)

Table 21 demonstrates that while the effect of perceived value ($\beta = 1.28, p < .01$) on reported sales was significant, the effect of the discount frame on reported sales ($\beta = .31, p > .12$) was not. When the discount rate was moderate, presenting a price promotion either in a percentage-off or a dollar-off frame did not significantly change the sales of the muffins. Therefore, the results did not support $H_{sc}$.

Although the effect of discount framing was not significant, the effect size was noteworthy. When the discount rate was moderate, changing from a dollar-off discount to an equivalent percentage-off discount improved the reported sales of the muffins from 19.4% to 26.7% (see Table 7). Thus, a potential 7.3% improvement in sales may be achieved by changing the presentation format of a moderate discount from a dollar-off frame to a percentage-off frame. This conclusion is not certain until further tests are conducted.
Additional findings – Effects of past visit frequency on consumer response to discount promotions

Previous research has shown that past purchase behaviour could have a significant impact on the way consumer response to discount promotions (Ehrenberg, Uncle, Goodhardt 2004). In particular, irregular customers may evaluate the discount promotions more positively and may be more likely to take up the offers, compared to regular customers (Darke, Chaiken, Freedman 1995; Roy 1994). This perspective would suggest that past visit frequency to the current coffee shop might have impact on the way buyers responded to the price promotions in Experiment I. However, preliminary analysis results (presented in the “Nuisance Variables” section earlier) have showed that past visit frequency to the coffee shop had low and no correlations to buyers’ perceived value of the deal and their IRP respectively.

Despite the initial results, additional analyses were conducted to provide more certainty to the conclusion on the impact of past visit frequency on the findings of Experiment I. The impact of store visit frequency could be controlled for by including this variable as a covariate in the examination of consumer response to price promotions. This can be achieved by conducting the same MANCOVA and Logistic Regression analyses as in previous hypothesis tests and including past visit frequency to the store as one of the covariates. The results are presented in Table 22 and 23.
Table 22

Effects of Discount Rate and Discount Frame on Perceived Value and Internal Reference Price of the Muffins with Age and Store Frequency as Covariates

<table>
<thead>
<tr>
<th>Effect</th>
<th>Wilks' Lambda</th>
<th>F</th>
<th>Hypothesis df</th>
<th>Error df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>.19</td>
<td>430.14</td>
<td>2</td>
<td>201</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>AGE</td>
<td>.94</td>
<td>6.40</td>
<td>2</td>
<td>201</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>STORE FREQ</td>
<td>.99</td>
<td>1.03</td>
<td>2</td>
<td>201</td>
<td>.36</td>
</tr>
<tr>
<td>FRAME</td>
<td>.99</td>
<td>.89</td>
<td>2</td>
<td>201</td>
<td>.41</td>
</tr>
<tr>
<td>RATE</td>
<td>.94</td>
<td>6.78</td>
<td>2</td>
<td>201</td>
<td>&lt;.01</td>
</tr>
<tr>
<td>FRAME * RATE</td>
<td>.99</td>
<td>.71</td>
<td>2</td>
<td>201</td>
<td>.49</td>
</tr>
</tbody>
</table>

Table 23

Effects of Discount Frame, Discount Rate, Perceived Value, and Store Frequency on Reported Sales of the Muffins

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STORE FREQ</td>
<td>-.05</td>
<td>.05</td>
<td>1.18</td>
<td>1</td>
<td>.28</td>
<td>.95</td>
</tr>
<tr>
<td>FRAME</td>
<td>-.34</td>
<td>.48</td>
<td>.49</td>
<td>1</td>
<td>.48</td>
<td>.71</td>
</tr>
<tr>
<td>RATE</td>
<td>-1.22</td>
<td>.71</td>
<td>2.94</td>
<td>1</td>
<td>.09</td>
<td>.30</td>
</tr>
<tr>
<td>PERCEP</td>
<td>1.05</td>
<td>.32</td>
<td>10.80</td>
<td>1</td>
<td>&lt;.01</td>
<td>2.86</td>
</tr>
<tr>
<td>FRAME * RATE</td>
<td>.65</td>
<td>.90</td>
<td>.52</td>
<td>1</td>
<td>.47</td>
<td>1.92</td>
</tr>
<tr>
<td>Constant</td>
<td>-5.15</td>
<td>1.37</td>
<td>14.07</td>
<td>1</td>
<td>&lt;.01</td>
<td>&lt;.01</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)

The results from Table 22 and 23 show no significant deviations from the findings in Table 15 and 19 where past visit frequency was not included as a covariate. This confirms that past visit frequency to the coffee shop had no significant impact on the way buyers in Experiment I responded to the muffin promotions.
SUMMARY

Hypotheses Testing Results

Experiment I showed supporting evidence for the significant effects of the discount rate on buyer responses to the discounted muffins. When the discount rate increased from small to moderate, perceived value and the reported purchases of the muffins increased. However, the two discount rates did not lead to significant differences in buyers’ estimate of IRP. These results supported $H_{1a}$ and partially supported $H_{1c}$, but did not support $H_{1b}$.

In addition, between the two evaluative criteria, buyers’ perceived value of the promoted muffins had significant effects on their reported purchases of the muffins, while their estimates of IRP did not. These findings supported $H_2$ but not $H_3$.

The focus of Experiment I was to investigate the interaction effect between the discount rate and the discount frame on buyer responses to sales promotions. The overall findings showed a non-significant effect for that interaction. When the discount rate was small, buyers exposed to the percentage-off discount (“10% off”) showed no significant differences in their perceived value, estimates of IRP and their reported purchases of the muffins, compared to those exposed to the dollar-off discount (“40 cents off”). These findings supported $H_{4a}$, $H_{4b}$, and $H_{4c}$.

On the other hand, when the discount rate was moderate, buyers responses to the promoted muffins were not significantly different between the percentage-off discount (“25% off”) and the dollar-off discount (“$1 off”). These results did not support $H_{5a}$, $H_{5b}$, and $H_{5c}$. Table 22 summarises the results of the hypotheses tested in Experiment I.
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H_{1a}</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>Buyers exposed to a moderate discount rate will report significantly higher perceived values of the promoted brand than buyers exposed to a small discount rate</strong></td>
<td></td>
</tr>
<tr>
<td>H_{1b}</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>Buyers exposed to a moderate discount rate will report significantly lower estimates of internal reference price associated with the promoted brand than buyers exposed to a small discount rate</strong></td>
<td></td>
</tr>
<tr>
<td>H_{1c}</td>
<td>Partially Supported</td>
</tr>
<tr>
<td><strong>Buyers exposed to a moderate discount rate will report significantly more purchases of the promoted brand than buyers exposed to a small discount rate</strong></td>
<td></td>
</tr>
<tr>
<td>H_{2}</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>There is a positive relationship between buyers’ perceived value and whether they purchase the promoted brand</strong></td>
<td></td>
</tr>
<tr>
<td>H_{3}</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>The lower buyers’ estimates of internal reference price are relative to the regular price, the more likely they are to purchase a promoted brand.</strong></td>
<td></td>
</tr>
<tr>
<td>H_{4a}</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their perceived value of the promoted brand compared to buyers exposed to an equivalent dollar-off discount</strong></td>
<td></td>
</tr>
<tr>
<td>H_{4b}</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their estimates of internal reference price of the promoted brand compared to buyers exposed to an equivalent dollar-off discount</strong></td>
<td></td>
</tr>
<tr>
<td>H_{4c}</td>
<td>Supported</td>
</tr>
<tr>
<td><strong>When the discount rate is small, buyers exposed to a percentage-off discount will report no significant differences in their purchases of the promoted brand compared to buyers exposed to an equivalent dollar-off discount</strong></td>
<td></td>
</tr>
<tr>
<td>H_{5a}</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly more favourable perceived value of the promoted brand than buyers exposed to an equivalent dollar-off discount</strong></td>
<td></td>
</tr>
<tr>
<td>H_{5b}</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly higher estimates of internal reference price of the promoted brand than buyers exposed to an equivalent dollar-off discount</strong></td>
<td></td>
</tr>
<tr>
<td>H_{5c}</td>
<td>Not Supported</td>
</tr>
<tr>
<td><strong>When the discount rate is moderate, buyers exposed to a percentage-off discount will report significantly higher proportion of purchases of the promoted brand than buyers exposed to an equivalent dollar-off discount</strong></td>
<td></td>
</tr>
</tbody>
</table>
Implications for Experiment II

Experiment I did not find significant effects of the discount framing on buyer responses to the moderate discount rate (H_5). These findings seem to contradict the outcomes of previous studies (e.g., DelVecchio, Krishnan and Smith 2007; Gendall et al. 2006).

Failure to find a significant effect of the discount framing at the moderate discount rate in Experiment I may reflect challenges in conducting field experiments. Unlike laboratory-based studies where all prominent considerations to a purchase decision are controlled for, the effects of percentage versus dollar framing in field experiments are more difficult to detect (Chen, Monroe, and Lou 1998; DelVecchio, Lakshmanan, and Krishnan 2009). This is because multiple factors are involved in making decision in real-world consumption settings. Hence, the effects of the discount framing could become quite modest and thus are more difficult to uncover (Berkowitz and Walton 1980; Dodds, Monroe, and Grewal 1991).

Accordingly, it is suggested that results of Experiment I do not contradict the existing literature. Instead, it complements the existing literature by providing evidence on the effects of discount framing in an actual retail environment. While the current viewpoint supports the existence of the effects of percentage versus dollar framing on consumers’ decision making, it showcases quite a modest effect of such discount framing tactic in real-world settings.

An alternative perspective can also explain the indifferences between percentage-off and dollar-off formats found in H_5. As Chandrashekaran (2004) suggests, buyers should rate discount formats equally as long as these discounts come with logically equivalent information. According to this viewpoint, buyers should not judge a dollar-off discount
different from a percentage-off discount if these two formats are logically analogous. Essentially, this alternative perspective advocates that buyers are rational and discount framing effects should not impact their purchase decisions.

To address this alternative explanation, the next field experiment, Experiment II, will provide a more rigorous testing for the effects of discount framing at moderate discount rate. More specifically, Experiment II will examine whether buyers would respond differently when exposed to a percentage-off discount, a dollar-off discount, and a simple (yet equivalent) discount format (e.g., regular $4, today $3.60). The simple discount format does not contain a saving frame but uses a discount price information (today $3.60) to imply the saving incentive.

If consumers are rational and that the Chandrashekaran’s suggestion (2004) is correct, there should be no differences in the way consumers respond to the three discount formats at a moderate discount rate. On the other hand, if the current perspective adopted in this thesis is true, there should be significant differences in buyer responses between percentage-off discount and the simple discount, and between dollar-off and the simple discount. However, the differences in buyer response to a dollar-off and a percentage-off format would be modest as found in the current experiment.

Experiment II will extend the examination of the effects of percentage versus dollar framing in a similar type of venue. In particular, the second experiment was conducted at a fast-food restaurant that is located inside the food court of a different shopping centre. In addition, the test product in Experiment II was also a low-cost, frequently purchased food item. The setting of Experiment II helps extend and reinforces the findings of Experiment I in regards to the effects of discount framing in live retail environments.
Finally, it should be acknowledged that Experiment I measured the sales impact of discount framing by using the reported purchase data from buyers who participated in the survey. Although the reported purchases measure was hoped to provide a reasonable representation of the actual sales of the promoted muffins, this type of purchase data did not capture all the sales volume of the discounted muffins. Instead, it only recorded those purchases made by survey participants. Experiment II will rectify this issue by incorporating store sales data, which allows more accurate measure of the effects of discount framing on consumers’ purchases.
CHAPTER SIX

EXPERIMENT II

This chapter describes the second field experiment conducted at a franchised fast-food restaurant. The restaurant layout is shown in Figure 7. This experiment extends Experiment I to investigate whether a percentage-off discount and a dollar-off discount could generate different responses from consumers when the discount rate is moderate.

FIGURE 7

The Layout of the Restaurant

This chapter begins with a discussion on the preparation process for Experiment II. After that, the experimental procedure is described with the illustrations of various promotion stimuli used in this field experiment. A new hypothesis, H₆, is then introduced. Finally, the summary section highlights the findings discovered from the second field experiment.
PURPOSES OF EXPERIMENT II

Experiment II improves Experiment I in three significant aspects. First, it used store sales data to capture the behavioural effects of the discount framing. While Experiment I captured the behavioural effect of the discount framing using the reported purchase data from survey buyers, Experiment II used store sales data to record actual purchase behaviour.

Second, Experiment I has shown that the effects of percentage versus dollar framing were not significant at moderate discount rate. This could mean that either the discount framing effect in general do not exist because consumer are rational and able to analyse thoroughly discount information (Chandrashekaran 2004). Alternatively, this could mean that discount framing effects do exist in real-world settings but their effect sizes can be modest.

Experiment II aimed to verify the effectiveness of percentage-off versus dollar-off framing by incorporating an additional discount condition. The additional discount was presented in a simple format (regular $7.95, today $5.95) that does not include saving value but implies saving incentive through the discount price information. This new format is logically equivalent to both the percentage-off (regular $7.95, 25% off, today $5.95) and the dollar-off (regular $7.95, $2 off, today $5.95) discounts.

If discount framing has effects on buyer behaviour, Experiment II should find that buyers exposed to the simple discount respond differently to those exposed to the percentage-off and dollar-off discounts. On the other hand, if discount framing does not have effects on buyer behaviour as suggested by Chandrashekaran (2004), the three discount formats in Experiment II should not generate different responses from buyers.
It follows from Experiment I that the differences in buyer responses to a percentage-off frame and a dollar-off frame were not significant in the retail environment. However, previous research has indicated that buyers exposed either of these two discount formats should have more favourable responses to the discounted item than those exposed to the simple discount format (Chandrashekar 2004; Della Bitta, Monroe, and McGinnis 1981; DelVecchio, Lakshmanan, and Krishnan 2009; Yin and Dubinsky 2004).

As a result, Experiment II was expected to find significant differences in buyer responses between a simple discount and a dollar-off discount, and between a simple discount and a percentage-off discount. Nevertheless, the difference between the percentage-off and the dollar-off format was expected to be non-significant.

Finally, Experiment II also included a control condition in that the same item (i.e., chicken burrito) was promoted using only in-store displays and banners but did not entail saving incentives. By comparing the control condition with the three discount conditions, it could be ascertained whether price promotions actually increased the sales of the chicken burritos beyond what was contributed by in-store displays (Narasimhan, Neslin, and Sen 1996).

In this case, the control no-discount promotion was expected to have a lower perceived value and a higher estimate of IRP than the percentage-off, dollar-off, and simple discounts. In addition, sales of the chicken burritos were expected to be much lower when there was no price saving compared to when there were saving incentives.
HYPOTHESES

A new set of hypotheses was devised for Experiment II based on the findings from Experiment I and the existing literature on the effects of discount framing (Chandrashekaran 2004; Della Bitta, Monroe, and McGinnis 1981; DelVecchio, Lakshmanan, and Krishnan 2009; Yin and Dubinsky 2004).

$H_6$: When the discount rate is moderate, there are expected to be significant differences in buyer responses to various discount frames of the same promoted brand. More specifically,

$H_{6a}$: There will be no significant differences in perceived value of the promoted brand between buyers exposed to a percentage-off discount and those exposed to a dollar-off discount. However, the perceived value of buyers exposed to either a percentage-off or a dollar-off discount will be significantly higher than those exposed to a simple discount.

$H_{6b}$: There will be no significant differences in estimates of internal reference price of the promoted brand between buyers exposed to a percentage-off discount and those exposed to a dollar-off discount. However, the estimates of internal reference price of buyers exposed to either a percentage-off or a dollar-off discount will be significantly higher than those exposed to a simple discount.

$H_{6c}$: There will be no significant differences in sales of the promoted brand between a percentage-off discount and a dollar-off discount. However, sales of either a percentage-off or a dollar-off discount will be significantly higher than that of a simple discount.
RESEARCH METHODOLOGY

Experimental Design

Experiment II used a between-subject design to examine the effects of discount framing on buyers’ perceived value of the promoted item, their estimate of internal reference price (IRP), and their actual purchases. The research design comprised three experimental groups and one control group. The three discount frame treatments were a percentage-off format (regular $7.95, $2 off, today $5.95), a dollar-off format (regular $7.95, 25% off, today $5.95), and a simple discount format (regular $7.95, today $5.95). In the control condition, the same product (i.e., chicken burrito) was promoted using the same in-store displays and banners but did not feature a discount.

<table>
<thead>
<tr>
<th>Order</th>
<th>Condition</th>
<th>Promotion</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Experimental</td>
<td>Regular $7.95, $2 off, today $5.95</td>
<td>Sales; Survey</td>
</tr>
<tr>
<td>Week 2</td>
<td>Experimental</td>
<td>Regular $7.95, 25% off, today $5.95</td>
<td>Sales; Survey</td>
</tr>
<tr>
<td>Week 3</td>
<td>Experimental</td>
<td>Regular $7.95, today $5.95</td>
<td>Sales; Survey</td>
</tr>
<tr>
<td>Week 4</td>
<td>Control</td>
<td>No discount</td>
<td>Sales; Survey</td>
</tr>
</tbody>
</table>

Table 25 demonstrates the order of testing in Experiment II. Note that the current experiment combined both survey data and store sales data to better capture consumer responses to price promotions. The survey data measured buyers’ perceived value and their estimates of IRP, whereas the store data recorded the actual sales of the chicken burritos during the entire days that the promotions were available.
**Instrument Design**

A chicken burrito, a grilled chicken and salsa salad wrapped in a flour sheet, was the treatment product for this experiment. The chicken burrito is one of the many burrito varieties available at the restaurant. The regular price for this item is $7.95, which was discounted by 25% during the study period. The promotion has been used since May 2012 as the store’s strategy to boost sales on Mondays. In the original promotion, the price discount was framed in a simple discount format (regular $7.95, today $5.95).

**Wall menu**

The wall menu contains the regular price of the promoted product, $7.95 for a chicken burrito. Consumers generally notice information on the wall menu together with the displays and banners when making their purchase decision. They were assumed to make use of this external reference price in their purchase decision.

**FIGURE 8**

Wall Menu at the Restaurant
Displays

The displays were prepared by a professional graphic designer, closely following the current marketing materials used by the restaurant chain. A poster of the chicken burrito was taken from the franchise’s website. The poster was digitally enhanced in three aspects, adding the discount price, the discount frame, and the terms and conditions. No pricing elements were included in the poster in the control condition. All displays were presented in A3-sized paper (420mm x 297mm). The four versions of the display can be found in Appendix D.

FIGURE 9

Example of Display in Experiment II
**Banners**

Together with displays, banners were used to increase exposure of the discount promotions. The banners contained similar design elements as the displays and were customised for all four conditions.

**Survey**

Surveys in this experiment were adopted from the ones used in Experiment I. Four versions of the survey were created, one for each experimental condition. The structure of these surveys was substantially similar to each other. The survey measured buyers’ perceived value and their estimates of IRP. The perceived value construct was gauged with a five-point Likert scale, anchored by 1 as strongly disagree and 5 as strongly agree.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Chicken Fajita Burrito promotion is a great deal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what I expect it to be</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>At this price, I would save a lot of money</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what other retailers charge for similar product</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The promotion appears to be a bargain</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>
The IRP construct was measured with an open-ended format in that buyers indicated their estimates for three price items.

| The most you are willing to pay for a similar meal | $______________ |
| The price you consider acceptable for a similar meal | $______________ |
| The least you expect to pay for a similar meal | $______________ |

The survey collected data on age and gender to capture buyers’ demographic background. In addition, it included two items to gauge buyers’ frequency of visiting the current restaurant and fast-food restaurants in general.

| Gender | □□ Male | □□ Female |
| Age: ____________ years |
| Frequency of visiting Salsa’s Booragoon: ________ times/past 4 weeks |
| Frequency of visiting fastfood restaurants (incl.Salsa’s): ________ times/past 4 weeks |

Finally, buyers were instructed to provide their contact details at the back of the survey form to enter into a random draw to win one of five $50 store vouchers. The random draw was to encourage participation in the survey. For all survey versions used in this experiment, refer to Appendix D.
Sampling

Sampling frame

The sampling frame includes all buyers who made purchases at the restaurant. The study used a systematic sampling method in that the interviewer approached every second buyer that had paid for his/her purchase at the cashier. On average, around one in two customers who had been approached to complete the survey agreed to participate. This makes the response rate of 50%. This method is appropriate in this current study because it helps control for interviewer’s bias. This bias can occur when the interviewer chooses to approach only buyers who seem open to the survey activity (Rosenthal and Rosnow 1991).

Sampling procedure

During the survey period, the researcher monitored the buyers who had just paid for their purchases at the cashier and approached every second buyer. These buyers were systematically approached by the researcher and asked if they would like to participate in the survey. Participation in the survey was voluntary. Buyers who had completed the surveys were not asked to re-do the survey. This was to avoid respondent duplication in the survey data.

Sample size

To increase participation, surveys were administered during the busiest trading hours, from 11.30am to 2.30pm on Mondays. Previous research with a similar focus to this study has used samples of about 30 respondents (e.g., Della Bitta, Monroe, and McGinnis 1981; Hardesty and Bearden 2003).
Potential Biases

To minimise potential biases, all surveys were administered during the same day of the week at the same time, from 11.30am to 2.30pm on Mondays. The consistency of the timeframe increased the probability that the sample of participants was similar across conditions over time.

The data collection was conducted during the period that did not include school and public holidays. This was to avoid including many different segments of buyers. This type of discount targeted shopping centre customers who are regular visitors. Conducting surveys during school and public holidays may distort findings in the study that aims to understand the general behaviour of these regular visitors.
RESEARCH PROCEDURE

Overview

Data collection was conducted at a franchised fast-food restaurant. The store is situated within one of the busiest shopping centres in Western Australia. The shopping centre lies 9km south of Perth’s central business district and attracts around 13 million visitors annually (AMP Capital 2012). The restaurant specialises in Mexican-type, convenient and healthy food. The store opens seven days a week from 9am until 5pm with extended trading until 9pm on Thursdays. The store is located within the food court area within the premises of the shopping centre. The store’s annual revenue has been in the $700,000 to $1,000,000 range since it opened in 2011.

The study was implemented as in-store promotional campaigns between August and September in 2012. During the first three weeks of the study period, price promotions for the chicken burrito were available to buyers who visited the store on Mondays. The price promotions were advertised via in-store displays and banners. In the final week of the study period (i.e., the control condition), no price discounts were offered, but similar displays and a banner were set up to promote the chicken burrito.

Store sales data was collected during all four Mondays, which allowed the measure of the discount framing effects on purchase behaviour. In addition, survey data was only collected between 11.30am and 2.30pm on those Mondays. The survey data provided perceptive measures of buyer responses, while the store sales data added a behavioural measure. By using both data sources, the experiment was able to capture more accurately the effects of the price promotions.
Displays, Banners and Wall Menu

In this study, the treatment stimuli were presented using in-store displays and banners. The displays were A3-sized (420mm x 297mm) featuring the photo of the chicken burrito in the chosen promotion formats. In each condition, two identical displays were used. One display was placed on the countertop around the waiting zone which can be seen as customers approach the store. The other display was placed next to the cashier where buyers make payments. The chosen display locations ensure that most buyers would notice the promotions before placing their orders.

To further enhance exposure of the promotion, a banner was used. The banner incorporated designs elements that corresponded to the displays in the same experimental condition. The banner was hung underneath the wall menu. This is a prime in-store position, which further increased the chance that buyers would notice the promotion when considering meal options. An example photo below shows how displays and banner were arranged in the experiment. Note that while the saving information ($2 or 25%) and the discount price ($5.95) were featured on both displays and banners, the advertised regular price can only be seen on the wall menu. All these three types of display were located in adjacent to one another, allowing easy gathering of price information (Figure 10).
Customer Survey and Sales Data Collection

The survey procedure was similar to that employed in Experiment I. Buyers who visited the store during the period between 11.30am and 2.30pm on Mondays were asked to participate in the survey. After completing the questionnaire, buyers placed their forms in the competition box to enter the draw to win store vouchers. Furthermore, store sales data were obtained in all four testing conditions.
PRELIMINARY DATA ANALYSIS

Data Processing

*Store sales data*

The store sales data was extracted from the store’s computer system and transferred into Microsoft Excel for cleaning. The data was available as daily sales indices. The two indicators chosen for the present analysis were (1) the number of chicken burritos sold on Monday (i.e., the discounted product) and (2) the number of all other food items sold on Monday, except chicken burritos. Table 24 shows that store sales were rather similar across the study period, ranging from 203 to 205 food items in all conditions.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Number of chicken burrito sold on Monday</th>
<th>Number of all other food items sold on Monday</th>
<th>Total</th>
<th>Percentage of Chicken Burrito</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2 off</td>
<td>65</td>
<td>139</td>
<td>204</td>
<td>31.8%</td>
</tr>
<tr>
<td>25% off</td>
<td>71</td>
<td>134</td>
<td>205</td>
<td>34.6%</td>
</tr>
<tr>
<td>$5.95</td>
<td>40</td>
<td>164</td>
<td>204</td>
<td>19.5%</td>
</tr>
<tr>
<td>No discount</td>
<td>24</td>
<td>179</td>
<td>203</td>
<td>11.8%</td>
</tr>
</tbody>
</table>

*Survey data*

The survey data was entered into Microsoft Excel for preliminary processing and then was transferred to the SPSS programme for in-depth analyses and hypotheses testing. Survey forms with excessive missing data were discarded from the analysis. In the end, 161 survey forms were retained for subsequent analyses.
Little’s MCAR tests were performed to check the impact of missing values in the current data. The findings showed that missing values appeared to be at random (all \( p > .12 \)). Therefore, missing values for all continuous variables in the data were replaced.

**Descriptive Statistics**

**Participant information**

Table 27 shows that the number of store patrons who participated in the survey ranged from 38 in the simple discount condition, 48 in the “25% off” condition, 52 in the “$2 off” condition, and 23 in the control (no discount) condition.

The mean age of buyers in the survey was 30 years (\( M = 30.1, \ SD = 11 \)). Buyers’ age was not significantly different across all four conditions (\( F_{\text{Welch}}(3, 73) = 1.72, p > .12 \)).

Female buyers accounted for 62.3% (\( n = 86 \)) while male buyers accounted for 37.7% (\( n = 52 \)) of the total sample. The gender ratio did not differ across all four conditions (\( \chi^2(2) = 2.43, p > .10 \)).

**TABLE 27**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Male</th>
<th>Female</th>
<th>N</th>
<th>Mean Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% off</td>
<td>22</td>
<td>26</td>
<td>48</td>
<td>32.2</td>
</tr>
<tr>
<td>$2 off</td>
<td>16</td>
<td>36</td>
<td>52</td>
<td>30.7</td>
</tr>
<tr>
<td>$5.95</td>
<td>14</td>
<td>24</td>
<td>38</td>
<td>27.4</td>
</tr>
<tr>
<td>No discount</td>
<td>10</td>
<td>13</td>
<td>23</td>
<td>28.6</td>
</tr>
<tr>
<td>Total</td>
<td>62</td>
<td>99</td>
<td>161</td>
<td>30.1</td>
</tr>
</tbody>
</table>
In the four-week period before the survey, buyers reported visiting the current restaurant over three times (M = 3.5, SD = 4.9) and visiting fast-food restaurants in general over seven times (M = 7.0, SD = 6.9) on average. There were no significant differences in store and general visit frequencies across all four conditions (all \( p > .12 \)).

**Scale validation**

Measures of the perceived value and the IRP constructs both showed good levels of reliability at the aggregate study level and the individual condition level. All coefficient alpha estimates exceeded the common threshold of .70 (Nunnally 1978).

Furthermore, the perceived value construct (.59 < all \( r < .75 \)) and the IRP construct (.57 < all \( r < .77 \)) both demonstrated moderate to high item-to-total correlations. This allowed forming composite scores for these constructs using averaging method. These scores represented the perceived value construct and the IRP construct in subsequent analyses.

**TABLE 28**

**Reliability of Perceived value and Internal Reference Price Measures in Experiment II**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Cronbach’s alpha</th>
<th>Perceived value</th>
<th>Internal reference price</th>
</tr>
</thead>
<tbody>
<tr>
<td>25% off</td>
<td>.87</td>
<td></td>
<td>.80</td>
</tr>
<tr>
<td>$2 off</td>
<td>.78</td>
<td></td>
<td>.81</td>
</tr>
<tr>
<td>$5.95</td>
<td>.88</td>
<td></td>
<td>.81</td>
</tr>
<tr>
<td>No discount</td>
<td>.91</td>
<td></td>
<td>.87</td>
</tr>
<tr>
<td>Overall</td>
<td>.87</td>
<td></td>
<td>.81</td>
</tr>
</tbody>
</table>
Distribution of dependent variables

Descriptive and visual outputs generated from the SPSS programme were used to examine whether the two dependent measures were normally distributed (Table 29). The distribution of the perceived value variable resembled normality. Most buyers deemed the discount promotion favourable because the average rating ($M = 3.80$) was greater than the mid-point of the five-point scale.

The distribution of IRP also resembled normality. Buyers’ estimate of IRP was lower than the regular retail price ($7.38 < 7.95$). There was no substantial difference between the 5% trimmed mean ($M = 7.32$) and the normal mean ($M = 7.38$). Hence, outliers were not an issue for the IRP variable.

<table>
<thead>
<tr>
<th>TABLE 29</th>
</tr>
</thead>
<tbody>
<tr>
<td>Descriptive Statistics for Dependent Measures in Experiment II</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>Statistic</td>
</tr>
<tr>
<td>Perceived value</td>
</tr>
<tr>
<td>Internal reference price</td>
</tr>
</tbody>
</table>

S.E = standard error, S.D = standard deviation
HYPOTHESES TESTING PLAN

Analysis Plan

Experiment II examined the final hypothesis (H₆). It was expected that buyers exposed to the percentage-off discount (regular $7.95, 25% off, today $5.95) would show no differences in their responses to the promoted brand than buyers exposed to the dollar-off discount (regular $7.95, $2 off, today $5.95). However, buyers exposed to either of these two discounts would have significantly more favourable perceived value and higher estimates of IRP than the simple promotion (regular $7.95, today $5.95) and the no-discount promotion respectively. Lastly, the actual sales of chicken burritos were expected to be highest between percentage-off and dollar-off discount, followed by the simple discount, and lastly by the control no-discount promotion.

The choice of statistical tests in Experiment II was determined by the nature of the three dependent variables. First, to examine the effect of discount frame on perceived value and IRP, analysis of variance technique was chosen. This was appropriate due to the nature of metric measurements of the two dependent variables. In addition, it was found that perceived value and estimate of IRP were weakly correlated (r = .19). The same technique as in Experiment I (i.e., MANOVA or MANCOVA) will be appropriate if the correlation between the two dependent variables is moderate (Pallant 2007). As the correlation between perceived value is IRP was low in this case (i.e., <.3), the risk of inflating type I error when these two variables are analysed separately is negligible. Accordingly, Pallant (2007) suggests that separate analyses of variance (ANOVAs) could be performed to examine the effects of discount frame on perceived value and IRP.
In addition, a significant main effect of discount frame in an ANOVA test does not necessarily indicate a significant difference between individual pairs of discount frames. Hence, follow-up pairwise comparisons were conducted to examine the difference between all four promotions.

Second, to analyse the effect of discount framing on the actual sales of the chicken burritos, a binary logistic regression was conducted to compare the actual sales among all four conditions. Table 30 summarises the statistical techniques that were used in hypotheses testing.

<table>
<thead>
<tr>
<th>Data</th>
<th>Dependent variable</th>
<th>Hypothesis</th>
<th>Test</th>
<th>Independent variable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey</td>
<td>Perceived value</td>
<td>$H_{oa}$</td>
<td>ANOVA</td>
<td>Discount frame</td>
</tr>
<tr>
<td></td>
<td>Internal reference price</td>
<td>$H_{ob}$</td>
<td>ANOVA</td>
<td></td>
</tr>
<tr>
<td>Store sales</td>
<td>Actual Sales</td>
<td>$H_{oc}$</td>
<td>Logistic Regression</td>
<td>Discount frame</td>
</tr>
</tbody>
</table>

Test Assumptions

*Assumptions of ANOVA test*

Checks were conducted to make sure that the assumptions for ANOVA were met before this kind of technique could be used. First, the descriptive and visual outputs from the SPSS programme showed no unusual distributions of the perceived value and the IRP variables. Hence, the univariate normality for both variables was assumed. The SPSS outputs also indicated that univariate outliers were not an issue in the current experiment.
Second, tests were conducted to check whether the assumption of equality of variance for the two dependent variables was met. Levene’s test results indicated that both the perceived value measure ($p > .70$) and the IRP measure ($p > .40$) showed non-significant values. This means that the assumption on equality of variance was not violated. Overall, preliminary tests showed no violations of the basic assumptions and ANOVA tests could be appropriately performed for both perceived value and IRP.

**Assumptions of Logistic Regression test**

Logistic regression does not make any assumptions on the normality, linearity, and homogeneity of variance for the independent variables, but it tends to require a large sample size (Pallant 2007). According to Peduzzi et al. (1996), the minimum number of observations required to run a logistic regression is determined by ten times the $k / p$ ratio, with $p$ as the proportion of positive observations in the population and $k$ as the number of independent variables in the analysis (Equation 1). In the current study, the proportion of customers who bought the chicken burritos was $p = 24.5\%$ ($= 200 \div 816$). The number of independent variables was $k = 1$, which was the discount frame. Accordingly, the minimum sample size required to run logistic regression is $41$ ($=10 \times 1 \div .245$). Therefore, the actual sample size of 816 was adequate to perform a logistic regression in Experiment II.
FINDINGS

Discount Framing Effect on Perceived Value of the Chicken Burrito

\( H_{6a} \): When the discount rate is moderate, there will be no significant differences in perceived value of the promoted brand between buyers exposed to a percentage-off discount and those exposed to a dollar-off discount. However, the perceived value of buyers exposed to either a percentage-off or a dollar-off discount will be significantly higher than those exposed to a simple discount.

An ANOVA test was conducted using inputs from the survey data. It examined whether buyers’ perceived value were significantly different between the percentage-off discount (regular $7.95, 25\%$ off, today $5.95$), the dollar-off discount (regular $7.95, $2$ off, today $5.95$), the simple discount (regular $7.95, today$ $5.95$), and the no-discount promotion.

The effect of discount frame on perceived value was significant (\(F(3, 157) = 6.46, p < .01\)). The observed power of discount frame was .97, which indicates a high degree of confidence that there was a significant difference in perceived value between all discount framing conditions. In other words, the chance of making type II errors (i.e., failing to reject the null hypothesis when it is false) here is only about 3%.

Following this result, pairwise comparisons were performed to examine whether significant differences existed among individual pairs of discount frames. To reduce type I errors (i.e., rejecting the null hypothesis when it is true) in the findings, the critical value was corrected using Bonferroni procedure. The new critical value was estimated by dividing an existing \( \alpha \) level (i.e., .05) by the number of pairwise comparisons (i.e., 6). The new critical value was \( \alpha' = .008 (=.05/6) \).
Figure 11 shows that the percentage-off discount (M = 4.03, SD = .61) elicited higher perceived value ratings than the dollar-off discount (M = 3.88, SD = .59). In congruence to expectation, the difference in buyers’ perceived value between these two formats was not statistically significant (t(98) = 1.25, \( p = .21 \), Cohen’s d = .25).

Furthermore, the simple discount (M = 3.68, SD = .70) generated less favourable perceived value than the percentage-off discount (M = 4.03, SD = .61) (t(84) = 2.41, \( p = .02 \), Cohen’s d = .53). The difference was marginal (.0083 < \( p < .05 \)). On the other hand, the difference between the dollar-off discount (M = 3.88, SD = .59) and the simple discount in perceived value was not significant (t(88) = 1.47, \( p = .15 \)).

In general, although the differences between the three discount formats turned out as expected, pairwise comparisons did not show significant results. Thus, \( H_{6a} \) was not supported.
Finally, compared to the control no-discount promotion (M = 3.34, SD = .76), both the percentage-off discount and the dollar-off discount generated significantly more favourable perceived value (both $p < .0083$). On the contrary, the difference in perceived value between the no-discount promotion and the simple discount was not significant ($t(59) = 1.78, p = .08$, Cohen’s $d = .47$).

**Discount Framing Effect on Internal Reference Price of the Chicken Burrito**

*H₀*: *When the discount rate is moderate, there will be no significant differences in estimates of internal reference price of the promoted brand between buyers exposed to a percentage-off discount and those exposed to a dollar-off discount. However, the estimates of internal reference price of buyers exposed to either a percentage-off or a dollar-off discount will be significantly higher than those exposed to a simple discount.*

An ANOVA test was conducted using the survey data to examine whether buyers’ estimates of IRP were significantly different among the four test promotions.

**FIGURE 12**

Effects of Discount Frame on Internal Reference Price of the Chicken Burrito

![Graph showing effects of discount frame on internal reference price](image)
The result showed that the effect of discount frame on IRP was not significant \((F(3, 157) = 2.03, p = .11)\). The observed power of discount frame was .52, which indicates a low confidence in suggesting that there was a significant difference between estimates of IRP among all discount framing conditions. In other words, the possibility making type II errors here is about 48%.

In order to test \(H_{6b}\), several pairwise comparisons were performed with a Bonferroni-corrected critical value \((\alpha' = .0083)\). Figure 12 shows that buyers who saw the percentage-off discount \((M = 7.39, SD = 1.33)\) had no different estimates of IRP than those who encountered the dollar-off discount \((M = 7.17, SD = 1.54)\) \((t(98) = .76, p = .45, \text{Cohen's } d = .15)\).

Figure 12 indicates that the simple discount \((M = 7.23, SD = 1.67)\) generated no significant difference in estimates of IRP than the percentage-off discount \((M = 7.39, SD = 1.33)\) \((p > .12)\). Similarly, the differences between the dollar-off discount \((M = 7.17, SD = 1.54)\) and the simple discount was not significant \((p > .12)\).

In general, there were no significant differences in the estimates of IRP among all three discount conditions. The available findings demonstrated that having in-store promotion did not lower customers’ estimates of IRP. Therefore, \(H_{6b}\) was not supported.

Finally, compared to the control no-discount promotion \((M = 8.10, SD = 1.69)\), only the dollar-off discount \((M = 7.17, SD = 1.54)\) had slightly lower estimates of IRP \((p = .02, \text{Cohen’s } d = .58)\). This difference was only marginal \(.0083 < p < .05)\).
Discount Framing Effect on Sales of the Chicken Burrito

$H_{6c}$: When the discount rate is moderate, there will be no significant differences in sales of the promoted brand between a percentage-off discount and a dollar-off discount. However, sales of either a percentage-off or a dollar-off discount will be significantly higher than that of a simple discount.

Unlike $H_{6a}$ and $H_{6b}$ that used survey data, testing $H_{6c}$ was completed using store sales data. Figure 13 demonstrates the number of chicken burritos and the number of other food items sold during Mondays in the study period. The actual sales volumes were similar across all the four test conditions in Experiment II, from 203 to 205 items in total.

A binary logistic regression was conducted to examine whether the actual sales volumes were significantly different between the four promotion conditions. The results from the logistic regression indicated that discount frame predicted significantly the sales of the chicken burritos across all conditions ($\chi^2(3) = 39.53, p < .01$).
Table 31 shows that the difference in sales when switching from the percentage-off to the dollar-off frame was non-significant (β = -.13, \( p > .12 \)). Descriptive results (Table 26) demonstrated that the chicken burrito sales accounted for 34.6% of the total number of food items sold in the percentage-off condition. This was higher than the 31.8% of the total sales accounted by the dollar-off promotion. Switching from the dollar-off frame to the percentage-off frame increased the sales of chicken burritos by 2.8%.

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME</td>
<td>35.38</td>
<td>3</td>
<td></td>
<td>&lt;.001</td>
<td>.88</td>
</tr>
<tr>
<td>25% off vs. $2 off</td>
<td>-.13</td>
<td>.35</td>
<td>1</td>
<td>.552</td>
<td>.88</td>
</tr>
<tr>
<td>25% off vs. $5.95</td>
<td>-.78</td>
<td>11.43</td>
<td>1</td>
<td>.001</td>
<td>.46</td>
</tr>
<tr>
<td>25% off vs. no discount</td>
<td>-1.37</td>
<td>18.72</td>
<td>1</td>
<td>&lt;.001</td>
<td>.25</td>
</tr>
<tr>
<td>Constant</td>
<td>-.63</td>
<td>25.59</td>
<td>1</td>
<td>&lt;.001</td>
<td>.53</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient

Table 32

Effects of Discount Frame on Sales of the Chicken Burrito – A Simple Discount as Baseline

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>Wald</th>
<th>Df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRAME</td>
<td>35.36</td>
<td>3</td>
<td></td>
<td>&lt;.001</td>
<td></td>
</tr>
<tr>
<td>$5.95 vs. 25% off</td>
<td>.78</td>
<td>11.43</td>
<td>1</td>
<td>.001</td>
<td>2.17</td>
</tr>
<tr>
<td>$5.95 vs. $2 off</td>
<td>.65</td>
<td>7.89</td>
<td>1</td>
<td>.005</td>
<td>1.92</td>
</tr>
<tr>
<td>$5.95 vs. no discount</td>
<td>-.60</td>
<td>4.57</td>
<td>1</td>
<td>.033</td>
<td>.55</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.41</td>
<td>64.02</td>
<td>1</td>
<td>&lt;.001</td>
<td>.24</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)
Table 32 illustrates that the simple discount generated significantly less sales of the chicken burritos than the percentage-off discount ($\beta = .65, p < .0083$) and the dollar-off discount ($\beta = .78, p < .0083$). In congruence to expectation, the two formats that featured saving frame either in percentage-off or in dollar-off produced significantly greater sales than the equivalent discount format that did not. Accordingly, presenting the discount either in a percentage-off frame or in a dollar-off frame improved sales significantly from the no-discount promotion that does not include saving frame. These findings supported for $H_{6c}$.

Finally, Table 33 shows that the control no-discount promotion produced significantly fewer sales of the chicken burritos than the percentage-off discount and the dollar-off discounts (both $p < .0083$). In addition, the simple discount promotion had higher sales than the no-discount promotion ($p = .033$). However, the differences in sales between these two conditions was marginal ($0.083 < p < .05$).

**TABLE 33**

| Effects of Discount Frame on Sales of the Chicken Burrito – A No-Discount Promotion as Baseline |

<table>
<thead>
<tr>
<th>FRAME</th>
<th>B</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>No discount vs. $2$ off</td>
<td>1.37</td>
<td>27.45</td>
<td>1</td>
<td>&lt;.001</td>
<td>3.95</td>
</tr>
<tr>
<td>No discount vs. 25% off</td>
<td>1.25</td>
<td>22.35</td>
<td>1</td>
<td>&lt;.001</td>
<td>3.49</td>
</tr>
<tr>
<td>No discount vs. $5.95$</td>
<td>.60</td>
<td>4.57</td>
<td>1</td>
<td>.033</td>
<td>1.82</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.01</td>
<td>85.44</td>
<td>1</td>
<td>&lt;.001</td>
<td>.13</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)
Additional findings – Effects of past visit frequency on consumer response to discount promotions

Similar to Experiment I, additional analyses were conducted to assess whether buyers’ past visit frequency to the restaurant could influence the effect of discount framing on their response to discount promotions in Experiment II. Past visit frequency to the restaurant was included in the ANOVA and Logistic Regression analyses that examined the impact of discount framing on consumer responses to the discounted chicken burritos.

The key results of the new analyses remained unchanged from those of the previous analyses when past visit frequency to the restaurant was not included in the tests. Past visit frequency showed no significant impact on buyer’s perceived value of the deal, their IRP and their reported purchase the discounted chicken burritos. This confirms that past visit frequency to the restaurant played no significant role in influencing buyer responses to the price discounts in Experiment II.

| Table 34 |
| Effects of Discount Rate on Perceived Value and Internal Reference Price of the Chicken Burritos with Store Frequency as Covariate |
| Effect | Wilks' Lambda | F | Hypothesis df | Error df | Sig. |
| Intercept | .034 | 2234.33 | 2 | 155 | <.01 |
| STORE FREQ | .97 | 2.06 | 2 | 155 | .13 |
| FRAME | .84 | 4.86 | 2 | 155 | <.01 |
Table 35

Effects of Discount Frame, Perceived Value, Internal Reference Price and Store Frequency on Reported Sales of the Chicken Burritos

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>Sig.</th>
<th>Exp(B)</th>
</tr>
</thead>
<tbody>
<tr>
<td>STORE FREQ</td>
<td>-.009</td>
<td>.04</td>
<td>.07</td>
<td>1</td>
<td>.80</td>
<td>.99</td>
</tr>
<tr>
<td>FRAME</td>
<td>_</td>
<td>_</td>
<td>1.54</td>
<td>3</td>
<td>.67</td>
<td>_</td>
</tr>
<tr>
<td>PERCEP</td>
<td>.55</td>
<td>.28</td>
<td>3.80</td>
<td>1</td>
<td>.05</td>
<td>1.74</td>
</tr>
<tr>
<td>IRP</td>
<td>.13</td>
<td>.11</td>
<td>1.33</td>
<td>1</td>
<td>.25</td>
<td>1.11</td>
</tr>
<tr>
<td>Constant</td>
<td>-3.77</td>
<td>1.30</td>
<td>8.47</td>
<td>1</td>
<td>&lt;.01</td>
<td>.02</td>
</tr>
</tbody>
</table>

B = logit coefficient, Exp(B) = exponentiated coefficient (odds ratio)
SUMMARY

In experiment II, buyers exposed to the percentage-off discount (regular $7.95, 25% off, today $5.95) and the dollar-off discount (regular $7.95, $2 off, today $5.95) showed no differences in their perceived value of the chicken burrito. Buyers’ perceived values in these two discounts were more favourable than the simple discount (regular $7.95, today $5.95). Although the differences between the three discount formats were congruent to expectation, pairwise comparisons did not show significant results. Thus, H6a was not supported.

In addition, buyers did not seem to change their estimates of IRP significantly across discount and no-discount promotions. The non-significant pairwise comparisons could not lend support to H6b.

Sales of chicken burritos were highest between for the percentage-off discount and the dollar-off discount. The sales volumes in these two conditions were significantly higher than that in the simple discount condition. Therefore, H6c was supported.

Finally, the effectiveness of price promotions was largely confirmed by comparing the three discount conditions with the control no-discount condition. In the most part, the results from the control condition were the least favourable among all testing conditions. The exception was in the test of IRP, in that buyers exposed to the no-discount promotion did not indicate significantly lower estimates of IRP than those exposed to either one of the three discounts. Table 36 summarises the findings of hypotheses testing in Experiment II.
### TABLE 36
Summary of Hypotheses Testing Results in Experiment II

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>H₆a</strong></td>
<td>When the discount rate is moderate, there will be no significant differences in perceived value of the promoted brand between buyers exposed to a percentage-off discount and those exposed to a dollar-off discount. However, the perceived value of buyers exposed to either a percentage-off or a dollar-off discount will be significantly higher than those exposed to a simple discount.</td>
</tr>
<tr>
<td><strong>H₆b</strong></td>
<td>When the discount rate is moderate, there will be no significant differences in estimates of internal reference price of the promoted brand between buyers exposed to a percentage-off discount and those exposed to a dollar-off discount. However, the estimates of internal reference price of buyers exposed to either a percentage-off or a dollar-off discount will be significantly higher than those exposed to a simple discount.</td>
</tr>
<tr>
<td><strong>H₆c</strong></td>
<td>When the discount rate is moderate, there will be no significant differences in sales of the promoted brand between a percentage-off discount and a dollar-off discount. However, sales of either a percentage-off or a dollar-off discount will be significantly higher than that of a simple discount.</td>
</tr>
</tbody>
</table>
CHAPTER SEVEN

DISCUSSION AND CONCLUSION

This thesis investigates the effects of percentage versus dollar framing on consumer responses to discount brands at two fast-food outlets. By doing so, this thesis extends the literature on percentage versus dollar framing that has been dominated by laboratory-based experiments to date. Through the two different field experiments, it has been shown that the effects of discount framing in actual retail settings are quite modest.

Experiment I took place at a franchised coffee shop. The focus was to examine the interaction effects between the discount rate (moderate vs. small) and the discount frame (percentage-off vs. dollar-off). When the discount rate was small (10% price reduction), presenting the discount in the dollar-off frame (regular price $4, 40 cents off) did not change buyers’ perceived value, their estimates of IRP, or their purchase behaviour, when compared to the equivalent percentage-off frame (regular price $4, 10% off). Similarly, when the discount rate was moderate (25% price reduction), Experiment I found no differences in buyer responses between the percentage-off discount (regular price $4, 25% off) and the dollar-off discount (regular price $4, $1 off).

Experiment II was conducted at another franchised fast-food restaurant. The second experiment supported the findings from Experiment I about the effects of discount framing at a moderate discount rate. When the discount rate was moderate (25% price reduction), Experiment II showed no significant differences between buyer responses to the percentage-off discount (regular price $7.95, 25% off, today $5.95) and the dollar-off discount (regular price $7.95, $2 off, today $5.95) of the promoted chicken burrito.
Nevertheless, the actual sales of chicken burritos in these two discount conditions were significantly higher than that of the simple discount format (regular price $7.95, today $5.95). In general, the two discount formats that contain saving frames, either in percentage-off or dollar-off format, outperformed the simple discount format in terms of total sales of the discounted items. This evidence supports the use of either of the saving frame in presenting price promotions.

**LIMITATIONS AND OPPORTUNITIES FOR FUTURE RESEARCH**

**Effects of Percentage versus Dollar Framing at a High Discount Rate**

This thesis only examines the effects of percentage versus dollar framing at small and moderate discount rates. There is no present research on the effects of percentage versus dollar framing at high discount rate in real-world consumption environments. Previous studies in laboratory settings have found that a small, moderate, or high level of the discount rate can lead buyers to engage in different degrees of product evaluation (Darke, Freedman, and Chaiken 1995; Grewal, Marmorstein, and Sharma 1996). This suggests that discount framing effects at a high discount rate may be different from those at small and moderate rates. Therefore, future studies could extend this thesis by testing percentage versus dollar framing effects at small, moderate and high discount rates in real-world consumption settings.

**Product and Store Choice**

The findings from this thesis have been derived from two purchase scenarios that involved low-cost and frequently purchased items. Future studies can examine the effects of percentage versus dollar framing across other low-cost, frequently purchased products to check whether the findings of these two field experiments hold true with these other product categories. It is unknown whether the percentage versus dollar framing would have different effects when the research related to products that are
expensive or irregularly purchased. Future studies can also extend the investigation of the real-world effects of discount framing to include a wider range of products.

For retailers that are aware of the potential impact of discount framing in buyer behaviour, it is tempting to feature all available pricing information to avoid sub-optimal presentation of their price promotions (e.g., regular $7.95, save 25% or $2 off, now $5.95). This thesis was limited to three discount frames; the percentage-off, dollar-off and simple frames. Future research can include multiple discount frames to examine the effects of discount framing in actual retail environments.

**Research methodology**

There are methodological limitations with Experiment I and II. First, Experiment I did not provide a specific regular price for the promoted muffins, instead presenting the price range as “from $4”. All the promoted muffins usually cost $4 each. For small value purchases like muffins, it is argued that consumers would adopt $4 as the regular price in estimating their IRP, although this might not be the case.

Second, comprehensive manipulation checks could not be obtained in both experiments because it was very difficult to check whether all buyers noticed the promotions. Instead, checks of how many buyers actually noticed the promotions were obtained only among surveyed buyers. Future studies could address this issue with the support of technology such as eye-tracking (Otterbrings et al. 2014; Pieters, Wedel, and Zhang 2007; Van Der Lans, Pieters, and Wedel 2008).

Third, the perceived value of the deal variable was measured with a five-point scale in Experiment I and II. Because variables measured with five-point scales tend to have more ordinal than interval properties, treating them with parametric methods such as analysis of variance and correlation might not be appropriate (Norman 2010). This practice has been criticised but not uncommon in social research (Jamieson 2004).
Despite this debate, it has been suggested that sample size and variable distribution play more important roles than the level of measurement in determining whether it is appropriate to use parametric methods to analyse variables measured with five-point scales (Knapp 1990; Norman 2010).

DISCUSSION

The findings of the current field experiments contribute to the understanding of a number of key questions about discount promotion that are relevant to both practitioners and researchers alike. This thesis has so far provided some additional insights to several issues in the literature of percentage versus dollar framing.

Using Percentage-off and Dollar-off Frames in Presenting Discount Promotions

Experiment II has showed that the percentage-off (regular $7.95, 25% off, today $5.95) and the dollar-off frames (regular $7.95, $2 off, today $5.95) generated significantly higher sales of chicken burritos than the simple discount frame (regular $7.95, today $5.95). As a result, including saving frames, either as percentage-off or dollar-off, could improve sales of the discount brand beyond that of the simple discount format.

This is likely because consumers are known to react positively to the indication of savings, without knowing the actual monetary benefits provided by the promotion (Inman, McAlister, and Hoyer 1990; Mayhew and Winer 1992). Furthermore, saving information presented in either a percentage-off or a dollar-off frame highlights explicitly the monetary benefits involved with buying the discount brand. On the contrary, the simple discount format only implies that the sales price of the brand has been reduced. Therefore, the positive connotation carried by the saving information improved sales of the chicken burritos.
Although the sales of the chicken burritos increased with the use of the percentage-off and the dollar-off format, the total sales of all food items in these two conditions were similar to the regular discount and the no discount (control) condition. In this case, changing discount format re-distributed sales to the targeted product but did not improve the overall volume of sales.

The implication here is twofold. First, the discount framing that is a subtle change in price presentation might not lead to an overall improvement in business bottom line. Second, and more importantly, it should be used as a targeted tactic to improve sales of particular products in store without increasing or decreasing overall store sales. This could lead to improved stock management and assists other marketing tactics such as product introduction strategy. Hence, understanding the phenomenon of discount framing could be particularly useful for store managers.

**Effects of Discount Rate in Current Purchase Decision**

Experiment I found a positive effect of the discount rate on buyers’ evaluation and their purchase of the discounted item. Increasing the discount rate from 10% to 25% led to a significant improvement in buyers’ perceived value of the discounted muffins. These significant findings from Experiment I are analogous to previous studies (e.g., Della Bitta, Monroe, and McGinnis 1981; Hardesty and Bearden 2003).

Increasing the discount rate from 10% to 25% improved the reported purchases of the discounted muffins by 12%. This equates to a price elasticity of -0.8, meaning that a 10% decrease in price (i.e., a 10% increase in discount rate) could lead to 8% increase in the reported sales volume of the discounted muffins. This indicates that buyers in Experiment I were not as sensitive to price changes as expected.

There are many factors that could reduce the price elasticity. Given the low cost and the frequent nature of the purchase, personal preference for a specific type of muffin
might have a stronger effect than a price discount in dictating buyer choices. Buyers could purchase the product that suits their preference although that means missing out on a discount.

**Effects of Perceptions of Value and Internal Reference Price in Purchase Decisions**

It was hypothesised that buyers’ perceived value of the discounted item and their estimates of IRP were associated with whether or not they would purchase the discounted item. It was found in Experiment I that the perceived value of the deal had a significant effect on the reported sales of muffins whereas IRP did not. Customers who had more favourable perceived value toward the discounted muffins were more likely to report buying these muffins. On the other hand, customers who had high estimates of IRP were as likely to buy the discounted muffins as those with lower estimates of IRP.

One possible explanation for the insignificant effect of IRP on the reported purchase of muffins in Experiment I could be due to the cross-sectional nature of the price promotions. It has been suggested that buyers are less likely to make use of their IRP knowledge in purchase decisions if they have not been exposed to the discounted promotions recently (Lattin and Bucklin 1989; Mazumdar, Raj, and Sinha 2005). In order to avoid data duplicates, the sampling nature in Experiment I dictates that participants were chosen because they were less like to have seen the price promotions earlier. As a result, most of the participants might not have recent exposure to the price of the discounted muffins. This might be why buyers in Experiment I were not confident in relying on IRP to evaluate the muffin deal.

In general, the current findings support the conclusion from previous research that participants’ perceived value of a discount item has more direct effect on their purchase behaviour than their IRP (Dodds, Monroe, and Grewal 1991, Grewal et al. 1998; Zeithaml 1988). At the very least, this conclusion holds among low-cost and frequently
purchased products like the muffins tested in Experiment I. Perhaps when the product becomes more expensive or less familiar, buyers would need to assess their purchases more thoroughly, which requires the use of both buyers’ perceived value and their IRP to evaluate the offer value (Lichtenstein, Karson, and Burton 1981; Thaler 1985).

**Effects of Discount Rate on Estimates of Internal Reference Price**

*Discount rate and buyers’ estimates of internal reference price*

Experiment I has found that discount rate did not have significant effects on buyers’ estimates of IRP. Contrary to expectation, increasing the discount rate from small (10%) to moderate (25%) did not lower buyers’ estimates of IRP for the muffins.

Customers’ IRP can be eroded over time with repeated exposures to discount prices (Alba et al. 1994, 1999; Kalwani and Yim 1992). Therefore, buyers may not adjust their IRP when they perceive that a discount promotion is a temporary and not a signal of a permanent price reduction (Chen, Monroe, and Lou 1998; Sinha and Smith 2000). In this case, buyers in Experiments I and II may perceive the available promotions as temporary incentives and choose not to adjust their IRP. This is to avoid feeling disappointed in the next purchase occasion when the price of the current item moves back to the normal retail level.

Alternatively, previous research has suggested that buyers’ IRP is an “acceptable price range” rather than a specific point estimate (e.g., Biswas and Blair 1991; Lichtenstein and Bearden 1989). As long as the change in sales price deviates within the expected price range, buyers may not adjust their IRP. In a study on the effects of the discount rate on price expectations, Kalwani and Yim (1992) showed that changes in discount rate of up to 30% off the regular price did not significantly reduce buyers’ price expectations for an electronic calculator.
Accordingly, buyers in this study might have a wide range of acceptable prices for the promoted muffins and chicken burritos, both of which are low-cost frequently purchased items. If this is true, buyers might choose not to adjust their IRP in the presence of even moderate price promotions.

The lack of a significant effect of the discount rate on IRP in Experiment I might imply that retailers could offer small- to moderate-sized discounts without significantly changing the price expectation of the buyers. This potentially means good news for fast-food retailers who can now offer more incentive for buyers without eroding buyer’s estimates of IRP for the promoted products. However, verification of this proposition is open for future studies of fast-food promotions.

**Discount framing and buyers’ estimates of internal reference price**

Both Experiment I and II have demonstrated non-significant effects of discount framing on buyers’ estimates of IRP. Switching from percentage-off to equivalent dollar-off discounts had no impact on buyers’ estimates of IRP. This result contradicts the Chandrashekaran and Grewal study (2006), in which participants who viewed a price promotion for AA batteries adjusted their IRP to a greater degree after being exposed to a dollar-off frame than to a percentage-off frame.

In supporting the current thesis, DelVecchio, Lakshmanan, and Krishnan (2009) did not find significant effects of discount framing on buyers’ estimates of IRP. Participants in that study viewed a range of shampoo brands that were presented in equivalent discount formats, but showed no adjustments to their IRP between framing conditions.

It is suspected that the choice of a less familiar test product (i.e., AA batteries) by Chandrashekaran and Grewal (2006) may influence the effects of discount framing these authors obtained. Participants who face unfamiliar products may be more likely to
rely on external pricing information to adjust their IRP, compared to those who face more familiar products such as shampoo.

Effects of Framing a Small Discount in Percentage-off or Dollar-off Format in purchase behaviour

Central to this thesis is the examination of the interaction effects between the discount rate and the discount framing in real-life retail environments. In Experiment I, framing a small discount either in a percentage-off (regular $4, 10% off) or a dollar-off format (regular $4, 40 cents off) did not lead to significant changes in consumer’s perceived value and their reported purchase of the discounted muffins.

This finding seems contradictory to that found by Chen, Monroe, and Lou (1998). In their experiment, student participants were asked to imagine that they were considering buying of a box of floppy disks when encountering a discount for a premium (i.e., more expensive) version of the same product. Participants were asked to rate this new and more expensive version. At a 10% discount rate, participants’ perceptions of the offer value were significantly higher for a percentage-off discount (save 10%) than a dollar-off discount (save $1). Unlike other framing experiments that were confined within a product-purchase scenario, the purchase scenario in Chen, Monroe, and Lou’s (1998) experiment might have prompted the participants to compare the value of the regular and the premium model of floppy disks. This would have made them more susceptible to discount framing effects.

On the other hand, the findings from Experiment I were supported by a majority of other studies in the literature (Chandrashekaran and Grewal 2006; Chen, Monroe, and Lou 1998; DelVecchio, Krishnan, and Smith 2007; Gendall et al. 2006). In particular, Experiment I has confirmed that framing a price promotion in a dollar-off format or a
percentage-off format does not have significant effects on buyers’ perceived value, their estimates of IRP, and their purchases in an actual retail environment.

**Effects of Framing of a Moderate Discount in a Percentage-off or a Dollar-off Format in Purchase Decisions**

Experiments I and II showed that the effects of percentage versus dollar framing were not significant when the muffins and chicken burritos were discounted at a 25% rate. The effects of the percentage versus dollar framing were not significant for buyers’ perceived value of the promoted items, their estimates of IRP, and their purchase of the promoted items.

At first, the current findings seem contradictory to the significant effects of discount framing found in previous laboratory-based experiments (e.g., DelVecchio, Lakshmanan, and Krishnan 2009; Kim and Kramer 2006; Gendall et al. 2006). One explanation for the lack of significant effect of discount framing may be because buyers evaluate purchase value more carefully in real-world environments compared to laboratory-based settings. This in turn could have diminished the discount framing effects that could be discovered in field research.

However, this explanation could not be supported with findings from Experiment II. In particular, it was found that sales of the discounted chicken burritos in both the percentage-off or the dollar-off discount condition were significantly higher than sales in the simple discount condition. Because the three formats are logically equivalent, the significant differences in sales provide support for the existence of discount framing effects in real-world consumption settings. In other words, buyers in Experiment II purchased significantly different amounts of chicken burritos when they were presented with equivalent discount formats. This supports the argument that consumers do not
process information thoroughly in small purchase decisions and that discount framing effects do exist in real-life retail settings.

In contrast to Chandrashekaran’s (2004) suggestion that discount framing effects may not occur because buyers are rational and should respond to equivalent discounts in similar ways, Experiment II showed that this is not the case. The actual sales of chicken burritos differed significantly among the three equivalent discount formats.

Another potential explanation for the lack of significant effects of discount framing is the ease of purchase evaluation (DelVecchio, Krishnan, and Smith 2007). One could argue that the discount formats used in Experiment I (regular $4, 25% off and regular $4, $1 off) were easy to evaluate because there were no decimal numbers involved in the prices. Therefore, buyers would have no difficulty in computing the value of either discount format. This would result in a quick and accurate estimate of purchase value. This could potentially explain for the lack of discount framing effects in Experiment I.

However, Experiment II exposed buyers to more difficult discount formats that involved decimal values (i.e., regular $7.95, save 25%, today $5.95 and regular $7.95, save $2, today $5.95). It still found insignificant effects on the responses to percentage versus dollar framing. As a result, the non-significant effects of percentage versus dollar framing found across both field experiments in this thesis could not be attributed to the ease of processing purchase value.

The discussion in this section has eliminated several alternative explanations for the non-significant effects of percentage versus dollar framing consistently found in Experiment I and II. The lack of discount framing effects found in this research was less likely to occur because buyers were rational in their purchase decision or because the discount promotion formats were easy for buyers to process. Indeed, the non-significant differences between a percentage-off and a dollar-off format demonstrated in this thesis
are more likely to reflect the modest effects of discount framing outside laboratory research environments.

**Relative Effects of Discount Framing on Buyer Responses to Price Promotions**

Experiment II showed that changing from a dollar-off format to a percentage-off format improved the sales of the chicken burritos by 3%. In Experiment I, switching discount format in the same direction improved the reported sales of the muffins by 7.3%. On the surface, these figures seemed small and did not provide statistically significant support for the effects of discount framing on buyer responses to price promotions. One might suggest that discount framing, which involves a relatively subtle change to the presentational format of price promotion, does not have an impact on consumer behaviour in live retail environment. This proposition is in contrast to what has been shown through previous laboratory research (e.g., Chen, Monroe, and Lou 1998; DelVecchio, Krishnan, and Smith 2007).

The magnitude of discount framing effects found in Experiment I is in line with what has been found in the literature of comparative price advertisement (Berkowit and Burton 1980; Dodds, Monroe, and Grewal 1991; Lichtenstein, Burton, and Karson 1991). For instance, when participants considered buying an electronic calculator, Lichtenstein, Burton, and Karson (1991) observed that price presentation cues (e.g., “seen elsewhere $88, here $79” vs. “was $88, now only $79”) explained between 3% and 5% of the variance in IRP and perceived value.

Furthermore, the discount framing effects found in Experiment I and II are more significant and meaningful than they appear to be for two reasons. First, these effects were obtained from field studies in which many nuisance variables could not be controlled. In contrast, researchers in contrived laboratory experiments typically can
eliminate unwanted variables and allow only key predictors of consumer behaviour, such as the discount frame, to vary.

The current thesis has limited the potential impact of nuisance variables by maintaining consistency across experimental conditions. This was achieved by running field experiments on the same days of the week and same time periods during those days, following exactly the same data collection procedure. However, there are other nuisance variables that could not be controlled for in Experiment I and II. For instance, one could argue that different months of the year would attract slightly different groups of customers. Christmas and school holiday periods are could attract a higher proportion of school children and their parents visiting these fast-food venues than at any other times. These customers might react differently to the same discount promotions compared to other customer groups.

To address this issue, researchers would extend the current experiments to offer the same promotion at the same time over the course of the year. However, this lengthy time frame not only makes the experiments considerably more difficult to implement, but also introduces even more nuisance variables into the experiment. Therefore, due to practical restrictions, it is more difficult for the current experiments, compared to previous laboratory experiments, to reveal a clear and significant effect of discount frames.

From this perspective, strictly controlled laboratory experiment and field experiment are the two extremes of the research continuum. As one moves from the former to the latter extreme, it becomes increasingly more difficult to detect the impact of discount frame on consumer behaviour. The current thesis lies at the latter extreme where it is most difficult to detect the effects of rather subtle variations in discount frames on consumer response to price discounts.
More importantly, even within strictly controlled laboratory experiments the discount framing effects on consumer behaviour could become increasingly more difficult to detect as the number of predictors included in the study increases. For instance, Morwitz, Greenleaf and Johnson (1998) found that discount frame had significant effects on the way buyers processed and reacted to the discount prices when it was the sole predictor tested. Nevertheless, when other attributes of the discount promotion were included as predictors, discount framing has been shown to have only low impact on consumer response to sales promotions (e.g., Chen, Monroe and Lou 1998; Della Bitta, Monroe and McGinnis 1981). For instance, Della Bitta, Monroe and McGinnis (1981) found that the discount rate and the product’s base price, rather than the discount frames, had significant influences on buyers’ willingness to purchase the discounted items.

The above discussion has demonstrated that as the number of predictors in an experiment increases, it becomes more difficult to detect the effect of discount frame on consumer behaviour. This is not to mention that the potential effects of discount frame on buyer behaviour if they exist would be on the smaller side compared to the discount rate, the brand name, and the product’s base price (Chen, Monroe and Lou 1998; Della Bitta, Monroe and McGinnis 1981; Gendall et al. 2006). As a result, it is difficult even for controlled laboratory experiments to detect the subtle changes in consumer behaviour when the discount frame is switched between percentage-off and dollar-off formats (Cavana, Delahaye and Sekaran 2001).

In general, using actual retail environments makes the results obtained from Experiment I and II significant for two reasons. First, the phenomenon of percentage versus dollar framing does not occur within strictly controlled laboratory-based environment. By extending the findings from previous laboratory research, the current
thesis provides valuable insights on the effects discount framing could have on fast-food restaurant patrons.

Second, the results from the current thesis are also significant because the magnitudes of the discount framing effects found in Experiment I and II are actually on par with previous studies conducted in the laboratory-based environments (Berkowitz and Burton 1980; Dodds, Monroe, and Grewal 1991; Lichtenstein, Burton, and Karson 1991). Experiment I and II have found that by changing the format of the discount promotion, retailers can improve sales of a discount brand by up to 7.3%. Therefore, proper formatting of the price promotion can increase sales, and improve the short-term effectiveness of sales promotions, without changing the saving value offered to buyers.

**Conclusion on the Effects of Percentage versus Dollar Framing in Real-World Environments**

This thesis extends the literature on percentage versus dollar framing by conducting field experiments to investigate whether the effects of this framing phenomenon on consumer behaviour could exist in actual retail settings. By doing so, this thesis fulfils a methodological gap in the literature that has been dominated by laboratory-based research to date.

Through two different field experiments, it has been shown that the effects of discount framing are quite modest on buyer responses to price promotions in actual retail settings. Presenting a discount in percentage-off formats prompted no significant differences in buyers’ perceptions of the offer value, their estimates of IRP of the brand, and their purchase behaviour compared to equivalent dollar-off formats. The non-significant effects were found at both small and moderate levels of the discount rate.
However, Experiment II showed that the discount framing phenomenon could still have significant effects on buyer behaviour. Both the percentage-off and the dollar-off format attracted higher sales of the discounted chicken burritos than the simple dollar-off format. Accordingly, the inclusion of saving value, presented in either a percentage-off or a dollar-off frame, was a beneficial tactic to improve sales of the discount brand.

Furthermore, the current findings have significant implications for marketing practitioners and retailers. Across the two experiments, changing from a dollar-off format to an equivalent percentage-off format was shown to improve the reported sales of the discount brand by up to 7.3%. Given how often retailers make use of percentage-off and dollar-off in their price promotions, a small improvement can make a significant difference in sales promotion effectiveness and hence improve retailers’ profitability.
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Dear Professor Mizerek

HUMAN RESEARCH ETHICS APPROVAL - THE UNIVERSITY OF WESTERN AUSTRALIA
The study of framing effects on coupon redemption-food and beverage retail businesses in Australia

Student(s): Thang Pham - PhD - 2040387*, Cao Pham

Ethics approval for the above project has been granted in accordance with the requirements of the National Statement on Ethical Conduct in Human Research (National Statement) and the policies and procedures of The University of Western Australia. Please note that the period of ethics approval for this project is five (5) years from the date of this notification. However, ethics approval is conditional upon the submission of satisfactory progress reports by the designated renewal date. Therefore initial approval has been granted from 31 May 2012 to 01 June 2013.

You are reminded of the following requirements:

1. The application and all supporting documentation form the basis of the ethics approval and you must not depart from the research protocol that has been approved.
2. The Human Research Ethics Office must be approached for approval in advance for any requested amendments to the approved research protocol.
3. The Chief Investigator is required to report immediately to the Human Research Ethics Office any adverse or unexpected event or any other event that may impact on the ethics approval for the project.
4. The Chief Investigator must inform the Human Research Ethics Office as soon as practicable if a research project is discontinued before the expected date of completion, providing reasons.

Any conditions of ethics approval that have been imposed are listed below:

Special Conditions

None specified

The University of Western Australia is bound by the National Statement to monitor the progress of all approved projects until completion to ensure continued compliance with ethical standards and requirements.

The Human Research Ethics Office will forward a request for a Progress Report approximately 60 days before the due date. A further reminder will be forwarded approximately 30 days before the due date.

If your progress report is not received by the due date for renewal of ethics approval, your ethics approval will expire, requiring that all research activities involving human participants cease immediately.

If you have any queries please do not hesitate to contact the Human Research Ethics Office (HREO) at hreosresearch@uwa.edu.au or on (08) 6488 3703.

Please ensure that you quote the file reference – RA:4/1/5417 – and the associated project title in all future correspondence.

Yours sincerely

Peter Johnstone
Manager

~ 185 ~
Imagine you’re visiting a food court inside a large shopping centre. A café is having a promotion that gives you 10% discount on its “Premium Delight” muffin which usually costs $4. The discount is equivalent to 40 cents. Please rate this promotion.

<table>
<thead>
<tr>
<th>10% discount on $4 muffin</th>
<th>Rating</th>
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<tbody>
<tr>
<td>This muffin promotion is a great deal</td>
<td>Strongly disagree</td>
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<tr>
<td>The sale price is less than what I expect it to be</td>
<td>1</td>
</tr>
<tr>
<td>At this price, I would save a lot of money</td>
<td>1</td>
</tr>
<tr>
<td>The sale price is less than what other retailers charge for similar products</td>
<td>1</td>
</tr>
<tr>
<td>The promotion appears to be a bargain</td>
<td>1</td>
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</tbody>
</table>

Please estimate...

- The most you are willing to pay for this type of muffin $___________________
- The price you consider acceptable for a similar muffin $___________________
- The least you expect to pay for a similar muffin $___________________

About you

Gender  □ Male  □ Female

Age: ______________ years

Frequency of visiting cafés: ______________ times past 4 weeks

This survey has been approved by the UWA Human Research Ethics Office. Your responses in the survey are strictly confidential and cannot be identified later.
Imagine you’re visiting a food court inside a large shopping centre. A café is having a promotion that gives you 25% discount on its “Premium Delight” muffin which usually costs $4. The discount is equivalent to $1. Please rate this promotion.

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<th>25% discount on $4 muffin</th>
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Please estimate...

- The most you are willing to pay for this type of muffin $__________________
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About you

Gender □ Male □ Female

Age: ______________ years

Frequency of visiting cafés: ______________ times/past 4 weeks

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APPENDIX C

IN-STORE DISPLAYS

Display – “40 cents off”
Display – “10% off”
Display – “25% off”
Display – “$1 off”

Terms and conditions: Premium Delight range only. One discounted muffin per customer per day. Not applicable for 4- and 6-pack purchase. Offer valid at Muffin Break Carousel.
Surveys

Survey – “40 cents off”

**Did you take advantage of the “40 cents off Premium Delight muffin” promotion today?**

- [ ] Yes (please continue)
- [ ] No (please observe the promotion and rate it honestly)

**Please rate today's promotion**

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<th>Rating</th>
<th>Strongly disagree</th>
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**About you**

Gender
- [ ] Male
- [ ] Female

Age: __________ years

Frequency of visiting Muffin Break Carousel: ___________ times/past 4 weeks

Frequency of visiting cafés (incl. Muffin Break): ___________ times/past 4 weeks

**Personal contact details**

Provide the contact details if you’d like to enter into the competition to win 1 of 5 $30 Muffin Break vouchers 1, 2

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1 The contact details are strictly intended for the purpose of the random draw. Winners will be notified on 19/September/2012.

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Survey – “10% off”

Did you take advantage of the “10% off Premium Delight muffin” promotion today?

☐ Yes (please continue)

☐ No (please observe the promotion and rate it honestly)

Please rate today’s promotion

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<tr>
<th>Rating</th>
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About you

Gender  ☐ Male  ☐ Female

Age: ___________ years

Frequency of visiting Muffin Break Carousel: ___________ times/past 4 weeks

Frequency of visiting cafés (incl.Muffin Break): ___________ times/past 4 weeks

Personal contact details

Provide the contact details if you’d like to enter into the competition to win 1 of 5 $30 Muffin Break vouchers 1, 2

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Survey – “25% off”

Did you take advantage of the “25% off Premium Delight muffin” promotion today?

- Yes (please continue)
- No (please observe the promotion and rate it honestly)

Please rate today’s promotion

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Please estimate...

The most you are willing to pay for this type of muffin

$______________

The price you consider acceptable for a similar muffin

$______________

The least you expect to pay for a similar muffin

$______________

About you

Gender
- Male
- Female

Age: ___________ years

Frequency of visiting Muffin Break Carousel: ___________ times/past 4 weeks

Frequency of visiting cafés (incl. Muffin Break): ___________ times/past 4 weeks

Personal contact details

Provide the contact details if you’d like to enter into the competition to win 1 of 5 $30 Muffin Break vouchers 1, 2

Name: __________________________________________

Phone: _________________________________________

Email: __________________________________________

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(⇒ Turn page to enter competition)
**Survey – “$1 off”**

Did you take advantage of the “$1 off Premium Delight muffin” promotion today?

- [ ] Yes (please continue)
- [ ] No (please observe the promotion and rate it honestly)

**Please rate today’s promotion**

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<td>5</td>
</tr>
</tbody>
</table>

**Personal contact details**

Provide the contact details if you’d like to enter into the competition to win 1 of 5 $30 Muffin Break vouchers 1, 2

- Name: _________________________
- Phone: _________________________
- Email: _________________________

1 The contact details are strictly intended for the purpose of the random draw. Winners will be notified on 19/September/2012.

2 This survey is conducted jointly between Muffin Break Carousel and a research team at the UWA Business School. The survey has been approved by the UWA Human Research Ethics Office. Your responses in the survey are strictly confidential and cannot be identified later. Your personal contact details will not be used for any other purposes. For more information, please ask the store employees for a copy of the “Participant Information” sheet.

---

**Please estimate...**

- The most you are willing to pay for this type of muffin $__________
- The price you consider acceptable for a similar muffin $__________
- The least you expect to pay for a similar muffin $__________

**About you**

- Gender: [ ] Male  [ ] Female
- Age: ____________ years
- Frequency of visiting Muffin Break Carousel: ____________ times/past 4 weeks
- Frequency of visiting cafés (incl. Muffin Break): ____________ times/past 4 weeks

(* Turn page to enter competition *)
APPENDIX D

IN-STORE DISPLAYS

Display – “$2 off, today $5.95”
Display – “25% off, today $5.95”
Display – “today $5.95”

MONDAY MADNESS
Enjoy Chicken Fajita Burrito
today for only $5.95

Promotion subject to availability. Not available with any other discount.
Monday Madness
Enjoy Chicken Fajita Burrito
SURVEYS

Survey – “$2 off, today $5.95”

<table>
<thead>
<tr>
<th>Did you take advantage of the promotion today “$5.95 Chicken Fajita Burrito, save $2”?</th>
</tr>
</thead>
<tbody>
<tr>
<td>□ Yes (please continue)</td>
</tr>
<tr>
<td>□ No (please observe the promotion and rate it honestly)</td>
</tr>
</tbody>
</table>

**Please rate today’s promotion**

<table>
<thead>
<tr>
<th>Rating</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

**Please estimate...**

- The most you are willing to pay for a similar meal $________
- The price you consider acceptable for a similar meal $________
- The least you expect to pay for a similar meal $________

**About you**

- Gender □ Male □ Female
- Age: ___________ years
- Frequency of visiting Salsa’s Booragoon: _______ times/past 4 weeks
- Frequency of visiting fast food restaurants (incl.Salsa’s): _______ times/past 4 weeks

**Personal contact details**

<table>
<thead>
<tr>
<th>Provide the contact details if you’d like to enter into the competition to win 1 of 5 $50 Salsa’s vouchers 1, 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name: _______________</td>
</tr>
<tr>
<td>Phone number: _______________</td>
</tr>
<tr>
<td>Email: _______________</td>
</tr>
</tbody>
</table>

1 The contact details are strictly intended for the purpose of the random draw. Winners will be notified on 03/September/2012.

2 This survey is conducted jointly between Salsa’s Booragoon and a research team at the UWA Business School. The survey has been approved by the UWA Human Research Ethics Office. Your responses in the survey are strictly confidential and cannot be identified later. Your personal contact details will not be used for any other purposes. For more information, please ask the store employees for a copy of the “Participant Information” sheet.
Survey – “25% off, today $5.95”

Did you take advantage of the promotion today “$5.95 Chicken Fajita Burrito, save 25%?”

☐ Yes (please continue)

☐ No (please observe the promotion and rate it honestly)

Please rate today’s promotion

<table>
<thead>
<tr>
<th>Rating</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>This Chicken Fajita promotion is a great deal</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what I expect it to be</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>At this price, I would save a lot of money</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The sale price is less than what other retailers charge for similar product</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>The promotion appears to be a bargain</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Please estimate...

- The most you are willing to pay for a similar meal $______________
- The price you consider acceptable for a similar meal $______________
- The least you expect to pay for a similar meal $______________

About you

Gender ☐ Male ☐ Female

Age: ___________ years

Frequency of visiting Salsa’s Booragoon: ___________ times/past 4 weeks

Frequency of visiting fast food restaurants (incl. Salsa’s): ___________ times/past 4 weeks

Personal contact details

Provide the contact details if you’d like to enter into the competition to win 1 of 5 $50 Salsa’s vouchers.¹ ²

Name: __________________

Phone number: __________________

Email: __________________

¹ The contact details are strictly intended for the purpose of the random draw. Winners will be notified on 03/September/2012.

² This survey is conducted jointly between Salsa’s Booragoon and a research team at the UWA Business School. The survey has been approved by the UWA Human Research Ethics Office. Your responses in the survey are strictly confidential and cannot be identified later. Your personal contact details will not be used for any other purposes. For more information, please ask the store employees for a copy of the “Participant Information” sheet.
Survey – “today $5.95”

Did you take advantage of the promotion today “Monday special Chicken Fajita Burrito for $5.95”?

☐ Yes (please continue)

☐ No (please observe the promotion and rate it honestly)

Please rate today’s promotion

<table>
<thead>
<tr>
<th>Rating</th>
<th>Strongly disagree</th>
<th>Disagree</th>
<th>Neutral</th>
<th>Agree</th>
<th>Strongly agree</th>
</tr>
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<tbody>
<tr>
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<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
</tbody>
</table>

Please estimate...

- The most you are willing to pay for a similar meal: $___________
- The price you consider acceptable for a similar meal: $___________
- The least you expect to pay for a similar meal: $___________

About you

Gender  ☐ Male  ☐ Female

Age: ___________ years

Frequency of visiting Salsa’s Booragoon: ___________ times/past 4 weeks

Frequency of visiting fast food restaurants (incl.Salsa’s): ___________ times/past 4 weeks

Personal contact details

Provide the contact details if you’d like to enter into the competition to win 1 of 5 $50 Salsa’s vouchers 1,2

| Name: | __________________ |
| Phone number: | __________________ |
| Email: | __________________ |

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Turn page to enter competition
Survey – No Discount

Did you buy the Chicken Fajita Burrito today?

☐ Yes (please continue)
☐ No (please observe the product and rate it honestly)

Please rate the product

<table>
<thead>
<tr>
<th>Rating</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Disagree</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Neutral</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strongly agree</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

This Chicken Fajita meal is a great deal

| 1 | 2 | 3 | 4 | 5 |

The sale price is less than what I expect it to be

| 1 | 2 | 3 | 4 | 5 |

At this price, I would save a lot of money

| 1 | 2 | 3 | 4 | 5 |

The sale price is less than what other retailers charge for similar product

| 1 | 2 | 3 | 4 | 5 |

The meal appears to be a bargain

| 1 | 2 | 3 | 4 | 5 |

Please estimate...

| The most you are willing to pay for a similar meal | $___________ |
| The price you consider acceptable for a similar meal | $___________ |
| The least you expect to pay for a similar meal | $___________ |

About you

Gender  ☐ Male  ☐ Female

Age: __________ years

Frequency of visiting Salsa’s Booragoon: __________ times/past 4 weeks

Frequency of visiting fast food restaurants (incl. Salsa’s): __________ times/past 4 weeks

Personal contact details

Provide the contact details if you’d like to enter into the competition to win 1 of 5 $50 Salsa’s vouchers 1, 2

Name: __________________

Phone number: __________________

Email: ___________________

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