CONSUMERS’ USE OF AN EXPECTED FUTURE PRICE AS A REFERENCE: AN INVESTIGATION OF THE PSYCHOLOGICAL AND CONTEXTUAL ANTECEDENTS

BY

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DISSERTATION
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ABSTRACT

Consumers often use an expected future price of a product as a reference for judging the current price, and consequently make purchase decisions such as whether to buy and how much to buy. Extant literature has acknowledged the use of an expected future price of a product in formation of price judgments in relatively expensive and infrequently purchased product categories such as technological products and consumer durables. Although previous research has argued that consumers may also use an expected future price as a reference in the relatively inexpensive, frequently purchased categories such as consumer packaged goods, research has not clearly identified the factors that may lead consumers to use an expected future price as a reference in these product categories. The current dissertation research addresses this research gap in the extant literature by investigating the factors that may lead to the use of an expected future price of a product as a reference in formation of price judgments. Specifically, the current dissertation research argues for and provides evidence in support of the influence of contextual factors such as the frequency of price promotions, temporal pattern of price promotions, and price trends as the factors that may lead to the use of an expected future price as a reference. Further, the current research also discusses the influence of psychological factors such as consumers’ motivation to process price information and their mode of acquisition of price information in the use of an expected future price as a reference.

The current dissertation research contributes to marketing theory in the areas of behavioral pricing and consumers’ forward looking behaviors. In the area of behavioral pricing, this research contributes to the discussion on reference prices by identifying the factors that may lead to the use of expected future prices as a reference. In the area of consumers’ forward looking
behaviors, the current research contributes by showing direct evidence to the psychological mechanisms underlying the purchase timing and quantity decisions in response to the frequency and temporal pattern of price promotions.

The current dissertation research also contributes to managerial understanding of consumers’ likely responses to the frequency of price promotions, temporal pattern of price promotions, and price trends. The research findings suggest that when a brand is promoted frequently, it may influence consumers’ expectations about the future promotions, and consumers may try to postpone their purchases during a regular period to a promotional period. Further, the research findings suggest if a brand is promoted less frequently, then consistently (versus randomly) spaced promotions are less likely to lead to the use of expected future prices as a reference. The research findings imply that managers may want to promote their brands relatively infrequently and keep their price promotions consistently spaced in order to minimize the likelihood of purchase postponement during regular periods.
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Chapter 1

INTRODUCTION

Nature of the Research Problems

Consumers often anticipate future prices of a product, use the anticipated future prices to evaluate a current price of the product, and subsequently make purchase decisions such as buy now or later, or how much to buy. For example, an individual interested in purchasing an airline ticket may try to figure out likely future prices for the ticket, and then decide whether to buy the ticket now or wait for a likely lower price. Similarly, a consumer may decide to wait for a thanksgiving sale before purchasing an expensive television set, expecting a lower price during the sale. Alternately, another consumer may decide to purchase apparel ahead of a season, expecting a higher price as the season approaches. Indeed, consumers’ expectations about future prices of a product often influence their current purchase decisions. Extant literature has acknowledged that consumers often use an expected future price of a product to judge its current price, and consequently make purchase decisions in the technological and/or infrequently purchased, relatively expensive product categories (Holak, Lehmann, and Sultan 1987; Greenleaf and Lehmann 1995; Narasimhan 1989; Winer 1985).

Previous research has provided evidence to consumers’ use of an expected future price as a reference for evaluating a current price in the infrequently purchased, relatively expensive consumer durables. However, research is less forthcoming on the use of an expected future price as a reference in the frequently purchased, relatively less expensive consumer packaged goods categories. Early research in behavioral economics has suggested that consumers may use expected future prices of frequently purchased products for making current purchase decisions in
the context of an economic downturn (Katona 1974; 1975). Other research has also argued for the use of an expected future price as a reference in the frequently purchased product categories (e.g. Jacobson and Obermiller 1990, Kalyanaram and Winer 1995, Monroe 2003). However, prior research falls short of identifying the factors that may influence consumers to use an expected future price as a reference for judging a current price. The current dissertation research attempts to address this research gap by identifying and testing several contextual factors that may lead consumers to use an expected future price as reference price. This dissertation research also attempts to identify the psychological factors that serve as enabling or necessary conditions for the influence of the contextual factors on the use of an expected future price as a reference.

Importance of Research on Consumers’ Future Price Expectations

As stated earlier, consumers’ future price expectations often play an important role in their current price judgments and purchase decisions. Although the behavioral pricing literature related to reference prices has acknowledged that consumers may anticipate future prices of a product, and use the anticipated future prices to judge a current price, research does not clearly inform about the conditions under which such a behavior is likely to manifest. Specifically, a conceptual framework related to the factors that may lead consumers to anticipate future prices, and subsequently use the anticipated future prices for making current purchase decisions is lacking. Without an established conceptual framework, programmatic advancement in the understanding of consumers’ future price expectations appears muted.

Existing literature on consumers’ forward looking behavior has also acknowledged the possibility that consumers may anticipate future marketing activity and take their anticipations into consideration when making current purchase decisions. However, direct evidence of the
theoretical explanation underlying such anticipatory behavior is not available because the research on consumers’ forward looking behavior has primarily used modeling methodology that is constrained by cross-sectional data obtained from consumer scanner panels. Research is needed to first establish and then advance the knowledge on the psychological mechanisms related to consumers’ anticipatory behavior with regard to the expected future prices.

From a managerial or practical standpoint, it is important to clearly understand the psychographic and demographic factors related to consumer segments that are most likely to anticipate future prices of a product or brand. An understanding of these factors will likely enable managers to accurately segment and target consumers based on their propensity to use the expected future prices for making current purchase decisions. Consequently, managers may be able to customize their marketing mix variables across these consumer segments. Further, managers will also benefit from understanding the marketing actions that may lead specific consumer segments to use the expected future prices to make current purchase decisions. An understanding of the marketing actions influencing consumers’ use of the expected future prices will likely enable managers to accurately measure effectiveness of their marketing activity such as the frequency and temporal consistency of price promotions. Consequently, managers may be able to make changes to the timing of their price promotions to influence consumers’ forward looking behavior.

Research Gaps in Understanding of the Use of an Expected Future Price

A careful review of extant literature related to the influence of consumers' expectations about future prices of products on their evaluations of current prices and subsequent purchase decisions leads to the following research gaps in existing literature.
First, extant literature supports the idea that consumers may anticipate future prices of products, and use the anticipated future prices as a reference to judge a current price (Jacobson and Obermiller 1990; Monroe 2003). Holak, Lehmann, and Sultan (1987) found that consumers often use expected future prices to judge their current purchase decisions in product categories such as personal computers and video recorders. Similarly, Greenleaf and Lehmann (1995) also reported that consumers’ anticipated future prices influence their current purchases when the products are relatively expensive. Indeed, prior research seems to agree upon the notion that consumers’ anticipated future prices influence their judgments of current prices and current purchase decisions in technologically intensive, relatively expensive, infrequently purchase product categories. Prior research has argued that the infrequently purchased, relatively expensive product categories are typically discretionary, and thus can be postponed or advance-bought (Wood 2005). However, prior research is less certain about the influence of consumers’ anticipated or expected future prices in the frequently purchased, relatively lower priced product categories. The frequently purchased, relatively lower priced products are usually considered as necessities, and thus, consumers may not consider either postponing or forward-buying in these product categories (Winer 1985). Although Jacobson and Obermiller (1990) and Monroe (2003) have argued that consumers’ reference price can be a function of their expected future prices of a product, confirmatory evidence to this effect is lacking in the existing literature. Several research articles based on modeling methodology have argued for consumers’ use of an expected future price in the frequently purchased, relatively lower priced categories (Gönül and Srinivasan 1996; Mela, Jedidi, and Bowman 1998; Macé and Neslin 2004). However, due to the methodological constraints associated with modeling approach, more direct evidence of such an effect is not available. The modeling research is based on cross-sectional data obtained from consumer
scanner panels, and thus has had to assume that consumers use an expected future price as a reference, rather than obtaining direct evidence for this effect. Thus, one research gap related to the use of an expected future price as a reference pertains to a confirmation of the use of an expected future price as reference price in the frequently purchased, relatively lower priced product categories.

Second, although Jacobson and Obermiller (1990) and Monroe (2003) have argued for the use of an expected future price as reference price, previous research does not identify the psychological characteristics that may influence the use of an expected future price as a reference. Jacobson and Obermiller (1990) have acknowledged that consumers differ in the degree to which they perceive and use price related information, and that such consumer heterogeneity may relate to their use of an expected future price as reference price. Several other researchers have suggested that consumers differ in the ways they attend to, learn about, retain, and process price-related information (Ailawadi, Neslin, and Gedenk 2001; Babin, Gonzales, and Watts 2007; Mazumdar and Monroe 1990; Monroe and Lee 1999; Sinha and Batra 1999). For example, Mazumdar and Monroe (1990) found that the way -intentional versus incidental- consumers learn about price information influences their ability to recall past prices. Vanhuele and Drèze (2002) reported that consumers differ in terms of their search behavior for price information, and that the consumers who search relatively more than others are likely to perceive price patterns more accurately than the others. In short, these findings suggest that consumers are also likely to be heterogeneous in terms of their use of an expected future price as reference price. However, research is yet to identify the psychological factors that may differentiate consumers in terms of their propensity to use an expected future price as a reference price.

Third, previous research falls short of identifying the contextual factors that may
influence consumers to use an expected future price for making current purchase decisions. Prior behavioral research has posited that consumers’ reference prices are functions of their past experiences with price stimuli. For example, Della Bitta and Monroe (1974) and Adaval and Monroe (2002) reported evidence in support of adaptation level theory that suggests that consumers’ judgments of current prices are often based on their past experiences with prices. Specifically, when preceded by relatively higher (lower) past prices, consumers tend to judge a current price as less (more) expensive irrespective of its monetary value. Similarly, Nunes and Boatwright (2004) also showed that randomly encountered prior prices systematically influence consumers’ judgments of subsequent prices. Thus, it can be argued that the contextual factors such as prior prices encountered during previous purchase occasions or price levels encountered during current purchase occasion influence consumers’ use of past prices as a reference for evaluating a current price. However, previous research falls short of offering similar insights when consumers use expected future prices as a reference for judging a current price. Some research has suggested that the contextual factors such as the frequency of promotions or temporal consistency of promotions may influence consumers’ forward looking behavior (e.g. Krishna 1991; Lattin and Bucklin 1989; Mela, Jedidi, and Bowman 1998). However, further research is required to establish the contextual factors that may lead to consumers’ forward looking behavior in terms of using an expected future price as reference price.

Fourth, although existing literature acknowledges that consumers may use expected future prices as a reference to make current purchase decisions, research does not inform about the consequences when consumers’ future price expectations are either confirmed or disconfirmed. For example, consumers may postpone purchasing (advance buy) if they anticipate future prices to be lower (higher) than current prices. However, the actual future prices may not
change as per consumers’ expectations. Prior research suggests that consumers may experience negative emotions such as regret and disappointment if the actual future prices disconfirm their expectations (e.g. Cooke, Meyvis, and Schwartz 2001; Inman and Zeelenberg 2002). In contrast, the social psychology research suggests that consumers may experience positive emotions such as rejoice and satisfaction if the actual future prices confirm their price expectations (Roese and Olson 1993). Further, prior research also suggests that experiencing such emotions may influence consumers’ judgments of subsequent price stimuli (e.g. Inman, Dyer, and Jia 1997; Zeelenberg and Pieters 2007). However, existing research is yet to establish these relationships between the use of an expected future price as a reference for making purchase decisions and subsequent affective and cognitive consequences on confirmation/disconfirmation of the future price expectations.

Purpose of the Dissertation Research

Objectives

This dissertation research attempts to address the above research gaps in the extant literature. One of the objectives of this dissertation research is to enhance theoretical as well as managerial understanding with regard to the implications of dynamic pricing over time. Although dynamic pricing was originally conceptualized as a practice of strategically charging different prices across consumers as well as over time, research on implications of dynamic pricing over time is rare (Kannan and Kopalle 2001). Recent advances in information technology, extensive availability of information about individual consumer’s purchasing behaviors and highly sophisticated decision support tools for analyzing data have led to dynamic
pricing practices, mainly exercised on the Internet (Elmaghraby and Keskinocak 2003). Dynamic pricing was seen as beneficial for sellers to exercise price discrimination strategy across individual consumers and over time based on consumers’ purchasing characteristics. However, potential negative consequences of charging different prices across consumers came to fore due to consumer outrage over revelations that Amazon.com charged higher prices to its regular customers (Ramasastry 2005). Following the negative publicity of Amazon.com's dynamic pricing, research investigated positive and negative implications of such a pricing strategy across consumer segments (Jayaraman and Baker 2003; Garbarino and Lee 2003; Grewal, Hardesty, and Iyer 2004; Haws and Bearden 2006; Sahay 2007). However, as pointed out by Kannan and Kopalle (2001), research on dynamic pricing over time remains neglected. As consumers come to terms with dynamic pricing over time, their expectations about future prices would likely influence their perceptions of current prices, and subsequently their purchase decisions. One objective of this dissertation is to investigate the marketing actions that may influence consumers to form expectations about future prices, and use their expectations to judge current prices.

Another objective of this dissertation research is to explore the psychological factors that may differentiate consumers in terms of their use of an expected future price as reference price. As stated earlier, previous pricing research has suggested that, ceteris paribus, consumers are likely to be heterogeneous in terms of their propensity to use an expected future price as a reference for judging a current price (Jacobson and Obermiller 1990). Consumers differ in terms of their motivation to process price-related information, and these motivational differences are likely to influence consumers’ likelihood to use expected future prices as a reference. This dissertation research attempts to examine whether consumers’ motivation to process price information is a necessary or enabling factor for the use of expected future prices as a reference.
Research Contributions

Theoretically, this dissertation research attempts to contribute to the extant literature on behavioral pricing relative to reference prices. Prior research on reference prices has argued that consumers may use prices from their past experiences, prices in a current purchasing environment, or expected future prices as a reference for evaluating a focal price (e.g. Monroe 2003). Although several researchers have offered evidence to the use of the prices from past experiences or current purchasing environment as a reference, research on the use of expected future prices as a reference is rare. The current dissertation research contributes to the reference price literature by addressing this research gap related to consumers’ use of expected future prices for evaluating current prices. Specifically, this dissertation research attempts to identify the antecedents of consumers’ likelihood of using expected future prices as a reference. Several contextual factors such as the frequency and temporal consistency of price promotions and ascending/descending price trends are proposed to influence the use of expected future prices for judging current prices. Further, consumers’ motivation to process price information and their mode of acquisition of price information are proposed as the enabling psychological factors necessary for the contextual factors to influence the use of expected future prices as a reference.

This dissertation research also contributes to the existing literature on consumers’ forward looking behavior. Previous research on consumers’ forward looking behavior has largely used an approach based on modeling methodology to investigate the factors related to consumers’ forward looking behavior. As stated earlier, the methodological constraints associated with a modeling approach do not allow researchers to obtain direct evidence to the hypothesized mechanisms. Rather, prior modeling research based on cross-sectional data from
consumer scanner panels has had to assume the hypothesized causal mechanisms related to consumers’ forward looking behavior. The current dissertation research attempts to overcome this methodological limitation by examining consumers’ forward looking behavior using an approach based on controlled laboratory experiments. This research is proposed to complement, consolidate, and offer triangulating evidence to the previous findings based on the modeling methodology.

Managerially, this dissertation research contributes to the managerial understanding of consumers’ use of expected future prices as a reference for evaluating current prices. Specifically, this research attempts to enhance managerial understanding of consumer response to the frequent or temporally consistent price promotions and ascending/descending price trends. An understanding of consumers’ psychological characteristics associated with the forward looking behavior is also expected to help managers in segmenting consumers in terms of their propensity to use expected future prices as a reference. Further, this research also contributes to the understanding of likely consumer response to dynamic pricing over time. Specifically, this research examines the influence of dynamically changing prices on consumers’ purchase postponement and advance buying behaviors. Managers potentially can use this research to inform their pricing strategies and tactics to obtain a desired consumer response to the dynamic prices over time.

Overview of the Dissertation

Chapter 1 has provided a brief overview of the idea that consumers may look forward and use expected future prices to judge current prices and make purchase decisions. Chapter 1 also introduced the research problems investigated in the current dissertation research. Chapter 2
presents a literature review of prior research related to consumers’ forward looking behavior, reference prices, and consumers’ use of an expected future price as reference price. Chapter 2 also presents a conceptual framework and proposes testable hypotheses for understanding the psychological and contextual antecedents of the use of an expected future price as a reference. Chapter 3 presents a detailed discussion of the methodology that was used to experimentally test the hypotheses presented in chapter 2. Chapter 4 presents a detailed description of the statistical data analyses performed on the data collected from the three studies that were conducted to test the hypotheses. Chapter 5 presents a discussion of the results, theoretical and managerial contributions of the findings, and directions for future research. In the end, references from extant research are presented and are followed by appendices describing the experimental instructions for the three studies.
SUMMARY

This chapter introduced the research questions that the current dissertation research attempts to investigate. First, the chapter emphasized the theoretical and managerial importance of examining consumers’ use of expected future prices as a reference for judging current prices. Then, the chapter presented research gaps in the extant literature related to understanding consumers’ likelihood of using an expected future price as reference price. The chapter argued for a need to investigate the psychological and contextual factors that may influence consumers to use expected future prices as a reference. It was also suggested that the evidence obtained through modeling methodology based on scanner panel data is not sufficient to establish the causal mechanisms pertaining to consumers’ forward looking behavior. Then, the objectives of the current dissertation research were presented, followed by the proposed theoretical and managerial contributions. It was suggested that the current research attempts to contribute to the existing literatures on reference prices as well as consumers’ forward looking behavior. It was also suggested that the current research attempts to enhance managerial understanding of likely consumer response to dynamically changing prices over time. The next chapter presents a detailed literature review of previous research related to reference price. The next chapter also proposes a conceptual framework to identify the psychological and contextual factors that may influence consumers’ use of expected future prices as a reference.
This chapter is organized to fulfill the following objectives. First, this chapter introduces the idea that consumers may use an expected future price to judge the current price of a product or brand and consequently, make purchase decisions based on the price judgments. Then the chapter presents prior research about the influence of consumers' expected future price of a product on their price judgments and purchase decisions. Specifically, prior research related to reference prices, and the influence of consumers' expected future price on their brand choice, purchase timing, and purchase quantity decisions is reviewed and summarized. A research gap in extant literature relative to factors that may influence consumers to use an expected future price of a product as a reference price is identified. A conceptual framework to understand how factors may influence consumers to use an expected future price as a reference is developed to address this research gap. Specific testable hypotheses are developed based on the proposed conceptual framework.

FUTURE PRICE EXPECTATIONS

Consumers often form expectations about the future price of a product. In turn, these expectations about a future price may influence consumers’ judgments of the current price of a product, and subsequently their purchase decisions such as buy now or later, and if buying now, then how much to buy. For example, Holak, Lehmann, and Sultan (1987) found that consumers often form expectations about future prices in product categories such as personal computers and video cassette recorders. They found that consumers consciously forgo consumption and purposefully delay purchases of these products when they expect future prices of these products
to be lower than their current prices. Similarly, Greenleaf and Lehmann (1995) also found
evidence for the formation of expectations about future price when consumers consider relatively
expensive, high-involvement purchases. They found that consumers consider delaying the
purchases when they expect a product’s price to fall in the future.

The formation of expectations about future price of a product or brand is not restricted to
high-priced purchases only, though expensive consumer durables are generally more likely to be
postponed due to the typically discretionary nature of these types of products (Wood 2005).
Early research in behavioral economics provides corroborating evidence for the formation of
expectations about future prices in the categories of relatively less expensive, frequently
purchased packaged goods. In the context of an economic downturn, Katona (1974; 1975)
suggested that consumers often form expectations about future prices for typically non-
discretionary purchases too. Based on the data collected through consumer surveys, Katona
suggested that consumers try to optimize their expenditures by either postponing or advance-
buying items based on their expectations about future prices. Several other researchers have
suggested that the formation of expectations about future price is often central to consumers’
brand choice, purchase timing, and purchase quantity decisions for relatively high-priced,
infrequently purchased durables as well as relatively low-priced, frequently purchased packaged
goods (e.g. Jacobson and Obermiller 1990; Kalyanaram and Winer 1995; Gönül and Srinivasan
1996; Mela, Jedidi, and Bowman 1998; Macé and Neslin 2004). Although Monroe (1979) and
Winer (1985) had argued for the influence of consumers’ anticipated future prices on their
current consumption and/or purchase behavior, Jacobson and Obermiller (1990) were probably
the first to posit that consumers’ expected future price of a product could serve as a reference
price.
REFERENCE PRICES

The concept of reference price refers to the idea that consumers form price judgments by comparing or evaluating an observed price of a product or brand against some standard or reference (Monroe 1973). The theoretical bases for the reference price concept can be traced to the adaptation-level and assimilation-contrast theories (Hovland, Harvey, and Sherif 1957; Helson 1964). In short, adaptation-level theory suggests that people develop internal norms or adaptation levels as a function of their past and/or present exposure to or experiences with stimuli. The judgments of new or subsequent, similar stimuli are formed with respect to these internal norms or adaptation levels.

Following adaptation-level theory, Monroe (2003) suggested that consumers perceive stimuli as members of classes or categories and in turn, judge or evaluate the stimuli based on their adaptation level for that category. The concept of adaptation level or reference price essentially posits that consumers’ evaluations or judgments of a price stimulus are based on a comparison of the price stimulus with other price stimuli. Previous research has suggested that the comparative standard that consumers may use in forming price judgments is a function of the frequency distribution of prices in a category, the range of prices in a category, the past prices of a product, and/or the future expected prices of a product (e.g. Jacobson and Obermiller 1990; Krishnamurthi, Mazumdar, and Raj 1992; Briesch et al. 1997; Janiszewski and Lichtenstein 1999; Monroe 2003).

Similarly, assimilation-contrast theory also posits that individuals judge a new stimulus against their experiences with a category that is perceived as related to the new stimulus. The experiences that individuals might have had with a category serve as a reference that individuals use for evaluating the new stimulus. Following assimilation-contrast theory, Monroe (2003)
suggested that the reference that consumers use for forming price judgments is actually a range or band of prices rather than a single price point. Accordingly, an assimilation effect is said to occur when a new price is perceived as similar to the reference price range, whereas a contrast effect is said to occur when a new price is perceived to be significantly different than the reference price range.

Both adaptation-level and assimilation-contrast theories suggest that consumers’ previously held reference price range moves in the direction of a newly encountered price that serves as an anchor for evaluation of subsequent price stimuli related to the category (Nunes and Boatwright 2004). Consistent with the prediction of adaptation-level and assimilation-contrast theories, Della Bitta and Monroe (1974) reported that consumers’ price judgments are influenced by the sequence of prices that they are exposed to before making the judgment. Della Bitta and Monroe found that consumers’ perceptions of prices can be influenced by whether they are exposed to relatively higher or lower prices initially. In their study, participants who were initially exposed to relatively higher prices reported subsequent prices as less expensive, as compared to the consumers who were exposed to relatively lower prices initially. This finding supports the contention that the initial price stimuli influence consumers’ internal reference price, and that the subsequent price stimuli are judged with respect to this internal reference price.

Prior research based on modeling methodology has acknowledged the influence of reference prices on consumers’ purchase decisions as an empirical generalization (Kalyanaram and Winer 1995). Although considerable prior research offers empirical support for the existence of a reference price in formation of consumers’ price judgments, previous modeling research has differed in the conceptualization and in turn, operationalization of the reference price construct.
(Briesch et al. 1997). Although researchers seem to agree upon the existence of a reference in formation of price judgments, what this reference represents has not been agreed upon. The differences in conceptualization of the reference price construct have been broadly categorized based on whether consumers give more emphasis on either the temporal/past or the contextual/current price information when forming their reference to judge the current price. The temporal perspective, as discussed in previous modeling research, suggests that the reference price that contributes to consumers’ current price judgments is based on price information encountered by consumers on previous occasions. In contrast, the contextual perspective, as discussed in previous modeling research, suggests that the reference price is based on the prices encountered by consumers during the current purchase occasion (Rajendran and Tellis 1994). It should be noted that previous behavioral research has suggested a broader definition of the contextual perspective (e.g. Monroe 2003). Monroe (2003) has suggested that contextual information refers to all the information that is not directly related to the focal stimuli, but may still influence consumers’ judgments of the focal stimuli. For example, available monetary resources, purpose of purchase, and the information contained in a purchase environment are contextual cues that may influence consumers’ judgments of a product’s price.

Following a temporal-versus-contextual categorization, the majority of previous empirical research based on a modeling approach using scanner panel data for frequently purchased packaged goods has emphasized the temporal or past price information over current or contextual price information in formation of a reference price (e.g. Krishnamurthi, Mazumdar, and Raj 1992; Mayhew and Winer 1992; Kalyanaram and Little 1994; Briesch et al. 1997). In contrast, very little research based on the modeling approach has reported evidence supporting the influence of current, contextual price information on consumers’ reference prices (e.g.
Hardie, Johnson, and Fader 1993; Rajendran and Tellis 1994). However, previous research based on the behavioral perspective using experiments has reported extensive evidence supporting the influence of contextual factors on consumers’ reference price or standard that may be used for their price judgments (e.g. Della Bitta and Monroe 1974; Alba et al. 1999; Janiszewski and Lichtenstein 1999; Adaval and Monroe 2002; Nunes and Boatwright 2004; Krishna et al. 2006).

Other ways in which the conceptualizations of the reference price construct have been categorized are internal versus external reference prices, and memory-based versus stimulus-based reference prices (Briesch et al. 1997; Monroe 2003; Mazumdar, Raj, and Sinha 2005). Broadly stating, internal reference prices are construed as the internal standards that are formed as a result of consumers’ prior experience with the product or brand and the information contained in the current purchase environment. In contrast, external reference prices are conceptualized as the explicit comparative standards provided by sellers to influence consumers’ judgments of the current price of a brand. The external reference prices have also been discussed in conjunction with comparative price advertising (Monroe 2003). For example, a common marketing practice is to provide consumers with two prices at the point of display. Whereas one of the displayed prices represents the current selling price, the other comparative price is usually denoted using words such as “formerly”, “compare at”, or “regular”, or likewise. Sellers’ intentions seem to be to influence consumers’ judgments of the current price favorably by displaying a “regular” price that is higher than the currently selling price.

Reference prices have also been categorized as either memory-based or stimulus-based (Briesch et al. 1997). Parallel to the temporal versus contextual categorization, this categorization is loosely based on the difference in the degree to which consumers are assumed to use the information stored in their memory from previous exposure to price information versus
the information contained in the current purchase environment. Consumers’ price judgments are construed to be memory-based when previously encountered price-related and/or other information are retrieved from memory to judge the current price of a product or brand. In contrast, consumers’ price judgments are said to be stimulus-based when externally available information such as advertised prices or current prices of other brands in the purchase environment are used to judge the current price of a target brand. In the next sections, I briefly summarize the findings from prior reference price research.

**Contextual Influences on Reference Price**

*Modeling Research.* Hardie, Johnson, and Fader (1993) argued that the most recently purchased brand becomes the reference brand for consumers. If so, they suggested that the current price of this reference brand becomes the standard or reference that consumers use to form price judgments. This conceptualization suggests that although the previously encountered information may be relevant in formation of the reference *brand*, the currently available information in a purchase environment is likely to be more influential in formation of the reference *price*. They found that a theoretical model built using this assumption showed a good fit with their scanner panel data of refrigerated orange juice purchases. Rajendran and Tellis (1994) also suggested that consumers evaluate the current price of a brand by comparing it with the current prices of other brands on the shelf. Their argument is based on the proposition that most consumers learn price information about low-priced purchases incidentally (Monroe, Powell, and Choudhury 1986). Previous research has posited that consumers learn price information through either intentional or incidental learning (Mazumdar and Monroe 1990). It is argued that intentional learning would likely lead to the formation of price judgments through a
comparison between the current and previous prices of the same product or brand. In contrast, incidental learning would likely lead to the formation of price judgments through a comparison between the current prices of the brands on the shelf. Rajendran and Tellis found that a theoretical model that incorporated the currently available price information as a reference showed a significantly better fit with the scanner panel data of saltines, when compared to rival models that incorporated only the previously encountered price information as a reference.

Following the idea of previously encountered price information as a reference, Krishnamurthi, Mazumdar, and Raj (1992) operationalized reference price as the one-period lagged price for a brand. This operationalization is based on the assumption that the immediately preceding price is an unbiased estimate of all past prices if these past prices do not show a trend (Raman and Bass 1986). If a price trend is perceivable, then the last price paid need not necessarily represent all past prices. Rather, the last price paid will likely represent just a part of the perceived trend. Kalwani et al. (1990), in support of this operationalization, also reported that little difference exists between the fit statistics of a model using the last price paid for a brand as the reference and a rival model using the weighted log mean of the last five prices paid as the reference. The use of a weighted mean suggests that the authors assumed that the more recent prices have greater weight than the more distant prices in influencing consumers’ reference price. The use of a log mean instead of an arithmetic mean implies that the authors assumed that consumers will discount extremely high or low prices when forming a reference price.

In contrast to the findings reported by Rajendran and Tellis (1994), Krishnamurthi, Mazumdar, and Raj reported that the model based on the assumption of one-period lagged price as the reference showed better fit with scanner panel data on the ground caffeinated coffee category, when compared to a rival reference price model based on the comparison between the
current prices of other brands on the shelf. Mayhew and Winer (1992) suggested that consumers use multiple reference points in evaluating the price of a brand. They categorized the reference price construct into the internal and the external reference prices. The internal reference price was operationalized as the last price paid by the consumer in a product category. In contrast, the external reference price was operationalized as the price displayed as “regular” on the shelf tags. Mayhew and Winer reported significant support for the internal reference price operationalization that was based on the last price paid when they tested the model against the scanner panel data on yogurts. Similarly, Kalyanaram and Little (1994) also reported evidence in support of a reference price model that was based on the previous purchase prices, and was tested against the scanner panel data on sweetened and unsweetened drinks.

In order to comparatively evaluate the multiple conceptual and operational definitions of reference price used in previous research, Briesch et al. (1997) formulated five alternative reference price models. They distinguished the different conceptualizations of the reference price construct into stimulus-based and memory-based reference prices. The two stimulus-based reference price models were formulated based on the assumption that consumers may use either the current price of any brand in a category or the current price of a known brand as the reference. The three memory-based reference price models were based on the assumption that consumers may use either the historical prices of a brand, the historical promotional information of the brand, or the historical prices of all brands in a category as the reference to form price judgments. Briesch et al. tested these five reference price models using the scanner panel data on four frequently purchased product categories of peanut butter, liquid detergent, ground coffee, and tissues. They reported that the reference price is unique for each brand, and that the memory-based reference price model that assumes that consumers use the historical prices of a brand in
forming their reference prices fit the data better than the other four models. Briesch et al.’s finding suggests that the reference price formation is likely to be predominantly based on previously encountered information, and that consumers likely use the past prices of each brand in forming the reference price for that brand.

In summary, the research findings based on scanner panel data on frequently purchased packaged goods suggest that previous research is inconclusive over what the reference price construct represents. Although previous modeling research appears to agree on the existence of a standard or reference that consumers use in forming price judgments, researchers have differed on whether the past prices and promotional information of a brand influence its reference price more than the current prices and other contextual information such as currently ongoing promotions or vice versa. Majority of prior modeling research has reported evidence in support of the past prices in formation of the reference. Relatively less research has reported evidence in support of the current prices of other brands on the shelf in formation of the reference price for a focal brand. In contrast to previous modeling research, prior research based on the behavioral perspective primarily using experiments has offered extensive evidence supporting the influence of contextual factors in the current and past purchase environment on formation of consumers’ reference prices.

*Experimental Research.* As stated earlier, in an early study on the influence of contextual factors on consumers’ reference prices, Della Bitta and Monroe (1974) used adaptation-level theory to examine the reference effects of previously encountered price information on the current price judgments. They found that prior exposure to price stimuli can affect consumers’ judgments of subsequently presented prices. Janiszewski and Lichtenstein (1999) examined the
influence of contextual factors on consumers’ internal reference prices using Volkmann’s (1951) range theory. Based on range theory, Janiszewski and Lichtenstein argued that consumers use the range of remembered price experiences to set lower and upper bounds of price expectations. In turn, the relative location of a new price within this range influences consumers’ perceptions of its expensiveness. Using a series of four experiments, Janiszewski and Lichtenstein reported evidence that the range of prices that consumers evoke when evaluating a price influences their perceptions of the price. Specifically, when the upper bound of the range of prices was increased, participants in their experiment reported more favorable perceptions of a target price. In contrast, when the lower bound of the range of prices was decreased, participants reported less favorable price perceptions. Parallel evidence can be found in Biswas and Blair’s (1991) conclusion that consumers’ purchase intentions are sensitive to their perceptions of the lowest price and the highest price in the marketplace. Janiszewski and Lichtenstein’s finding suggests that consumers’ reference price is influenced by dual standards represented by the lowest and the highest endpoints of a range, rather than a single standard as implied by the concept of an adaptation level. However, it should be noted that adaptation-level theory also proposes a region of price insensitivity around the adaptation level, which is referred in previous research as the latitude of price acceptance (Monroe 1971; Kalyanaram and Little 1994).

Niedrich, Sharma, and Wedell (2001) extended Janiszewski and Lichtenstein’s findings by suggesting that not only a range of prices, but the frequency distribution of prices in a range also influences consumers’ reference prices. This argument is based on Parducci’s (1965) range-frequency theory. The range-frequency theory suggests that consumers’ judgments of a stimulus are influenced by its location within the distribution of contextual stimuli that are salient at the time of judgment. The range principle suggests that judgments are influenced by the endpoints or
the most extreme values defining the context, whereas the frequency principle suggests that judgments are influenced by the number of instances of category exemplars falling below and above the target stimulus. Based on a set of three experiments, Niedrich, Sharma, and Wedell reported that the range-frequency theory provided a better account of the cognitive representation of consumers’ reference prices, as compared to either the adaptation-level theory or the range theory alone. Further, their findings suggest that although the relative frequency of prices within a category influences consumers’ reference price of a product or brand in that category, the lowest and the highest prices that define the range have greater influence than the other prices that fall in that range.

Prior research has also discussed the influence of price discounting on consumers’ reference price for the price-discounted brand (e.g. Gupta 1988; Chintagunta 1993; Chiang 1995; Bucklin, Gupta, and Siddarth 1998; Bell, Chiang, and Padmanabhan 1999). Alba et al. (1994) reported that frequent, shallow discounts generally lead to perceptions of lower price levels, as compared to infrequent, deeper discounts. However, a contrasting possibility was shown by Alba et al.’s (1999) examination of the effect of discount depth on consumers’ reference prices. The depth effect on price judgments is based on adaptation-level theory (Monroe and Petroshius 1981). As discussed previously, adaptation-level theory predicts that when consumers encounter extreme prices, their adaptation level will move in the direction of these extreme values, and subsequently encountered prices will be judged with respect to this new adaptation level. Thus, adaptation level theory predicts that a deep price discount on a brand will move consumers’ reference price for that brand toward the discounted price, and subsequently encountered prices of the brand will be judged with respect to this new level of their reference price.

In contrast, the frequency effect on price judgments is based on the stimulus complexity
argument. Research by Pelham, Sumarta, and Myaskovsky (1994) suggested that consumers are likely to rely on the numerosity or frequency heuristic when processing of price information is difficult. Alba et al. (1999) found that the depth effect is more prominent than the frequency effect when regular and sale/discounted prices have a simple, dichotomous temporal distribution, whereas the frequency effect is more prominent than the depth effect when the prices exhibit a complex, non-dichotomous temporal distribution. Lalwani and Monroe (2005) extended Alba et al.’s findings by showing that the frequency and depth effects cannot be completely explained by the dichotomous and non-dichotomous nature of temporal price distributions and/or stimulus complexity argument. Lalwani and Monroe’s findings suggest that consumers’ price judgments are more influenced by the relative salience of the frequency of discounts versus the depth of discounts, and this influence of relative salience of the frequency versus depth is independent of the influence of the dichotomous or non-dichotomous nature of temporal price distributions.

Adaval and Monroe (2002), Nunes and Boatwright (2004), and Krishna et al. (2006) have provided further support for the influence of contextual factors on consumers’ reference prices. Adaval and Monroe reported that a high-priced context increases consumers’ reference price, whereas a low-priced context decreases it. They showed that a product was judged as less expensive in a high-priced context than in a low-priced context, even when consumers recalled the actual price of the product to be higher in the low-priced context than in the high-priced context. The authors also reported that the participants in their experiments were not consciously aware of this contextual influence on their price judgments. Similarly, Nunes and Boatwright (2004) showed that the prices that consumers encounter unintentionally have an anchoring effect on the price that consumers are willing to pay for a subsequently encountered product. The anchoring mechanism predicts that random starting points can systematically influence
consumers’ price judgments. Nunes and Boatwright also showed that consumers need not perceive the initial anchoring stimuli as relevant to the focal stimuli for the anchoring effect to take place. Further evidence of contextual factors on consumers’ price judgments is offered by Krishna et al. (2006) who reported that, in a catalog marketing context, consumers’ price judgments for a product are influenced by the presence of extreme priced products in the catalog. Krishna et al. argued that the extreme values have an anchoring effect of consumers’ judgments and in turn, influence their reservation price for a product as well as the product category.

Summary

As the above review of previous research indicates, the majority of modeling research has emphasized the importance of previously encountered price information on formation of consumers’ reference prices that they use for making price judgments. In contrast, experimental research has reported several factors in the current purchase environment that influence consumers’ reference prices. Modeling research has operationalized reference price predominantly as a brand-specific construct. Models constructed using the assumption that the past price information represents consumers’ reference price have been fit to scanner panel data on frequently purchased packaged goods, and compared with rival models using the relative degree of fit to test their validity. The reported findings generally provide support for the influence of past price information on the formation of consumers’ reference prices. However, direct evidence of this hypothesized mechanism is not available due to the methodological constraints. Rather than obtaining direct evidence, researchers using the modeling approach have had to assume that consumers use past price information as the reference since their models have been validated using cross-sectional data obtained from scanner panels. Raju and Hastak (1980)
have acknowledged this shortcoming of the research based on scanner panel data, and have called for further research based on a prior theoretical framework rather than basing conclusions only on empirical data analyses.

In contrast to modeling research, experimental research has offered more direct evidence for the influence of contextual factors on consumers’ reference prices. It has been shown that the perceived price levels in a purchase context influence consumers’ reference price for a target product. Specifically, consumers’ reference price for a product or brand was found to be higher when the prices of other products or brands in the purchase context were relatively high, as compared to when the prices of other products or brands were relatively low. Thus, the currently selling price of a target product or brand is perceived as less expensive when the product or brand is presented in a high-priced context, rather than in a low-priced context. It has also been shown that consumers themselves may not be aware of such contextual influence on their reference prices. Further, previous research has reported larger size of the effect of the contextual prices on judgments of a target product’s price when the contextual products or brands are perceived as related to the target product or brand. Prior experimental research has also reported that the highest and lowest prices in a category as well as the frequency distribution of prices within the range defined by the highest and the lowest prices influence consumers’ price judgments of a category member. The endpoints of the range and the modal price within that range have been shown to have significantly more influence than the other prices in that range on consumers’ reference prices for a product or brand in that category.

In summary, previous research provides extensive evidence supporting the influence of past prices of a brand as well as the current prices of other brands on consumers’ reference price for the brand. Although prior research acknowledges that consumers may expect future prices of
a product or brand to evaluate the current price, research has yet to identify specific factors or conditions when consumers would use an expected future price as a reference to form price judgments. Jacobson and Obermiller (1990) and Monroe (2003) have offered a conceptualization of consumers’ reference price in terms of their expected future price of a product or brand.

EXPECTED FUTURE PRICE AS A REFERENCE PRICE

Jacobson and Obermiller (1990) argued that consumers’ expectation of a future price of a product or brand influences their perception of the current price of the product or brand, and their decision of whether to buy now or later. This argument is based on the concept of inter-temporal utility maximization or inter-temporal consumption substitution from neoclassical economic theory. Broadly stating, this theory proposes that income-constrained individuals maximize their utility by anticipating their future consumption and the future prices of consumables. Accordingly, consumers are always expected to look forward and assess the costs and benefits of buying now versus buying in the future. The concept of inter-temporal utility maximization suggests that consumers always consider how much of a product should be purchased in period t and how much should be purchased in period t+1 or a subsequent time period. These inter-temporal utility maximizing consumers make this decision based on the current price and the expected future prices of the product. Information about the past prices or expectations of the current price matter only to the extent that they influence consumers’ expectations of the future prices. Thus, neoclassical economic theory suggests that an expected future price may be a function of past price information, current prices, as well as price trends. However, consumers’ price judgments and subsequent purchase decisions will necessarily be a function of a comparison between the current price and an expected future price (reference price).
Although Jacobson and Obermiller’s conjecture seems to have some merit, it appears too simplistic to assume that consumers’ price judgments are always the outcome of a comparison between the current price and an expected future price. Thaler (1985) has observed that consumers often do not behave in accordance with the normative prescriptions of economic theory. Following Thaler’s observation and previous research that emphasized the influence of past prices and other current, contextual prices on consumers’ reference prices, it may be argued that consumers use an expected future price of a product as a reference only under certain conditions. Although previous research by Winer (1985), Yoo, Dolan, and Rangan (1987), and Kalyanaram and Winer (1995) have supported the use of an expected future price as a reference, previous research has not identified the specific factors or conditions that would induce consumers to use an expected future price as a reference for forming price judgments.

**Motivation to Process Price Information**

Previous research suggests that consumers who are motivated to process price information are more likely to notice or be aware of changes in the price of a product as compared to consumers who are relatively less motivated to search and process price information. Research has also shown that consumers are heterogeneous in the way they learn, process, and retain information about, and search for prices in the marketplace (Ailawadi, Neslin, and Gedenk 2001; Babin, Gonzales, and Watts 2007; Mazumdar and Monroe 1990; Monroe and Lee 1999; Sinha and Batra 1999). Indeed, Jacobson and Obermiller (1990) have acknowledged that consumers may differ in the degree to which they perceive and use price information in their purchase decisions. Previous research has reported that consumers who are relatively price conscious are more concerned about searching for low prices, use store brands more frequently,
emphasize price relative to other aspects of the purchase, and are more motivated to process price information extensively (Ailawadi, Neslin, and Gedenk 2001; Alford and Biswas 2002; Kukar-Kinney, Walters, and MacKenzie 2007; Lichtenstein, Bloch, and Black 1988). Vanhuele and Drèze (2002) have suggested that consumers who search relatively more for price information than others would have better long-term memory about prices, are more likely to use price as a decision variable, and are more likely to compare prices across brands and stores as compared to consumers who search relatively less for the price information. Therefore,

H1: Consumers who are motivated to process price information are more likely to perceive the possibility that the future price of a product could be different than the current price, as compared to the consumers who are not motivated to process price information.

Consequently, these consumers are more likely to use an expected future price of a product as a reference for judging the current price, as compared to the consumers who are not motivated to process price information extensively.

Although it is hypothesized that consumers who are motivated to process price information are more likely to use an expected future price as a reference, it is an enabling but not a sufficient condition for when consumers would use an expected future price as a reference. Whether these motivated consumers will indeed use an expected future price as a reference will also depend on some environmental factors such as the frequency of price promotions, the temporal pattern of price promotions, and the general trend of prices in the product category.

*Frequency of Price Promotions*

Previous research indicates that the frequency with which a product has been price
promoted influences consumers’ reference price for the product, i.e., expected price to pay (Krishna 1991; Kalwani and Yim 1992). Specifically, *ceteris paribus*, the more frequently that a product has been price promoted the lower will be the consumers’ reference price for the product. Promotion frequency also influences consumers’ purchase behavior when the product is selling at a promoted versus a regular price (e.g., Krishna, Currim, and Shoemaker 1991; Krishna 1994; Lattin and Bucklin 1989; Mela, Jedidi, and Bowman 1998). It has also been suggested that if brands within a category are frequently price promoted, then consumers may screen out the non-promoted brands from their purchase consideration sets during the current shopping trip. Further, if a product is promoted frequently, then consumers may become conditioned to buy the product only when it is selling at a promoted price (Fader and McAlister 1990).

Previous research has suggested that when a product has been promoted frequently, consumers likely become accustomed to buying it at a promoted price (e.g., Kalwani et al. 1990; Kalwani and Yim 1992; Lattin and Bucklin 1989; Sun, Neslin, and Srinivasan 2003). Other research suggests that when exposed to frequent price promotions, consumers may adjust their purchase timing to coincide with the timing of the promotions (Gönül and Srinivasan 1996; Krishna 1992; Macé and Neslin 2004). Similarly, if a product is promoted frequently, then consumers may become reluctant to purchase it when a promoted price is not available (Kalwani and Yim 1992). This argument is consistent with Lattin and Bucklin’s (1989) conjecture that consumers may expect a price promotion every time when they frequently observe such promotions. Consequently, they are less likely to buy the product when it is not price promoted.

Krishna, Currim, and Shoemaker (1991) argued that consumers with relatively larger family sizes and/or lower incomes are (less) more motivated than others to purchase when a price promotion is (not) available. It should be noted that the authors did not actually measure
consumers’ motivation in their study; rather they assumed that the demographic characteristics such as family size and income correlate with consumers’ motivation to buy on promotion. The authors also reported that these consumers were relatively more accurate than other consumers in recalling the timing of the past promotions as well as predicting when a future promotion might occur. Further, their findings suggest that both the accuracy of recalling the timing of past promotions and predicting the timing of future promotions increases when the frequency with which a brand is price promoted increases. Finally, Krishna (1991) found that consumers who were informed about the timing of the future promotions tended to purchase fewer units of a product during a purchase occasion when it was selling at a regular price, as compared to consumers who were not informed about the timing of future promotions.

Taken together, these findings suggest that consumers’ ability to predict correctly when a product will sell at a promoted price increases when the frequency with which the product is promoted increases. Indeed, previous research has suggested that people are likely to recall a stimulus better if they are exposed to the stimulus frequently versus infrequently. Further, the accuracy of recalling a frequently encountered stimulus is positively related to the accuracy of predicting the next exposure to the stimulus (Kintsch 1970). Therefore,

H2a: If a frequently (infrequently) price promoted product is currently selling at its regular price, then ceteris paribus, consumers will be more (less) confident in their ability to predict when the next price promotion for the product will occur.

H2b: If consumers are (not) confident in their ability to predict when the next price promotion for a product will occur, then they will be (less) more likely to use their expected future price as a reference price.

H2c: If the expected future price is perceived to be less than the current selling price,
then consumers will be more likely to either:

(a) postpone their intended purchase of the product until the next purchase occasion, or

(b) acquire less than their usual purchase quantity of the product.

H2d: If consumers are not confident in their ability to predict when the next price promotion for a product will occur, then they will be less likely to postpone buying the product.

Previous research has also reported that the price that consumers expect to pay for a product or brand is higher when the frequency of promotions is low versus high (Alba et al. 1994; Alba et al. 1999; Lalwani and Monroe 2005). As stated earlier, this expectation is consistent with the prediction stemming from adaptation-level theory that consumers’ expected or reference price is likely to be closer to a regular or non-promotional price if consumers are exposed to the regular price more frequently than a promotional price (Monroe and Petroshius 1981). Similarly, Kalwani and Yim (1992) have suggested that if a price promotion occurs infrequently, then it would be unexpected to consumers when it does occur. Further, their findings suggest that consumers perceive a price promotion more attractive when it is unexpected than when it is expected. When a price promotion is not expected for a future purchase, consumers are likely to expect to pay a price that is closer to the regular price of a product. Thus, on the availability of a price promotion when it was unexpected, consumers are likely to perceive positive transaction value. That is, their (expected) reference price is higher than the actual selling price. In contrast, when a price promotion is expected, consumers are likely to expect to pay a price that is closer to a promoted price of a product. Thus, on availability of a price promotion when it was expected, the perceived transaction value is likely
to be less than the perceived transaction value when a price promotion is unexpected.

Perceived transaction value has been conceptualized as the perception of psychological satisfaction or pleasure obtained from taking advantage of the financial terms of a price deal (Grewal, Monroe, and Krishnan 1998; Lichtenstein, Netemeyer, and Burton 1990; Monroe and Chapman 1987; Thaler 1985). Previous research findings suggest that, ceteris paribus, perceived transaction value is positively related to consumers’ willingness to buy (Monroe and Chapman 1987; Zeithaml 1988), and negatively related to their intention to search for a product (Grewal, Monroe, and Krishnan 1998). It should be noted that, although consumers’ transaction value may often influence their acquisition value from a purchase, these two constructs are conceptually different. Perceived acquisition value has been conceptualized as the net of consumers’ perceptions of the benefits obtained from acquiring and using a product and their perceptions of monetary sacrifices required to acquire the product (Dodds, Monroe, and Grewal 1991; Lichtenstein and Bearden 1989). Grewal, Monroe, and Krishnan (1998) have suggested that buyers’ perceptions of transaction value are likely to be situation specific, whereas their perceptions of acquisition value are more holistic evaluations of a product’s value. Further, their findings suggest that perceived transaction value often influences perceived acquisition value, but a reverse relationship, that is acquisition value influencing transaction value, is not likely.

Taken together, it can be argued based on the above findings that consumers use the regular price as a reference for forming price judgments when the frequency of promotions is low, whereas they use a lower expected promoted price as a reference when the frequency of promotions is high. Thus, consumers’ perceptions of transaction value from a promoted price are likely to be higher when the promoted price is available infrequently versus frequently. Consequently, when consumers perceive a high transaction value due to availability of a
promoted price, they are likely to advance-buy or stockpile -buy more than their usual purchase quantity- the brand, provided that they perceive that the product is not perishable. Indeed, research has offered supporting evidence that consumers may tend to purchase larger quantities when a promotional price is available in an infrequently promoted product category as compared to a frequently promoted category (Blattberg, Eppen, and Lieberman 1981; Krishna 1994; Mela, Jedidi, and Bowman 1998).

In sum, these findings suggest that consumers are less likely to expect a price promotion when a product is promoted infrequently. When a price promotion does occur, consumers are likely to perceive a higher transaction value if the frequency with which a brand is promoted is low versus high. Further, when a promotional price becomes available, consumers tend to purchase larger quantities when the frequency with which a brand has been promoted is low versus high. Therefore, if a product is selling at a promoted price, the likelihood that consumers will expect the regular price to be the future price will be greater when the frequency with which the product has been promoted is low versus high.

H3a: If a product is promoted infrequently, then consumers’ perceptions of transaction value from a promoted price will be higher than when a product is promoted frequently.

H3b: If a product is selling at a promoted price, consumers are more likely to use their expected future price of the product as a reference for forming price judgments when the frequency with which the brand has been price promoted is low versus high.

H3c: If the expected future price for a non-perishable product is perceived to be higher than the current selling price, then consumers will be more likely to either:

(a) advance their intended purchase of the product, or
(b) stockpile the product, i.e. acquire more than their usual purchase quantity of the product

Temporal Pattern of Promotions

Previous research indicates that the pattern of price promotions over a period of time of a product could influence consumers’ purchases of the product (Krishna 1991; 1994). Krishna (1991) argued that consumers’ accuracy of remembering timing of past promotions as well as predicting timing of future promotions is likely to be higher when the pattern of promotions is regular or consistent over time in comparison to a random or irregular pattern. A regular or consistent pattern of promotions would indicate that a promoted price is available after every ‘n’ purchase occasions. In contrast, a random or irregular pattern of promotions would indicate that a promoted price is available randomly. It should be noted that Krishna’s (1991) argument does not refer to a consistency of the magnitude of discount offered by a price promotion; rather it refers to only a consistency of the time interval between any two consecutive price promotions. Research has suggested that people are likely to exhibit greater awareness of a stimulus when their exposure to the stimulus is temporally regular, rather than temporally random (Simon and Kotovsky 1963; Essens and Povel 1985). That is, when there is a consistent time interval between any two consecutive exposures to a stimulus, the accuracy with which individuals recognize the stimulus is greater than when time intervals between any two consecutive exposures are random.

Krishna’s (1991) findings suggest that the accuracy with which consumers can remember as well as predict the timing of promotions is the highest when promotions are frequent and consistent, as compared to either infrequent and consistent, or frequent and random. Further,
Krishna (1994) reported that when the promotions are spaced evenly rather than unevenly over time, consumers are not only able to accurately remember and predict the timing of promotions, but they are also likely to be more confident in their ability to predict timing of future promotions. Krishna (1994) also found that consumers’ confidence in predicting the timing of future promotions was higher when the pattern of promotions was consistent over time and spaced at equal time intervals as compared to spaced randomly.

Taken together, these findings suggest that if a product is selling at a regular or non-promoted price, then consumers are more likely to use an expected future price of the product as a reference when the pattern with which the product has been price promoted is consistent, rather than random. Further, the likelihood that consumers will use an expected future price of a product as a reference is greater if the pattern of price promotions has been consistent and the product has been promoted frequently versus infrequently.

H4a: If a product is selling at a regular price during the current purchase occasion, then consumers are more likely to use an expected future price of the product as a reference price when the pattern of price promotions is consistent versus random.

H4b: The likelihood that consumers will use an expected future price of a product as a reference will be higher when the pattern of price promotions is consistent and the frequency of price promotions is high, as compared to either:

(a) when the pattern of price promotions is random and the frequency of price promotions is high, or

(b) when the pattern of price promotions is consistent and the frequency of price promotions is low.
Price Trends

Previous research has reported that consumers may respond to price trends such as inflationary or deflationary variation in prices over time by either postponing or accelerating intended purchases (e.g. Katona 1974; Meyer and Assunção 1990). Research has argued that rational consumers consider the ascending or descending price trends to adjust the timing and quantity of their intended purchases (Blattberg, Eppen, and Lieberman 1981; Meyer and Assunção 1990). This argument is based on the normative models of inventory control, which assume that consumers seek to maximize long-term value of their purchases by planning their sequential purchase decisions over time. Similar to Jacobson and Obermiller (1990), this argument assumes that consumers consider future prices when making current purchase decisions such as buy now or later, or buy in advance (Koopmans 1960; Malinvaud 1972). The normative inventory control models prescribe that a rational consumer should postpone intended purchases as long as possible when faced with a descending price trend. In other words, consumers should try to maintain bare minimum inventory during each purchase cycle so as to minimize their expenditures over time and in turn, maximize their transaction value due to the lower future prices. In contrast, when faced with an inflationary or ascending price trend, rational consumers should try to maintain maximum possible inventory during every purchase cycle so as to minimize their expenditures over time and avoid potential loss of transaction value due to the higher future prices. However, previous behavioral research has reported findings that potentially imply that consumers’ purchase behaviors may not be in accordance with these predictions offered by the normative models of inventory control (Della Bitta and Monroe 1974; Meyer and Assunção 1990).

As stated earlier, Della Bitta and Monroe (1974) reported that the participants in their
experiment judged a price as less expensive when the price was preceded by a descending price series, as compared to when the price was preceded by an ascending price series. This finding is in accordance with the predictions of adaptation-level theory, which implies that consumers judge a price with respect to a reference that is a function of their past experiences with prices. When a price is shown as a part of a descending (ascending) series of prices, it is perceived as less (more) than the reference which is a function of previously shown prices that are higher (lower) than the current price. It should be noted that the participants in Della Bitta and Monroe’s experiments did not make purchase decisions in response to the ascending/descending price trends; rather they only reported their subjective price perceptions. However, as stated earlier, the concept of transaction value implies that consumers are likely to perceive a higher (lower) transaction value when they perceive a price as relatively less (more) expensive than the reference price. Therefore, it may be hypothesized that consumers are more (less) likely to purchase a product when its price is preceded by a descending (ascending) price series. Meyer and Assunção (1990) also reported that the participants in their experiment showed an increasing tendency to defer purchases when prices were increasing, and accelerating purchases when prices were decreasing. Similarly, Katona (1974) used data collected from a large scale survey by the Survey Research Center at the University of Michigan to conclude that consumers tend to increase their savings, and decrease expenditures when faced with inflationary trends though their real incomes may be increasing more that the prices.

Previous research based on the psychological theories of memory and learning may offer insights in potentially resolving these apparently conflicting accounts of consumers’ likely response to ascending or descending trends in prices. Research by Jacoby and Olson (1977), and Helgeson and Beatty (1987) suggests that the way consumers encode and retrieve information
about prices will likely depend on the nature of information processing undertaken when the
price information was first encountered. Mazumdar and Monroe (1990) argued that consumers
acquire information about prices either intentionally or incidentally. Based on a set of
experimental studies, they reported that the participants who acquired price information
intentionally were more accurate in recalling the prices, as compared to the participants who
acquired price information incidentally. In contrast, the participants who acquired the price
information incidentally were more accurate in ranking brands based on the prices, as compared
to the participants who acquired it intentionally. These findings suggest that consumers who
intentionally acquire price information are more likely to be able to accurately encode and
retrieve prices encountered during previous purchase occasions, as compared to the consumers
who incidentally acquire it. Consequently, it may be argued that the consumers who intentionally
acquire price information are more likely to perceive an ascending or a descending trend in
prices over time, as compared to the consumers who incidentally acquire price information.
Parallel to the intentional-incidental categorization based on the mode of acquisition of price
information, other research has suggested that consumers are heterogeneous in terms of their
knowledge of the prices available at a store (Estelami and De Maeyer 2004; Magi and Julander
2005). Ofir et al. (2008) distinguished the relatively more knowledgeable consumers from the
relatively less knowledgeable consumers based on the number of prices that consumers can
recall. Their findings suggest that the relatively more knowledgeable consumers are able to recall
more number of prices than the relatively less knowledgeable consumers. Taken together, these
findings suggest that the consumers who intentionally acquire price information are also likely to
be relatively more knowledgeable about the prices, as compared to the consumers who
incidentally acquire price information. Consequently, these intentional learners are more likely to

perceive an ascending or a descending trend in prices over time, as compared to the incidental learners. Therefore, when consumers are motivated by enhancing their transaction value from a purchase, the likelihood that they will use an expected future price as a reference in response to a trend in prices is greater when they intentionally (versus incidentally) acquire price information. In contrast, the consumers who incidentally acquire price information are more likely to use the recently encountered price as a reference, rather than a trend in prices.

H5a: If prices of a product exhibit an ascending or a descending trend over time, AND if consumers are motivated by enhancing their transaction value from purchasing the product, they are more likely to use an expected future price of the product as a reference when they acquire the price information intentionally versus incidentally.

H5b: If prices of a product exhibit an ascending (a descending) trend over time, consumers who intentionally acquire the price information are more likely to stockpile (postpone) their intended purchase of the product, as compared to the consumers who incidentally acquire the price information, provided that the consumers are motivated by enhancing their transaction value from purchasing the product.

H5c: Consumers who acquire the price information incidentally are more likely to use the recent price of the product as a reference (versus the trend in prices) if prices of a product exhibit an ascending or a descending trend over time.
SUMMARY

This chapter has presented a conceptual framework for understanding factors that may induce consumers to use an expected future price of a product as a reference for judging a current price, and consequently, make purchase decisions. The chapter first introduced the idea, and provided evidence that consumers often use their expectations about future prices to judge current prices, and consequently make purchase decisions based on these price judgments. Previous research related to the influence of consumers’ anticipated future prices on their current purchase decisions was reviewed and summarized. It was argued that an expected future price of a product serves as a reference price that consumers may use to compare the current price and form price judgments. Prior reference price research was reviewed to examine the extant literature for identification of the factors that may lead to the use of an expected future price of a product as a reference. Specifically, both behavioral and modeling streams of research on the influence of contextual factors on consumers’ reference prices were reviewed. A research gap relative to the psychological and contextual factors leading to the use of an expected future price as a reference price was identified in extant literature. To address this research gap, several contextual factors were identified as likely conditions leading to the use of an expected future price as a reference price.

Based on prior research on consumer response to price information, it was argued that consumers are heterogeneous in terms of their motivation to process price information, and the ways in which they attend to and acquire price information. Specifically, it is argued that some consumers are relatively more motivated than others to process price information extensively. These motivated consumers are also more likely to remember prices correctly, emphasize price relative to other aspects of a purchase decision, be aware of changes in the prices of a product,
and have better long-term memory about prices, as compared to other consumers. Thus, it was argued that the consumers who are motivated to process price information are more likely to perceive the possibility that the future price of a product could be different than the current price, and are also more likely to be motivated with enhancing their transaction value from a purchase. Consequently, these consumers are more likely to use an expected future price of a product as a reference for judging the current price, as compared to the consumers who are not motivated to process price information extensively.

Consumers are also heterogeneous in terms of the way in which they attend to, and acquire price information. Specifically, it was argued that some consumers learn about, or acquire price information intentionally, whereas other consumers acquire it incidentally. It was argued that the consumers who acquire price information intentionally are more likely to be aware of several prices from the past, as compared to the consumers who acquire price information incidentally. Thus, when prices of a product change in a temporally ascending or descending manner, the intentional learners are more likely to perceive a price trend as compared to the incidental learners. Consequently, when motivated by enhancing their transaction value, these consumers are more likely to respond to a price trend by judging the current price with respect to an expected future price. In contrast, it was argued that the incidental learners are more likely to use a recently encountered price to judge the current price because the incidental learners are less likely to perceive a price trend, as compared to the intentional learners.

Apart from these psychological factors related to the motivation of processing price information and mode of acquisition of price information, the chapter also argued for the frequency of price promotions, temporal consistency of price promotions, and general price trends as other contextual factors influencing consumers’ likely use of an expected future price.
as a reference price. It was argued that consumers who are motivated to enhance their transaction value from purchases are more likely to use an expected future price as a reference price when a frequently price-promoted product is selling at a regular price, or when an infrequently price-promoted product is selling at a promoted price. When a frequently (an infrequently) price-promoted product is selling at a regular (promoted) price, consumers motivated to process price information are likely to perceive a negative (positive) transaction value through a comparison between the current price and an expected promotional (regular) future price. Thus, it was argued that these consumers will either postpone (advance-buy) their purchase or purchase less (more) than their usual quantities when a frequently (an infrequently) price promoted product is selling at a regular (promoted) price.

It was also argued that consumers motivated to process price information are likely to use an expected future price of a product as a reference price when the price promotions of the product are temporally regular or consistent. For example, a product may be promoted after every “n” weeks, meaning that the time interval between any two consecutive price promotions will be consistent or equally spaced. It was argued that the confidence that the motivated consumers will perceive in predicting timing of the next price promotion will be higher when the price promotions are consistently spaced, rather than randomly or irregularly. Thus, when a consistently (versus randomly) price promoted product is selling at a regular price, the motivated consumers are more (less) likely to use an expected promotional future price as a reference price for judging the current price. As stated above, this chapter also discussed ascending/descending price trends as a contextual factor influencing consumers’ use of an expected future price as a reference price, provided that consumers acquire price information intentionally.

In conclusion, the conceptual framework presented in this chapter discussed consumers’
motivation to process price information, their mode of acquisition of price information, frequency of price promotions, temporal pattern of price promotions, and general ascending/descending price trends as the psychological and contextual factors influencing the use of an expected future price as a reference price. In the next chapter, the three experiments used to test the conceptual framework presented in this chapter are described.
Chapter 3

RESEARCH METHODS

This chapter presents research designs and methodology used to test the hypotheses presented in Chapter 2. Three experiments were conducted to test the research hypotheses. An experiment allows researchers to implement standardized procedures, and control the influence of non-experimental factors to some extent. By randomly assigning the treatment and the control conditions across respondents, a researcher can minimize the undesired effects of the factors such as selection bias and other extraneous non-experimental factors, thereby enhancing validity of the existence or absence of relationships between the theoretical constructs of interest.

The three experiments allowed for systematic manipulation of the factors that are hypothesized to influence consumers’ use of an expected future price of a product as a reference price to form price judgments, and consequently make purchase decisions. This chapter presents the research design, the dependent and independent variables, operationalizations for all relevant variables, and detailed descriptions of the experimental procedures.

STUDY DESIGNS

The three experiments were designed to test the influence of frequency of price promotions (study 1), temporal pattern of price promotions (study 2), and price trends (study 3) on consumers’ use of an expected future price of a product as reference price.

Study 1

Study 1 examined the influence of the motivation to process price information and the frequency of price promotions on consumers’ use of an expected future price as reference price, testing hypotheses H1, H2a, H2b, H2c, H2d, H3a, H3b, and H3c. Following previous research (Krishna 1991; Krishna 1994), a 3 (frequency of price promotions: low, medium, high) x 2
(motivation to process information: high, low) between-subjects design was used. As indicated in chapter two, consumers’ motivation to process price information is argued to be an enabling or necessary condition for consumers’ use of an expected future price as reference price. Therefore, motivation to process price information was manipulated at two levels, high and low, across the three levels of price promotion frequency.

*Independent and Dependent Variables.* The independent variables in this study were (1) frequency of price promotions and (2) motivation to process price information. The frequency of price promotions was manipulated as high, medium or low using pretested frequencies of price promotions (once every three/five/seven weeks).

The dependent variables in this study were (1) perceived confidence in predicting timing of the next price promotion, (2) use of an expected future price as reference price, (3) perceived transaction value, and (4) intended purchase quantities.

*Study 2*

Study 2 examined the influence of temporal pattern of price promotions on consumers’ use of an expected future price as reference price, testing hypotheses H4a and H4b. A 2 (temporal pattern of price promotions: consistent versus random) x 2 (frequency of price promotions: high versus low) between subjects design was used for study 2. Motivation to process price information was manipulated to be high across all experimental conditions.

*Independent and Dependent Variables.* The independent variables in this study were (1) temporal pattern of price promotions, (2) frequency of price promotions, and (3) motivation to process price information. The temporal pattern of price promotions was manipulated as consistent (equal time interval between any two consecutive price promotions) or random (random time interval between any two consecutive price promotions). The frequency of price
promotions was manipulated as high or low using pretested frequencies of price promotions (once every three or seven weeks).

The dependent variable in this study was the use of an expected future price as reference price.

**Study 3**

Study 3 investigated the influence of price trends on consumers’ use of an expected future price as reference price, testing hypotheses H5a, H5b, and H5c. A 2 (acquisition mode: intentional versus incidental) x 3 (price trend: ascending, descending, or no trend) between subjects design was used for study 3.

**Independent and Dependent Variables.** The independent variables in this study were (1) mode of acquisition of price information, (2) price trends, (3) perceived transaction value and (4) motivation to process price information. The mode of acquisition of price information was manipulated as either intentional or incidental. The price trends were manipulated as ascending, descending, or no trend. Perceived transaction value was measured and motivation to process price information was manipulated to be at a high level.

The dependent variables in this study were the use of an expected future price as reference price and purchase quantities.

**Pretests**

The objective of the pretests was to select levels of the frequency of price promotions in order to effectively manipulate respondents’ perceptions of the frequency as high, medium, or low. Pretests were also required for choosing temporal patterns of the price promotions such that the respondents will perceive a temporal pattern as either consistent or random. Further, the price trend variable needed to be pretested to make sure that the respondents perceived a price trend as
ascending, descending, or no trend.

*Frequency of Price Promotions.* Following previous research (Krishna 1991; Krishna 1994), participants’ perceptions of the frequency of price promotions are likely to be influenced by promoting a brand every three, five, or seven purchase occasions. For example, a brand that is price-promoted once every three purchase occasions is likely to be perceived as a frequently promoted brand, whereas a brand that is price-promoted once every seven weeks is more likely to be perceived as an infrequently promoted brand. Following previous research (Büyükkurt 1986; Jacobson and Obermiller 1990; Krishna 1991; Kalwani and Yim 1992), product categories such as soft drinks, canned tuna, pasta, frozen pizza, and laundry detergent are likely to be relevant to the college students.

Participants were asked to imagine that they shop at a hypothetical local grocery store for their weekly grocery and other miscellaneous purchases. Then, they were asked to observe the advertising flyers that this grocery store publishes weekly. The respondents were shown the advertising flyers for 21 consecutive weeks. The advertising flyers showed a hypothetical brand of canned tuna that was price promoted once every three, five, and seven weeks. A price promoted brand will be highlighted using a scratched regular price and an advertised current selling price (e.g. $1.79, $1.29). After observing the advertising flyers for 21 weeks, the respondents were asked to rate their perceptions of the frequency with which the featured product of canned tuna was price promoted. A 10-point scale anchored with (1-Very infrequently) and (10-Very frequently) was used to capture respondents’ ratings.

*Temporal Pattern of Price Promotions.* For a given frequency, respondents’ perceptions of the consistency of the price promotions are likely to be influenced by the temporal distribution of promotions over a range of purchase occasions (Krishna 1991). For example, if a product is
price promoted once every three weeks such that a price promotion occurs during the second, fifth, eighth, eleventh, fourteenth, seventeenth, and twentieth weeks, then the respondents are more likely to perceive it as a consistently price promoted product, as compared to other situations in which the time interval between any two consecutive price promotions is random or inconsistent.

Similar to the scenario presented above, respondents were informed about a hypothetical grocery store, and the weekly advertising flyers. Consistency of the price promotions was manipulated for all three levels of frequency of the price promotions (once every three/five/seven weeks). When the frequency of price promotions was once every three weeks, the price promotions will be shown during the weeks numbered three, six, nine, 12, 15, 18, and 21. When the frequency of price promotions was once every five weeks, the price promotions will be shown during the weeks numbered one, six, 11, and 18. When the frequency of price promotions was once every seven weeks, the price promotions were shown during the weeks numbered seven, 14, and 21. For generating randomness of time intervals between two consecutive price promotions while keeping the frequency of price promotions the same as above, random numbers were generated using RANDBETWEEN () function available in Microsoft Excel. By specifying an upper and lower range, the RANDBETWEEN () function generates a number between the range randomly. For example, when the frequency was once every three weeks, the RANDBETWEEN () function was provided with seven different ranges (0-4, 3-7, 6-10, 9-13, 12-16, 15-19, and 18-22) to generate seven numbers corresponding the weeks when promotions were shown. After observing the advertising flyers for 21 consecutive weeks, the respondents were asked to report their perceptions of temporal consistency with which the featured product of canned tuna was price promoted. An 11-point scale (5-0-5) anchored with (5-Very consistently)
and (5-Very inconsistently) was used to capture respondents’ subjective ratings.

*Price Trends.* Similar to the scenario presented above, respondents were informed about a hypothetical grocery store, and the weekly advertising flyers. For manipulating ascending or descending price trends, respondents were shown prices that either increased or decreased every other week by 5% as compared to the previous price level. Previous research has suggested that managers believe a 15% difference in price is perceived by consumers (Della Bitta and Monroe 1980). In contrast, a difference less than that may not be noticed, or a difference that is significantly larger than 15% may be considered exceptional. Della Bitta and Monroe (1980) have also reported that consumers’ perceptions of price difference between 30%, 40%, and 50% are not significantly different. Similarly, Uhl and Brown (1971) have also reported that consumers identified 15% deviations in prices correctly 84% of the time. In contrast, when the deviations were 5%, consumers identified them correctly only 64% of the time. This research used 5% deviations because the participants in both intentional as well as incidental learning condition were likely to perceive a 15% deviation. As was described in chapter 2, the ability to perceive ascending or descending price trends was hypothesized as a function of the mode of acquisition of price information. By selecting a 15% deviation, it would have been difficult to obtain such an effect. Instead, by selecting only a 5% deviation, there was more likelihood that the intentional learners would perceive it, whereas the incidental learners would not. In a control condition, no trends were shown to the respondents. RANDBETWEEN () function was used to generate prices for the “no trend” condition. After observing the advertising flyers for 10 consecutive weeks, the respondents were asked to report their perceptions of the trend in prices of canned tuna that was shown with ascending trend, descending trend, and no trend.
EXPERIMENTAL PROCEDURES

Sample Description

The respondents for the experimental studies were recruited from undergraduate students enrolled in the introductory courses in business administration, namely BADM 310 and BADM 320. In compensation of their voluntary participation in the experiment, the respondents were offered two extra credit points that they could apply toward their coursework in either BADM 310 or BADM 320. A sample that contains respondents from college student population only offers a relative homogeneity as compared to choosing a sample from general population. Homogeneous samples are considered superior than heterogeneous samples in terms of decreasing potential error variance due to heterogeneity and theoretically irrelevant characteristics of consumers (Calder, Phillips, and Tybout 1981). Consequently, homogeneous samples are more likely than heterogeneous samples to allow standard statistical procedures to identify significant relationships between the theoretical constructs. In contrast, a heterogeneous sample may obscure an existing relationship between the focal constructs, and may contribute to the type II error (Cook and Campbell 1975). Thus, a homogeneous sample is likely to offer a stronger test of the theory, as compared to a heterogeneous sample.

Other theoretically irrelevant but practically relevant factors also justify the use of a sample from the student respondents. First, recruiting a student sample is more convenient than recruiting a sample from general population. Second, the easy availability and extra-credit incentives make recruiting a student sample time and cost effective compared to a sample from general population. Further, college students are also consumers in real world.
Study 1

The objective of study 1 was to examine the influence of the motivation to process price information and the frequency of price promotions on consumers’ use of an expected future price as reference price. Respondents were presented with a hypothetical shopping scenario similar to the one described in the pretests. They were asked to imagine that they shop at a hypothetical local grocery store for their weekly grocery and other miscellaneous purchases. Then, they were informed that they would be provided with weekly product and price information for the product category of canned tuna. In response to the information provided, they were asked to make weekly purchase decisions by taking into account their weekly consumption of each product category. The respondents were provided with hypothetical numbers representing their typical weekly consumption units for each category. The respondents were asked to imagine that they use four units of canned tuna every week. Therefore, they had to make sure that at least a corresponding number of units of canned tuna are in their inventory for any given week. Further, the respondents were informed that they could not purchase more than eight units of canned tuna during any one week because of the budget constraints. At the beginning of the experiment, the participants started with zero units of canned tuna in their inventory.

Following Suri and Monroe (2003), motivation to process price information was manipulated by instructing the participants to pay attention to the possibilities to maximize the value they would obtain from their purchases. The participants were told that their name would be entered in a lottery to win a $50 gift card if their ratio of the number of products purchased and the total price paid over the experimental session was the best among all participants in their experimental session.

Starting with week 1, the respondents were shown the regular price and if available, a
promotional price for each product category for 21 consecutive weeks, and were asked to decide the number of units of each product they would purchase for each week. Based on prices of the above products in real marketplace, the regular price for 5-ounce canned tuna was used as $1.89. The promotional price for the same product was used as $1.39. Consistent with previous research (Della Bitta and Monroe 1980; Uhl and Brown 1971), the difference between promotional and regular price was slightly more than 15% of the regular price. The number of units of each product that respondents purchased was tracked for every week, and was used as a measure to determine the likelihood that respondents either postponed or accelerated purchasing during a week. Manipulation checks were performed to check respondents’ perceptions of the frequency with which canned tuna was promoted during the experiment. Finally, retrospective self-reports were sought to measure the likelihood that the respondents used an expected future price as reference price when a promoted or a regular price was available. Also, the respondents were asked to report the confidence they perceived in predicting the timing of the next promotion when a regular price was available.

Study 2

The objective of study 2 was to examine the influence of temporal pattern of price promotions on consumers’ use of an expected future price as reference price.

Similar to study 1, the frequency of price promotions was manipulated as high and low using the pretested frequencies (once every three/five weeks). The temporal pattern of price promotions was manipulated as described in the pretests. For example, when the frequency of price promotions was once every three weeks, the price promotions were shown during the weeks numbered two, five, eight, eleven, fourteen, seventeen, and twenty for the consistent pattern of price promotions. When the temporal pattern of price promotions was random and the
frequency was once every three weeks, the RANDBETWEEN () function in Microsoft Excel was used with seven different ranges (0-4, 3-7, 6-10, 9-13, 12-16, 15-19, and 18-22) to generate seven numbers corresponding to the weeks when promotions were shown. The dependent variables in this study were consumers’ use of an expected future price as reference and their purchase quantity for every week. Motivation to process price information was manipulated as described in the description of study 1.

Similar to study 1, respondents were presented with a hypothetical shopping scenario as described in the pretests. They were asked to imagine that they shop at a hypothetical local grocery store for their weekly grocery and other miscellaneous purchases. Then, they were informed that they would be provided with weekly product and price information for the product category of canned tuna. In response to the information provided, they were asked to make weekly purchase decisions by taking into account their weekly consumption of canned tuna. The respondents were provided with hypothetical numbers representing their typical weekly consumption units for the product category. The respondents were asked to imagine that they use four units of canned tuna every week. Therefore, they had to make sure that at least a corresponding number of units of canned tuna were in their inventory for any given week. Further, the respondents were informed that they could not purchase more than eight units of canned tuna during any one week because of the budget constraints. At the beginning of the experiment, the respondents started with zero units of canned tuna in their inventory.

One group of respondents was shown a temporally consistent pattern of price promotions, whereas another group of respondents was shown a random pattern of price promotions. For the consistent pattern of promotions, the same procedure as described for study 1 was used in this study. For the random pattern of promotions, the weeks when canned tuna was promoted were
chosen as described in the pretests. The number of units of canned tuna that the respondents purchased was tracked for every week, and was used as a measure to determine the likelihood that respondents either postponed or accelerated purchasing during a week. Finally, retrospective self-reports were obtained to measure the likelihood that the respondents used an expected future price as reference price when a promoted or a regular price was available.

Study 3

The objective of study 3 was to examine the influence of price trends and the mode of acquisition of price information on consumers’ use of an expected future price as reference price.

Ascending or descending price trends were manipulated by showing the respondents prices that either increased or decreased every other week by 5% as compared to the previous price level. The prices for the “no trend” condition were generated by using RANDBETWEEN () function where the endpoints of the range were separated by only 5% from each other. In other words, all prices generated by the RANDBETWEEN () function fell between a range defined by 5% difference between the endpoints. Following Mazumdar and Monroe (1990), intentional mode of acquisition of price information was manipulated by explicitly instructing one half of the respondents to try to remember the prices when they would make their purchase decisions. These intentional learners were told that remembering the prices was important for making the best purchase decisions during subsequent purchase occasions. In contrast, in the incidental learning condition, the respondents were not alerted to pay attention to the price information. Instead, they were told to make their purchase decisions as quickly as possible. Motivation to process price information was manipulated in the same fashion as suggested in study 1 and 2.

Similar to study 1 and 2, respondents were presented with a hypothetical shopping scenario. They were asked to imagine that they shop at a hypothetical local grocery store for
their weekly grocery and other miscellaneous purchases. Then, they were informed that they would be provided with weekly product and price information for product category of canned tuna. In response to the information provided, they were asked to make weekly purchase decisions by taking into account their weekly consumption of canned tuna. The respondents were provided with hypothetical numbers representing their typical weekly consumption units for canned tuna. The respondents were asked to imagine that they use four units of canned tuna every week. Therefore, they had to make sure that at least corresponding number of units of canned tuna was in their inventory for any given week. Further, the respondents were informed that they could not purchase more than eight units of canned tuna during any one week because of the budget constraints. At the beginning of the experiment, the respondents started with zero units of each product in their inventory. The number of units of canned tuna that respondents purchased was tracked for each week, and was used as a measure to determine the likelihood that respondents either postponed or accelerated purchasing during a week. Finally, retrospective self-reports were sought to measure the likelihood that the respondents used an expected future price as reference price when a promoted or a regular price was available.
SUMMARY

This chapter presented a detailed overview of the three experiments that were conducted to test the conceptual framework described in chapter 2. The first experiment was conducted to test the influence of the frequency of price promotions and the motivation to process price information on consumers’ use of an expected future price as a reference. The second experiment was conducted to test the influence of temporal consistency of price promotions on the use of an expected future price as a reference. The third experiment was conducted to test the influence on ascending/descending price trends on the use of an expected future price as a reference. This chapter also described the pretests used for choosing stimuli for the three experiments. Specifically, pretests were conducted for selecting three levels (high, medium, low) of the frequency of price promotions, two levels (consistent, random) of temporal consistency of price promotions, and three levels (ascending, descending, no trend) of price trends.

This chapter also described the experimental procedures in detail. The participants were subjected to hypothetical weekly purchase decisions in the product category of canned tuna. Canned tuna was selected based on previous research. The frequency of price promotions was manipulated as once every three, five or seven weeks. The temporal consistency of price promotions was manipulated by offering price promotions after every ‘n’ weeks or during a randomly selected week. The price trends were manipulated by either increasing or decreasing prices every week by 5%. This chapter also described procedures for manipulating consumers’ motivation to process price information (high versus low) and their mode of acquisition of price information (intentional versus incidental).
Chapter 4

ANALYSES AND RESULTS

This chapter presents results of the three studies that were conducted to test the hypotheses proposed in Chapter 2. For each study, first the results of preliminary reliability analyses are presented for the experimental measures used in the study. Then results of the manipulation checks and the tests of the hypotheses are presented. Tables and charts supporting the reported results are presented at the end of this chapter. A summary of the tests of all hypotheses is presented in a single table at the end of the chapter (Table 4.7).

Study 1

Study 1 was conducted to examine the influence of the motivation to process price information and the frequency of price promotions on consumers’ use of an expected future price as a reference. A 2 (motivation: low, high) X 3 (frequency of promotions: low, medium, high) between-subjects design was used for testing hypotheses H1, H2a, H2b, H2c, H2d, H3a, H3b, and H3c. One hundred and fifty six undergraduate students enrolled in introductory business courses BA310/BA320 in the College of Business at University of Illinois at Urbana-Champaign participated in study 1 for extra course credits.

Reliability

Factor analyses to test whether all items of a scale of a dependent variable load on a single factor confirmed single factor loading for all dependent measures. The scales used for measuring the dependent variables and the inter-item correlations for the scale items are presented in table 4.1.

The inter-item correlations suggest that, except for the scale measuring the use of
expected future price as a reference in presence of a regular/non-promotional price (EFP regular), the other scales resulted in acceptable values of inter-item correlations for the two items measuring the construct. The low correlation for the two items measuring EFP regular suggests that the two items likely do not measure the same underlying construct. Following Bergkvist and Rossiter (2007), it was determined that a single item (EFP regular1) may be used to measure EFP regular instead of the two items. Bergkvist and Rossiter (2007) have reported that there is no difference in the predictive validity of the multiple-item and single-item measures if a single-item measure is used to measure a construct that consists of a concrete object (Bergkvist and Rossiter 2007). When the object of a construct is considered concrete, it means that the object is easily and uniformly imagined.

**Manipulation Checks**

A manipulation check was performed to confirm that participants’ perceptions of the frequency of promotions were consistent with the actual frequency of promotions. After participants completed responding to the dependent measures, their perceived frequency of promotions was measured using the following single-item scale: In your opinion, how frequently did the store offer price promotion on canned tuna? (1-10 scale: 1 - Very Infrequently; 10 - Very Frequently)

A univariate ANOVA with actual frequency of promotions as the independent variable and the perceived frequency of promotions as the dependent variable confirmed that the manipulation of frequency of promotions was successful ($F(2,153) = 13.17, p < .00$). On a scale of 1-10 representing participants’ perceptions of frequency of promotions, the mean values of perceived frequency of promotions corresponding to the actual frequency of price promotions...
were $\text{FREQ}_{\text{low}} = 4.28$, $\text{FREQ}_{\text{medium}} = 5.56$, and $\text{FREQ}_{\text{high}} = 6.98$ (figure 4.1). Pairwise contrasts revealed that the differences between all pairs of perceived frequency were significant (low-medium: $p < .016$; medium-high: $p < .007$; high-low: $p < .00$).

Since the motivation to process price information was manipulated in the same way as suggested by Suri and Monroe (2003), a manipulation check was not performed for this variable.

*Hypotheses Tests*

Hypothesis H1 proposed that the motivation to process price information is positively related to the use of expected future price as a reference. Let motivation to process price information be referred to as motivation. The use of expected future price as a reference operationally was divided into two measurements. Specifically, the two measurements corresponded to whether the construct was measured in relation to a period when a regular/non-promotional price was available versus a period when a promotional price was available. In other words, it was tested whether the motivation to process price information was positively related to the use of expected future price as a reference in a period corresponding to a regular (promotional) price. Let the use of expected future price as a reference when regular (promotional) price was available is referred to as EFP regular (EFP promotional). A univariate ANOVA with EFP regular as the dependent variable and motivation as the independent variable was not statistically significant ($F(1,153) = .25$, $p < .62$, $\eta = .04$). On a scale of 1-10 representing participants’ reported use of the expected future price as a reference, the mean values of EFP regular corresponding to low versus high motivation were $\text{EFP}_{\text{regular}}_{\text{low}} = 7.03$ and $\text{EFP}_{\text{regular}}_{\text{high}} = 7.27$ (figure 4.2). Furthermore, an ANOVA with EFP regular as the dependent variable, and the frequency and motivation as the independent variables suggested the interaction
effect of the independent variables on EFP regular was significant \( F(2,139) = 3.80, p < .03, \eta = .16 \). The means for the six conditions corresponding to the interaction of frequency and motivation are shown in figure 4.23.

A univariate ANOVA with EFP promotional as the dependent variable and motivation as the independent variable was also not statistically significant \( F(1,155) = 1.42, p < .24, \eta = .10 \). On a scale of 1-10 representing participants’ reported use of the expected future price as a reference, the mean values of EFP promotional corresponding to low versus high motivation were in the opposite direction, as compared to the predicted direction in H1 (EFP promotional\text{low} = 9.25, EFP promotional\text{high} = 8.84; figure 4.2). Furthermore, an ANOVA with EFP promotional as the dependent variable, and the frequency and motivation as the independent variables suggested the interaction effect of the independent variables on EFP promotional was not significant \( F(2,139) = .16, p < .85, \eta = .03 \). The means for the six conditions corresponding to the interaction of frequency and motivation are shown in figure 4.24. These results suggest that H1 was not confirmed. Further, in the case of the use of expected future price as a reference during a promotional period, the results were in the opposite direction, as compared to the predicted direction in H1. It appears that the motivation to process price information as manipulated experimentally, may be negatively related to the use of expected future price as a reference as measured experimentally during a promotional period.

H2a predicted that when a regular price is available, the confidence in predicting a future price promotion is positively related to the frequency of price promotions. A univariate ANOVA with the reported confidence as the dependent variable and the frequency as the independent variable confirmed H2a \( F(2,130) = 24.64, p < .00, \eta = .52 \). The mean values of reported confidence corresponding to the three frequency conditions were \( \text{CONF}_{\text{low}} = 4.25, \text{CONF}_{\text{medium}} = \)
4.83, and $\text{CONF}_{\text{high}} = 7.58$ (figure 4.3). A polynomial contrast analysis revealed both a significant linear ($F(1,129) = 42.91, p < .00, \eta = .50$) and a significant quadratic trend ($F(1,129) = 6.34, p < .01, \eta = .22$) across the three levels of frequency. Therefore, the predicted positive relationship between the frequency of promotions and the perceived confidence in predicting a future promotion was confirmed. Furthermore, an ANOVA with the reported confidence as the dependent variable, and the frequency and motivation as the independent variables suggested an interaction effect of the independent variables on the reported confidence ($F(2,129) = 3.15, p < .05, \eta = .15$). The means for the six conditions corresponding to the interaction of frequency and motivation are shown in figure 4.18.

H2b predicted that the perceived confidence in predicting a future promotion is positively related to the use of expected future price as a reference. Since the independent variable perceived confidence was a continuous variable (measured on a 1-10 scale as presented in table 4.1), a regression was used instead of ANOVA for testing the effect of perceived confidence on the use of expected future price as a reference. A simple linear regression with EFP regular as the dependent variable and perceived confidence as the independent variable indicated that the hypothesized effect of perceived confidence on EFP regular was statistically significant ($R^2 = .04(1,130), p < 0.02$). The coefficient/slope of the regression line was positive ($\beta = 0.21$) which confirmed the hypothesized positive relationship between perceived confidence and the use of expected future price as a reference. An ANOVA table obtained from regression analysis confirmed the statistical significance of the effect ($F(1,130) = 5.27, p < 0.02$) Thus, the hypothesized effect predicted in H2b was confirmed.

H2c predicted that the likelihood of postponing purchases or purchasing less than the usual number of units is higher when future price is perceived to be lower than the current price.
For testing H2c, the dependent variable (hereafter referred to as NonPromotion Units) was computed by averaging the number of units of canned tuna bought by the participants during all periods when a regular price was available. The participants had to maintain a minimum inventory of four units of canned tuna between any two consecutive purchase occasions and they could not have bought more than eight units during any purchase occasion. Therefore, if they bought less than four units during a purchase occasion, they had to purchase more than four units during one of the subsequent purchase occasions. Thus, it may be argued that, when participants bought less than four units during a purchase occasion, they were in fact putting off some of the purchases to one of the subsequent purchase occasions. That is, they were postponing purchases to a future purchase occasion instead of the current occasion. Therefore, NonPromotion Units was used as a proxy measure of the likelihood of consumers’ postponement of purchases to a future purchase occasion. Based on the confirmation of H2a, the frequency of promotions was used as the independent variable because the frequency of promotions was positively related to the confidence in predicting a future promotion, that is, the perception of a lower future price than the current price. A univariate ANOVA with NonPromotion Units as the dependent variable and the frequency of promotions as the independent variable confirmed that the frequency of promotions had a statistically significant negative effect on the average number of units bought during a period when regular price was available \( (F(2,130) = 103.27, p < .00, \eta = .78) \). The mean values for the average number of units bought during a regular/non-promotional period corresponding to the three conditions of frequency were NonPromotion Units\textsubscript{low} = 3.79, NonPromotion Units\textsubscript{medium} = 3.23, and NonPromotion Units\textsubscript{high} = 2.64 (figure 4.4). All pairwise contrasts between the three conditions (low-medium, medium-high, and high-low) of the frequency of promotions were statistically significant at \( p < .00 \). The contrast analysis also
suggested a significant linear trend across the three conditions of frequency ($F(1,129) = 201.08, p < .00, \eta = .78$). Taken together, these findings suggest that participants in the condition of high frequency of promotions bought significantly fewer units during a regular/non-promotional period as compared to participants in the condition of medium frequency of promotions, who in turn bought significantly less number of units as compared to participants in the condition of low frequency of promotions. Thus, the hypothesized effect in H2c was confirmed. Furthermore, an ANOVA with NonPromotion Units as the dependent variable, and the frequency and motivation as the independent variables suggested the interaction effect of the independent variables on the average number of units bought during a regular/non-promotional period was not significant ($F(2,129) = 1.59, p < .21, \eta = .11$). The means for the six conditions corresponding to the interaction of frequency and motivation are shown in figure 4.19.

H2d predicted that the perceived confidence in predicting a future promotion is positively related to the likelihood of postponing the purchases. Following the tests of H2c, NonPromotion Units was used as the dependent variable. Since the independent variable (perceived confidence) is a continuous variable (measured on a 1-10 scale as presented in table 4.1), regression analysis was used instead of ANOVA, to test the hypothesized positive relationship between perceived confidence and the likelihood of postponement. A simple linear regression with NonPromotion Units as the dependent variable and the perceived confidence as the independent variable indicated that the hypothesized effect of perceived confidence on NonPromotion Units was statistically significant ($R^2 = .15(1,130), p < .00$). The coefficient/slope of the regression line was negative ($\beta = - .08$) which indicated that, if participants perceived higher confidence in predicting a future promotion, they bought fewer units during a regular/non-promotional period. An ANOVA table obtained from regression analysis confirmed the statistical significance of the
effect \(F(1,130) = 22.09, p < .00, \eta = .38\). Thus, the hypothesized effect predicted in H2d was confirmed.

H3a predicted that the perception of transaction value from a promoted price (hereafter termed as TransValuePromotion) is negatively related to the frequency of promotions. A univariate ANOVA with TransValuePromotion as the dependent variable and the frequency of promotions as the independent variable did not result in a statistically significant effect of the frequency on TransValuePromotion \(F(2,139) = 1.86, p < .16, \eta = .16\). The mean values of the reported transaction value from a promoted price corresponding to the three conditions of frequency were in the opposite direction, as compared to the predicted direction in H3a (TransValuePromotion\text{low} = 7.46, TransValuePromotion\text{medium} = 8.02, TransValuePromotion\text{high} = 8.32; figure 4.5). The results of contrast analysis suggested a linear trend \(F(1,139) = 3.60, p < .06, \eta = .16\). Taken together, these findings suggest that the hypothesized effect in H3a was not supported. Further, the direction of the effects was in the opposite direction, as compared to the hypothesized effects in H3a. Furthermore, an ANOVA with TransValuePromotion as the dependent variable, and the frequency and motivation as the independent variables suggested the interaction effect of the independent variables on the perception of transaction value from a promoted price was not significant \(F(2,139) = .06, p < .95, \eta = .02\). The means for the six conditions corresponding to the interaction of frequency and motivation are shown in figure 4.20.

H3b predicted that the use of expected future price as a reference is negatively related to the frequency of promotions, during a period when a promotional price is available. A univariate ANOVA with EFP promotional as the dependent variable and the frequency of promotions as the independent variable was not statistically significant \(F(2,129) = 1.46, p < .24\). The mean values
of EFP promotional corresponding to the three conditions of frequency were \( EFP_{\text{promotional}_{low}} = 8.62 \), \( EFP_{\text{promotional}_{medium}} = 9.12 \), and \( EFP_{\text{promotional}_{high}} = 9.37 \) (figure 4.6). None of the pairwise contrasts were statistically significant (low-medium: \( p < .26 \), medium-high: \( p < .57 \), and high-low: \( p < .10 \)). It should be noted that although the direction of the effect was in the opposite direction as predicted in H3b, contrast analysis did not show a significant linear trend \( (F(1,129) = 2.81, p < .10, \eta = .15) \). Thus, the hypothesized effect in H3b was not supported. Furthermore, an ANOVA with EFP Promotional as the dependent variable, and the frequency and motivation as the independent variables suggested the interaction effect of the independent variables on the perception of transaction value from a promoted price was not significant \( (F(2,129) = .16, p < .85, \eta = .04) \). The means for the six conditions corresponding to the interaction of frequency and motivation are shown in figure 4.21.

H3c predicted that the likelihood of accelerating purchases or purchasing more than usual number of units is higher when future price is perceived to be higher than the current price. Although perceived future price was not measured during a week in order to avoid accidentally priming participants to use the expected future price as a reference, the frequency of promotions could serve as a proxy for the likelihood of perceiving a higher price in the future as compared to the current price. The frequency of promotions was positively related to perceived confidence in predicting a future promotion, and in turn, to the use of expected future price as a reference. Thus, it may be argued that the likelihood of perceiving a higher price in future as compared to the current price is also positively related to the frequency of promotions. The dependent variable (hereafter termed as Promotion Units) was computed by averaging the number of units of canned tuna bought by the participants during all periods when a promotional price was available. The participants were told that typical consumption between any two consecutive
purchase occasions was four units of canned tuna. Therefore, if they bought more than four units during a purchase occasion, the additional units had to be consumed during one of the subsequent purchase occasions. Thus, it may be argued that, when participants bought more than four units during a purchase occasion, they were in fact advancing some of the purchases from one of the subsequent purchase occasions. That is, they were accelerating purchases from a future purchase occasion to the current occasion. Therefore, Promotion Units was used as a proxy measure of the likelihood of consumers’ acceleration of purchases from a future purchase occasion. Following H2a and H2c, the frequency of promotions was used as the independent variable because the frequency was positively related to the perceived confidence in predicting a future promotion, which implies the perceived confidence in predicting a higher future price following a promotional period.

A univariate ANOVA with Promotion Units as the dependent variable and the frequency of promotions as the independent variable confirmed that the frequency of promotions had a statistically significant positive effect on the average number of units bought during a period when promotional price was available ($F(2,129) = 5.19, p < .007, \eta = .27$). The mean values for the average number of units bought during a promotional period corresponding to the three conditions of frequency were Promotion Units$_{\text{low}}$ = 6.84, Promotion Units$_{\text{medium}}$ = 7.18, and Promotion Units$_{\text{high}}$ = 7.48 (figure 4.7). Contrast analysis suggested a significant linear trend across the three conditions of frequency ($F(1,129) = 10.37, p < .002, \eta = .27$). Thus, as hypothesized in H3c, the positive relationship between the frequency of promotions and the likelihood of accelerating purchases during a promotional period was confirmed. Furthermore, an ANOVA with Promotion Units as the dependent variable, and the frequency and motivation as the independent variables suggested the interaction effect of the independent variables on the
average units bought during a promotional period was not significant \(F(2,129) = .75, p < .48, \eta^2 = .08\). The means for the six conditions corresponding to the interaction of frequency and motivation are shown in figure 4.22.

Study 2

Study 2 was conducted to examine the influence of temporal pattern of price promotions on consumers’ use of an expected future price as reference price. A 2 (temporal pattern of price promotions: consistent versus random) x 2 (frequency of price promotions: high versus low) between subjects design was used for testing hypotheses H4a and H4b. Motivation to process price information was manipulated to be high across all experimental conditions. Seventy two undergraduate students enrolled in introductory business courses BA310/BA320 in the College of Business at University of Illinois at Urbana-Champaign participated in study 2 for extra course credits.

Reliability

Results of factor analyses that were conducted to test whether all items of a scale representing a dependent measure load on a single factor confirmed single factor loading for all dependent measures. The scales used for measuring the dependent variables and the inter-item correlations for the scale items are presented in table 4.2.

Following study 1 and Bergkvist and Rossiter (2007), it was determined that a single item EFP regular1 (EFP promotional1) may be used to measure EFP regular (EFP promotional) instead of the two items. It may be argued that the chosen single items are sufficiently concrete to represent the underlying constructs of purchase postponement and purchase acceleration.
When a single-item measure is used to measure a construct that consists of a concrete object, there may not be a difference in the predictive validity of an alternative multiple-item and the single-item measure (Bergkvist and Rossiter 2007).

**Hypotheses Tests**

Hypothesis H4a predicted that a consistent (versus random) pattern of promotions is more likely to lead to the use of expected future price as a reference during a period when regular/non-promotional (EFP regular) price is available. A univariate ANOVA with EFP regular as the dependent variable and the pattern of promotions as the independent variable suggested an effect of the pattern of promotions on EFP regular \((F(1,71) = 25.83, p < .09, \eta = .52)\). The mean values of EFP regular corresponding to the consistent/random pattern of promotions were EFP regular\(_{\text{consistent}} = 6.85\) and EFP regular\(_{\text{random}} = 8.05\) (figure 4.8). These mean values suggest that the direction of the effect of the pattern of promotions on the use of expected future price as a reference was opposite, as compared to the predicted direction of the effect in H4a. Therefore, based on these findings, H4a cannot be supported.

H4b predicted that the use of expected future price as a reference is higher when the pattern of price promotions is consistent and the frequency of price promotions is high (hereafter termed as Consistent High), as compared to either when the pattern of price promotions is random and the frequency of price promotions is high (hereafter termed as Random High), or when the pattern of price promotions is consistent and the frequency of price promotions is low (hereafter termed as Consistent Low). Following the procedure that was used for testing H1, the use of expected future price as a reference was operationally divided into two measurements. Specifically, the two measurements were corresponding to whether the construct was measured
in relation to a period when regular/non-promotional price was available (EFP Regular) versus a period when promotional price was available (EFP Promotional). A univariate ANOVA with EFP Regular as the dependent variable, and the pattern of promotions and the frequency of promotions as the independent variables suggested an interaction effect of the two independent variables on EFP Regular ($F(3,71) = 3.45, p < .06, \eta = .22$). The mean values of EFP Regular corresponding to the experimental conditions were EFP Regular_{ConsistentHigh} = 8.00, EFP Regular_{RandomHigh} = 7.84, EFP Regular_{ConsistentLow} = 5.83 (figure 4.9). Pairwise contrasts indicated that the difference between EFP Regular_{ConsistentHigh} and EFP Regular_{RandomHigh} was not statistically significant ($p < .88$). However, the difference between EFP Regular_{ConsistentHigh} and EFP Regular_{ConsistentLow} was statistically significant ($p < .03$). Although not central to the stated hypotheses, it should be noted that the reported use of expected future price as a reference was the highest for the condition of Random Low (EFP Regular_{RandomLow} = 8.26). Further, the difference between EFP Regular_{RandomLow} and Regular_{ConsistentLow} was statistically significant ($p < .015$).

A univariate ANOVA with EFP Promotional as the dependent variable, and the pattern of promotions and the frequency of promotions as the independent variables indicated that the interaction effect of the two independent variables on EFP Promotional was not statistically significant ($F(3,71) = .34, p < .56, \eta = .07$). The mean values of EFP Promotional corresponding to the experimental conditions were EFP Promotional_{ConsistentHigh} = 8.13, EFP Promotional_{RandomHigh} = 8.63, EFP Promotional_{ConsistentLow} = 7.33 (figure 4.10). A pairwise contrast indicated that the difference between EFP Promotional_{ConsistentHigh} and EFP Promotional_{RandomHigh} was not statistically significant ($p < .63$). The difference between EFP Promotional_{ConsistentHigh} and EFP Promotional_{ConsistentLow} was also not statistically significant ($p <
Although not central to the stated hypotheses, it should be noted that the reported use of expected future price was the highest for the Random Low condition (EFP Promotional\_RandomLow = 8.68).

Taken together, these results suggest that H4b cannot be confirmed.

Study 3

Study 3 was conducted to examine the influence of the mode of acquisition of price information and the price trends on consumers’ use of an expected future price as a reference. A 2 (acquisition mode: intentional, incidental) X 3 (price trends: ascending, descending, no trend) between-subjects design was used for testing hypotheses H5a, H5b, and H5c. One hundred and thirty one undergraduate students enrolled in introductory business courses BA310/BA320 in the College of Business at University of Illinois at Urbana-Champaign participated in study 3 for extra course credits.

Reliability

The dependent variable - the use of expected future price as a reference - was measured in relation to either purchase postponement in response to descending price trend or purchase acceleration in response to ascending price trend. It was expected that if participants perceived descending (ascending) price trend, and used an expected future price in response to the price trend, it would reflect in their attempt to postpone (accelerate) purchases to take advantage of lower (higher) future price. Let the use of expected future price as a reference in relation to purchase postponement (acceleration) is termed as EFP Postpone (EFP Accelerate). Results of factor analyses conducted to test whether all items of a scale representing a dependent measure load on a single factor confirmed single factor loading for all dependent measures. The scales
used for measuring the dependent variables and the inter-item correlations for the scale items are presented in table 4.3. Following studies 1 and 2, it was determined that a single item EFP Postpone1 (EFP Accelerate1) may be used to measure EFP Postpone (EFP Accelerate) instead of the two items. The chosen single items are sufficiently concrete to represent the underlying constructs of purchase postponement and purchase acceleration. Bergkvist and Rossiter (2007) have reported that when a single-item measure is used to measure a construct that consists of a concrete object, there may not be a difference in the predictive validity of an alternative multiple-item and the single-item measure.

Manipulation Checks

Manipulation checks were performed to confirm that participants’ perceptions of the price trends were consistent with the actual price trends. After participants completed responding to the dependent measures, their perceptions of price trend were measured using the following single-item scales: “Please let us know the degree to which you agree with the following statement. In general, the weekly prices of canned tuna showed an ascending (descending) trend (prices were increasing (decreasing) over time) (1-10 scale: 1- Not Agree At All; 10- Completely Agree).” Participants’ perception of “no price trend” was measured using the following single-item scale: “Please let us know the degree to which you agree with the following statement. In general, the weekly prices of canned tuna did not show an ascending or a descending trend (prices were increasing or decreasing randomly) (1-10 scale: 1- Not Agree At All; 10- Completely Agree).”

A univariate ANOVA with actual price trend as the independent variable and perception of ascending price trend as the dependent variable confirmed that the manipulation of ascending
price trend was successful \((F(2,130) = 196.49, p < .00, \eta = .78)\). On a scale of 1-10 representing participants’ perceptions of ascending price trend, the mean values of perceived ascending trend corresponding to the actual ascending, descending, and “no trend” conditions of price trend were \(\text{ASCENDINGTREND}_{\text{ascending}} = 9.29\), \(\text{ASCENDINGTREND}_{\text{descending}} = 1.74\), and \(\text{ASCENDINGTREND}_{\text{notrend}} = 2.92\) (figure 4.11). Pairwise contrasts revealed that the differences between the pairs of ascending-descending \((p < .00)\) and ascending-no trend \((p < .00)\) were significant.

A univariate ANOVA with actual price trend as the independent variable and perception of descending price trend as the dependent variable confirmed that the manipulation of descending price trend was successful \((F(2,130) = 181.36, p < .00, \eta = .76)\). On a scale of 1-10 representing participants’ perceptions of descending price trend, the mean values of perceived descending trend corresponding to the actual ascending, descending, and “no trend” conditions of price trend were \(\text{DESCENDINGTREND}_{\text{ascending}} = 1.88\), \(\text{DESCENDINGTREND}_{\text{descending}} = 9.10\), and \(\text{DESCENDINGTREND}_{\text{notrend}} = 2.74\) (figure 4.12). Pairwise contrasts revealed that the differences between the pairs of descending-ascending \((p < .00)\) and descending-no trend \((p < .00)\) were significant.

A univariate ANOVA with actual price trend as the independent variable and perception of no price trend as the dependent variable confirmed that the manipulation of no price trend was successful \((F(2,130) = 149.40, p < .00, \eta = .73)\). On a scale of 1-10 representing participants’ perceptions of no price trend, the mean values of perceived no trend corresponding to the actual ascending, descending, and no conditions of price trend were \(\text{NOTREND}_{\text{ascending}} = 2.10\), \(\text{NOTREND}_{\text{descending}} = 1.50\), and \(\text{NOTREND}_{\text{notrend}} = 8.10\) (figure 4.13). Pairwise contrasts revealed that the differences between the pairs of no trend-ascending \((p < .00)\) and no trend-
descending ($p < .00$) were also significant.

**Hypotheses Tests**

H5a hypothesized that the likelihood that consumers will use an expected future price as a reference in response to an ascending or a descending price trend will be higher when the mode of acquisition of price information is intentional, as compared to incidental. Following the procedure used for testing H1 and H4a, the use of expected future price as a reference operationally was divided into two measurements. The two measurements corresponded to whether the construct was measured in relation to either the hypothesized purchase postponement (EFP Postpone) in response to a decreasing price trend or the hypothesized purchase acceleration (EFP Acceleration) in response to an increasing price trend. For examining the use of expected future price as a reference in response to descending price trend, the cases corresponding to participants who were shown ascending price trend were excluded. A univariate ANOVA with EFP Postpone as the dependent variable, and price trend and mode of acquisition as the independent variables indicated that the interaction effect of the independent variables on EFP Postpone was not statistically significant ($F(1,88) = .86, p < .36, \eta = .10$). The mean values of EFP Postpone corresponding to the experimental conditions are presented in table 4.4 and figure 4.14.

For examining the use of expected future price as a reference in response to ascending price trend, the cases corresponding to participants who were shown descending price trend were excluded. A univariate ANOVA with EFP Accelerate as the dependent variable, and price trend and mode of acquisition as the independent variables indicated that the interaction effect of the independent variables on EFP Accelerate was not statistically significant ($F(1,80) = .00, p < .97,$
\( \eta = .00 \). However, the main effect of the trend on the use of expected future price as a reference was statistically significant \((F(1,80) = 4.30, p < .04, \eta = .23)\). Interestingly, the direction of the effect was opposite to that implied by the hypothesis. Participants in the no trend condition reported higher tendency to accelerate purchases as compared to the participants in ascending trend condition. The mean values of EFP Accelerate corresponding to the experimental conditions are presented in table 4.5 and figure 4.15. Taken together, the above results suggest that H5a cannot be supported.

H5b predicted that when motivated with enhancing their transaction value from purchasing the product, the participants primed with the intentional mode of acquisition (versus incidental) were more likely to postpone (accelerate) purchases in response to a decreasing (an increasing) price trend. Following the tests of H2c and H2d, the dependent variable was computed by averaging the number of units of canned tuna bought by the participants during all periods. The participants had to maintain a minimum inventory of four units of canned tuna between any two consecutive purchase occasions and they could not have bought more than eight units during any purchase occasion. Therefore, if they bought less (more) than four units during a purchase occasion, they had to purchase more (less) than four units during one of the subsequent purchase occasions. Thus, it may be argued that, when participants bought less (more) than four units during a purchase occasion, they were in fact putting off (advancing) some of the purchases to (from) one of the subsequent purchase occasions. That is, they were postponing (accelerating) purchases to a future (the current) purchase occasion instead of the current (a future) occasion. Participants could also have purchased minimum (maximum) possible units during every occasion if they were expecting prices to keep decreasing (increasing) during every subsequent period. In any case, as hypothesized in H5b, the average
units (referred to as AverageUnits) purchased by participants primed with intentional (versus incidental) mode should be relatively lower (higher) if they were postponing/buying minimum (accelerating/buying maximum) in response to the descending (ascending) price trend.

A univariate ANOVA with AverageUnits as the dependent variable, and price trend and mode of acquisition as the independent variables indicated that the effect of the independent variables on AverageUnits was not statistically significant ($F(2,124) = .88, p < .41, \eta = .08$). However, the main effect of price trend on AverageUnits was statistically significant ($F(2,124) = 3.46, p < .04, \eta = .16$). Interestingly, the direction of the effect was opposite to that implied by the hypothesis. Participants in the descending trend condition purchased significantly more units as compared to the participants in either the ascending or the no trend condition. The mean values of AverageUnits corresponding to the experimental conditions are presented in table 4.6 and figure 4.16. These results suggest that H5b cannot be supported.

H5c predicted that when consumers acquire price information incidentally, they are more likely to use the recent price (versus the trend in prices) of the product as a reference in response to an ascending or a descending price trend. For a descending (an ascending) price trend, a recent price would be higher (lower) than the current price, and thus, if the recent price is used as a reference, then the current price may be judged as relatively less expensive (more expensive). When motivated with enhancing their transaction value from purchasing the product, such a price judgment should result in purchasing relatively more (less) number of units as compared to when the current price is judged as relatively more expensive (less expensive). Therefore, if the recent price is used as a reference, then a participant should purchase relatively more (less) number of units in response to a descending (an ascending) trend in prices.

To test H5c, first the data were filtered to select the cases corresponding to participants
primed with the incidental mode of acquisition and either the descending or ascending price trend. Following the test of H5b, AverageUnits was used as the dependent variable to compare the average units bought by incidentally primed participants in response to the descending (versus ascending) price trend. Then, a univariate ANOVA was performed using AverageUnits as the dependent variable and price trend as the independent variable. The ANOVA results indicate that the effect of price trend on the average quantities purchased was statistically significant ($F(1,42) = 5.14, p < .03, \eta = .33$). The mean values for the average units purchased corresponding to the price trend conditions were $\text{AverageUnits}_{\text{ascending}} = 4.15$; $\text{AverageUnits}_{\text{descending}} = 4.65$ (figure 4.17). Given that the participants purchased significantly fewer average number of units in response to the ascending (versus descending) price trend, the results confirm H5c.
Table 4.1. Scales and Measures for the Dependent Variables in Study 1

<table>
<thead>
<tr>
<th>Measures</th>
<th>Items</th>
<th>Inter-item Correlations</th>
</tr>
</thead>
</table>
| The use of expected future price as a reference during a period when a regular/non-promotional price is available (EFP regular) (1-10 scale: 1- Not At All; 10- Very Much) | 1> When canned tuna was selling at its regular price (i.e. when it was not price promoted), I tried to postpone purchasing it. (EFP regular1)  
2> When canned tuna was selling at its regular price (i.e. when it was not price promoted), I tried to purchase less number of units as compared to the number of units required for typical weekly consumption. (EFP regular2) | .262 ($p < .000$)       |
| The use of expected future price as a reference during a period when a promotional price is available (EFP promotional) (1-10 scale: 1- Not At All; 10- Very Much) | 1> When canned tuna was price promoted, I tried to purchase it in advance. (EFP promotional1)  
2> When canned tuna was price promoted, I tried to purchase more number of units as compared to the number of units required for typical weekly consumption. (EFP promotional2) | .805 ($p < .000$)       |
| Perceived confidence in predicting a future promotion during a period when a regular/non-promotional price is available (postpone confidence) (1-10 scale: 1- Not Confident At All; 10-Very Confident) | 1> If you postponed purchasing canned tuna during a week in anticipation of a price promotion, how confident were you that a price promotion will be available soon? (postpone confidence1)  
2> During a week, if you purchased less number of units of canned tuna as compared to the number of units required for typical weekly consumption, how confident were you that a price promotion will be available soon? (postpone confidence2) | .851 ($p < .000$)       |
| Perceived confidence in predicting a future promotion during a period when a promotional price is available (accelerate confidence) (1-10 scale: 1- Not Confident At All; 10-Very Confident) | 1> If you purchased canned tuna in advance during a week when it was price promoted, how confident were you that a price promotion will not be available soon? (accelerate confidence1)  
2> During a week, if you purchased more number of units of canned tuna as compared to the number of units required for typical weekly consumption, how confident were you that a price promotion will not be available soon? (accelerate confidence2) | .630 ($p < .000$)       |
### Table 4.2. Scales and Measures for the Dependent Variables in Study 2

<table>
<thead>
<tr>
<th>Measures</th>
<th>Items</th>
<th>Inter-item Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>The use of expected future price as a reference during a period when a regular/non-promotional price is available (EFP regular) (1-10 scale: 1- Not At All; 10- Very Much)</td>
<td>1&gt; When canned tuna was selling at its regular price (i.e. when it was not price promoted), I tried to postpone purchasing it. (EFP regular1)</td>
<td>.427 ( p &lt; .000 )</td>
</tr>
<tr>
<td></td>
<td>2&gt; When canned tuna was selling at its regular price (i.e. when it was not price promoted), I tried to purchase less number of units as compared to the number of units required for typical weekly consumption. (EFP regular2)</td>
<td></td>
</tr>
<tr>
<td>The use of expected future price as a reference during a period when a promotional price is available (EFP promotional) (1-10 scale: 1- Not At All; 10- Very Much)</td>
<td>1&gt; When canned tuna was price promoted, I tried to purchase it in advance. (EFP promotional1)</td>
<td>.684 ( p &lt; .000 )</td>
</tr>
<tr>
<td></td>
<td>2&gt; When canned tuna was price promoted, I tried to purchase more number of units as compared to the number of units required for typical weekly consumption. (EFP promotional2)</td>
<td></td>
</tr>
</tbody>
</table>

### Table 4.3. Scales and Measures for the Dependent Variables in Study 3

<table>
<thead>
<tr>
<th>Measures</th>
<th>Items</th>
<th>Inter-item Correlations</th>
</tr>
</thead>
<tbody>
<tr>
<td>The use of expected future price as a reference during a period when the future price is expected to be lower than the current price (EFP Postpone) (1-10 scale: 1- Strongly Disagree; 10- Strongly Agree)</td>
<td>1&gt; In general, I tried to postpone purchasing canned tuna every week. (EFP Postpone1)</td>
<td>.286 ( p &lt; .000 )</td>
</tr>
<tr>
<td></td>
<td>2&gt; In general, I tried to purchase less number of units as compared to the number of units required for typical weekly consumption. (EFP Postpone2)</td>
<td></td>
</tr>
<tr>
<td>The use of expected future price as a reference during a period when the future price is expected to be higher than the current price (EFP Accelerate) (1-10 scale: 1- Strongly Disagree; 10- Strongly Agree)</td>
<td>1&gt; In general, I tried to purchase canned tuna in advance for a week. (EFP Accelerate1)</td>
<td>.591 ( p &lt; .000 )</td>
</tr>
<tr>
<td></td>
<td>2&gt; In general, I tried to purchase more number of units as compared to the number of units required for typical weekly consumption. (EFP Accelerate2)</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.4. The Influence of Descending Price Trend and Mode of Acquisition on the Use of Expected Future Price as a Reference in relation to Purchase Postponement (EFP Postpone)

<table>
<thead>
<tr>
<th>Mode of Acquisition</th>
<th>Price Trend</th>
<th>EFP Postpone (1-10 scale)</th>
<th>Standard Deviations</th>
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<td></td>
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Table 4.5. The Influence of Ascending Price Trend and Mode of Acquisition on the Use of Expected Future Price as a Reference in relation to Purchase Acceleration (EFP Accelerate)

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<th>Mode of Acquisition</th>
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<th>Standard Deviations</th>
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Table 4.6. The Influence of Price Trend and Mode of Acquisition on the Average Units Purchased during a Period

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<th>Average Units</th>
<th>Standard Deviations</th>
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**Figure 4.1.** Manipulation Check for the Frequency Manipulation
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![Perceived Frequency](image)

**Figure 4.2.** The Influence of Motivation to Process Price Information on the Use of Expected Future Price as a Reference during Regular/Non-Promotional (EFP Regular) and Promotional (EFP Promotional) Periods
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![The Use of Expected Future Price as a Reference during a Regular/Non-Promotional (EFP Regular) and a Promotional (EFP Promotional) Period](image)
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![Perceived Confidence in Predicting a Future Promotion](image)

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![Average Units Bought during a Regular/Non-Promotional Period](image)
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![Perceived Transaction Value from a Promoted Price](image)

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![The Use of Expected Future Price as a Reference during Promotional (EFP Promotional) Periods](image)
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![Average Units Bought during a Promotional Period](image1)

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![Graph showing the influence of frequency of promotions and motivation to process price information on the use of expected future price as a reference during a regular period.]

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(X: Frequency of Promotions; Y: EFP Promotional)

![Graph showing the influence of frequency of promotions and motivation to process price information on the use of expected future price as a reference during a promotional period.]

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<th>Hypothesis</th>
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<th>Dependent Variable(s)</th>
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Table 4.7: Summary of Results of All Hypotheses in Studies 1-3
SUMMARY

This chapter presented the data analyses for each of the three studies that were conducted to test the proposed hypotheses in chapter 2. First, results of preliminary reliability analyses were presented for the experimental measures used in a study, followed by the manipulation checks, and then the tests of the hypotheses. Tables and charts supporting the reported results were presented at the end of the chapter. As the results suggest, six of the proposed hypotheses were supported statistically based on the results, whereas seven other hypotheses could not be supported. A summary of the tests of hypotheses was presented in Table 4.7. The next chapter presents a review and discussion of the findings of the three studies, highlights the contributions and implications of this research for marketing theory and practice, and offers directions for future research.
Chapter 5

SUMMARY AND CONCLUSIONS

This chapter consists of four sections. First, the chapter reviews and discusses the findings of the three studies. Second, the chapter highlights the contributions and implications of this research for marketing theory. Third, the chapter presents the implications of the present research for marketing practitioners. Finally, the chapter offers directions for future research in the area of behavioral pricing research, especially in the area of consumers’ use of the expected future prices as a reference.

General Discussion of Research Findings

The three studies conducted as part of the current dissertation research offer several insights in understanding the factors that may lead consumers to use expected future prices of a product or brand as a reference in forming price judgments. Studies 1, 2, and 3 together highlight the influence that the frequency of price promotions, the consistency of price promotions, and/or the price trends may have on consumers’ use of expected future prices as a reference. These studies also offer findings with respect to the influence of individual difference variables such as the motivation to process price information and the mode of acquisition of price information on consumers’ use of expected future prices as a reference.

Study 1

Study 1 was conducted to test the influence of consumers’ motivation to process price information and the frequency of price promotions on the use of expected future price as a reference. Whereas the frequency of price promotions was found to have a positive relationship
with purchase postponement during a regular period and purchase acceleration during a promotional period, participants’ self reported use of the expected future price as a reference did not show a significant difference across the manipulated conditions of high and low motivation. Several possible explanations may be offered for the lack of influence of motivation to process price information on the reported use of the expected future price as a reference. Firstly, a manipulation check on the motivation manipulation was not conducted. Therefore, the possibility that the manipulation might not have worked cannot be ruled out. The experimental manipulation of motivation might not have been sufficient to override participants’ chronic motivation to process price information.

Secondly, it is also possible that the effect of the motivation manipulation might have dissipated during the experimental session. The participants had to make purchase decisions for 21 consecutive hypothetical periods. After first few rounds of decision making, the participants might have experienced a cognitive load, and hence, the effect of manipulation might have dissipated over time. Thirdly, it is possible that the participants in the high (versus low) motivation condition might have focused significantly more on processing the current price information because they were asked to pay attention to the possibilities to maximize the value they obtain from the purchases. The participants could have interpreted this instruction as to pay attention to the current prices, thereby not focusing on the expected future prices.

In contrast, the participants in the low motivation condition might not have focused extensively on the current price information because they were asked to make their purchase decisions as quickly as possible. These participants (as compared to the high motivation participants) might have been more likely to perceive that the prices were changing across periods because they might have spent less time on a single purchase period. Supporting
evidence for this possibility may be found in participants’ self reported use of the expected future price in response to promotional prices (EFP promotional). The mean values of EFP promotional corresponding to low versus high motivation were: EFP promotional\textsubscript{low} = 9.25 and EFP promotional\textsubscript{high} = 8.84 (figure 4.2). It should be noted that the motivation manipulation did not seem to influence participants’ self reported use of the expected future price in response to regular prices (EFP regular), for which the mean values were: EFP regular\textsubscript{low} = 7.03 and EFP regular\textsubscript{high} = 7.27 (figure 4.2). However, participants’ purchase decisions suggested that the high (versus low) motivation participants were behaving as if they were deliberately purchasing less during the regular price periods. Although an ANOVA with NonPromotion Units as the dependent variable and the motivation as the independent variable did not show a statistically significant effect of motivation on the number of units purchased during a regular period (NonPromotion Units), the means suggest that the high motivation participants purchased less than the low motivation participants \((F(1,129) = 1.49, p < .23, \eta = .11; \text{NonPromotion Units\textsubscript{low}} = 3.28; \text{NonPromotion Units\textsubscript{high}} = 3.16; \text{figure 5.1})\). Further data analysis also hints at an effect of the motivation manipulation on participants’ total purchases (Total Units = sum of purchases during all promotional and regular periods) in the experimental session. An ANOVA with Total Units as the dependent variable and the motivation as the independent variable suggest that the high motivation participants purchased fewer units than the low motivation participants \((F(1,129) = 2.13, p < .15, \eta = .13; \text{Total Units\textsubscript{low}} = 89.11; \text{Total Units\textsubscript{high}} = 87.91; \text{figure 5.2})\).

Results from study 1 also suggest that the effect of frequency of promotions on consumers’ use of expected future price as a reference may not be linear. The tests of H2a and H2b revealed that participants’ reported confidence in predicting the next promotion and consequently, their use of expected future price as a reference showed a significant quadratic
relationship with the frequency of promotions. The mean values of reported confidence corresponding to the three frequency conditions were $\text{CONF}_{\text{low}} = 4.25$, $\text{CONF}_{\text{medium}} = 4.83$, and $\text{CONF}_{\text{high}} = 7.58$ (figure 4.3). Therefore, it is likely that the rate at which the use of expected future price as a reference increases is different for the different levels of frequency of promotions. In study 1, the rate at which the use of expected future price as a reference increased between the medium and high levels of frequency was higher than the rate of increase between the low and medium levels of frequency.

Results from study 1 also contradicted the effects of the frequency of promotions on the perceptions of transaction value from a promoted price and on the use of expected future price as a reference during a promotional period, as predicted in H3a and H3b respectively. H3a (H3b) predicted that the frequency of promotions would be negatively related to the perceptions of transaction value from a promoted price (the use of expected future price as a reference during a promotional period (EFP promotional)). However, the mean values of the reported transaction value from a promoted price corresponding to the three conditions of frequency were: $\text{TransValuePromotion}_{\text{low}} = 7.46$, $\text{TransValuePromotion}_{\text{medium}} = 8.02$, $\text{TransValuePromotion}_{\text{high}} = 8.32$ (figure 4.5). Further, the mean values of EFP promotional corresponding to the three conditions of frequency were $\text{EFP promotional}_{\text{low}} = 8.62$, $\text{EFP promotional}_{\text{medium}} = 9.12$, and $\text{EFP promotional}_{\text{high}} = 9.37$ (figure 4.6). Thus, the direction of the effects was opposite to the predicted direction in H3a and H3b.

It was reasoned that consumers are less likely to expect a price promotion, and thus, more likely to perceive a higher transaction value from a promoted price when a product is promoted infrequently (versus frequently). However, the results from study 1 suggest the opposite. A possible explanation for this finding could be offered in terms of the effect that the frequency of
promotions may have on consumers’ sensitivity to price changes. It is likely that the frequency of promotions might have influenced participants’ price sensitivity positively. Thus, it may be argued that the effect of a price change on participants’ perceptions of transaction value and the use of expected future price as a reference could have been larger in the high (versus low) frequency condition.

Data obtained from study 1 also offers another interesting finding pertaining to the effect of the frequency of promotions on total units purchased during the experimental session. Previous research has consistently argued that a brand may hurt its sales in the long run if it is price promoted frequently (e.g. Macé and Neslin 2004; Mela, Jedidi, and Bowman 1998; Neslin, Henderson, and Quelch 1985). The basic rationale underlying this argument seems to be that consumers will adjust their purchase timing to coincide with the promotions. Thus, although the sales during a promotional period may be more than the sales during a regular period, the aggregate sales for a brand may not be different as compared to if the brand was never promoted. In other words, this argument seems to suggest that consumers may adjust their purchase timing decisions, but not their consumption behavior toward the brand, and thus, in a long run, will purchase more or less same number of units.

Data obtained from study 1 suggests a different possibility. Although an ANOVA with Total Units as the dependent variable and the frequency of promotions as the independent variable did not reveal a statistically significant effect of the frequency on total units ($F(2,129) = 1.84, p < .16, \eta = .12$), the means corresponding to the three conditions of the frequency suggest that participants in the high frequency condition purchased more units than the other participants: $\text{Total Units}_{\text{low}} = 88.60$, $\text{Total Units}_{\text{medium}} = 87.50$, $\text{Total Units}_{\text{high}} = 89.40$ (figure 5.3). Pairwise contrasts suggested that the difference between the medium and high conditions was significant.
Further, contrast analysis also suggested a quadratic trend across the three conditions of frequency ($F(1,129) = 3.04, p < .08, \eta = .15$). Therefore, extrapolating this finding from study 1 suggests that a high frequency of price promotions may indeed increase total sales in a long run. Therefore, whether frequent promotions help or hurt long-term sales may actually be an empirical question. If a brand is able to cover its loss in margins due to promotional prices with the increased volume of sales, then frequent promotions may not hurt long-term profitability.

*Study 2*

Study 2 was conducted to test the influence of temporal pattern of price promotions on the use of expected future price as a reference. The results from study 2 contrasted the hypothesized predictions in H4a and H4b. It was hypothesized that a consistent (versus random) pattern of price promotions would lead to a greater likelihood of the use of expected future price as a reference. However, the direction of the effects obtained in study 2 was opposite to the predicted direction. Participants’ reported use of the expected future price as a reference during a regular (EFP Regular) as well as a promotional (EFP Promotional) period was significantly higher when the pattern of promotions was random (versus consistent). The mean values of EFP Regular corresponding to the consistent/random pattern of promotions were $EFP\,\text{Regular}_{\text{consistent}} = 6.85$ and $EFP\,\text{Regular}_{\text{random}} = 8.05$ (figure 4.8), whereas the mean values of EFP Promotional were $EFP\,\text{Promotional}_{\text{consistent}} = 7.71$ and $EFP\,\text{Promotional}_{\text{random}} = 8.66$. A possible explanation for this effect may be offered in terms of the saliency of promotions as a function of the pattern of promotions. It may be argued that when promotions were randomly (versus consistently) spaced, they were more salient or noticeable to the participants. Participants might (not) have implicitly expected a promotion that was one of the consistently (randomly) spaced promotions.
Thus, a randomly spaced promotion could have been more salient or consciously noticeable than a consistently spaced promotion because it could have been relatively unexpected for the participants. Consequently, the probability that the participants consciously perceived the price changes might have been higher in case of a randomly (versus consistently) spaced promotion.

Findings from study 2 also suggest that there may not a difference in the effect of the consistent/random pattern of price promotions on the use of expected future price as a reference if the frequency of promotions is high. The mean values of EFP Regular corresponding to the four conditions of high/low frequency and consistent/random pattern were: EFP$_{\text{Regular Consistent High}}$ = 8.00, EFP$_{\text{Regular Random High}}$ = 7.84, EFP$_{\text{Regular Consistent Low}}$ = 5.83, EFP$_{\text{Regular Random Low}}$ = 8.26 (figure 4.9). Similarly, the mean values of EFP Promotional corresponding to the four conditions of high/low frequency and consistent/random pattern were: EFP$_{\text{Promotional Consistent High}}$ = 8.13, EFP$_{\text{Promotional Random High}}$ = 8.63, EFP$_{\text{Promotional Consistent Low}}$ = 7.33, EFP$_{\text{Promotional Random Low}}$ = 8.68 (figure 4.10). These findings suggest that when the frequency of promotions was high, there was not a significant difference between the uses of expected future price as a reference for the two conditions of the pattern of promotions. However, when the frequency of promotions was low, the random pattern resulted in higher use of the expected future price as a reference, as compared to the consistent pattern.

Further data analysis from study 2 suggests that when the frequency of promotions was low (high), the participants tended to purchase fewer units during a regular period - NonPromotion Units - when the pattern was random (consistent), as compared to when the pattern was consistent (random). Although an ANOVA with NonPromotion Units as the dependent variable, and the frequency and the pattern of promotions as the independent variables did not result in a statistically significant interaction effect ($F(1,71) = .97, p < .32, \eta = .12$), the
means corresponding to the four conditions of high/low frequency and consistent/random pattern were: NonPromotion Units\textsubscript{ConsistentHigh} = 2.40, NonPromotion Units\textsubscript{RandomHigh} = 2.67, NonPromotion Units\textsubscript{ConsistentLow} = 2.86, NonPromotion Units\textsubscript{RandomLow} = 2.54 (figure 5.4).

Following the tests of H2c, this purchasing pattern suggests that when the frequency of promotions was high (low), the likelihood of postponing purchases during a regular period was higher when the pattern of promotions was consistent (random).

*Study 3*

Study 3 was conducted to test the influence of price trends and the mode of acquisition of price information on the use of expected future price as a reference. It was hypothesized that if prices show either a descending (or an ascending trend), then consumers are more likely to use the expected future price as a reference, and consequently are more likely to postpone (accelerate) purchases when the mode of acquisition of price information is intentional (versus incidental). Results from study 3 did not support these predictions. The mode of acquisition of price information did not have a significant influence on either participants’ reported use of the expected future price as a reference or their purchase decisions in response to the ascending/descending price trends. It should be noted that the experimental procedure did not allow performing a manipulation check for the mode of acquisition of price information. Therefore, it is possible that the experimental manipulation might not have worked.

To test this possibility, a procedure similar to the one used for testing H5c was used. First the data were filtered to select the cases corresponding to participants primed with the intentional mode of acquisition and either the descending or ascending price trend. Then, an ANOVA was performed using AverageUnits as the dependent variable and price trend as the independent
variable. Although the ANOVA results indicate that the effect of price trend on the average quantities purchased was not statistically significant ($F(1,43) = 1.36, p < .25, \eta = .18$), the results indicated that the participants purchased significantly less average number of units in response to the ascending (versus descending) price trend. The mean values for the average units purchased corresponding to the price trend conditions were: $\text{AverageUnits}_{\text{ascending}} = 4.27$; $\text{AverageUnits}_{\text{descending}} = 4.60$ (figure 5.5). When compared with the results shown in figure 4.17, these results suggest that the pattern of purchases in response to ascending/descending trend was similar across the two conditions of the mode of acquisition. Therefore, it appears that the manipulation for the mode of acquisition of price information might not have worked. For both conditions of the mode of acquisition, it appears that the participants used previous prices as a reference rather than the expected future prices.

Theoretical Implications

The findings from studies 1, 2, and 3 together offer several implications for marketing theory, especially in the areas of behavioral pricing and consumers’ forward looking behaviors. Previous research in the area of behavioral pricing has argued for and provided extensive evidence in support of the role of the past prices and the current prices in formation of consumers’ price judgments. Although Jacobson and Obermiller (1990) and Monroe (2003) have argued for the role of the expected future prices in formation of price judgments, research to date has not identified the specific factors that may lead consumers’ to use the expected future prices as a reference in the relatively inexpensive, frequently purchased product categories. The current dissertation research contributes in addressing this gap by identifying several contextual and psychological factors that may lead to the use of expected future prices as a reference. Evidence
was found in support of the influence of the frequency of price promotions and the temporal pattern of price promotions in the use of expected future prices as a reference. It was found that the likelihood that consumers will use the expected future prices as a reference is higher when the frequency of promotions is relatively high (versus low) and/or the temporal pattern of price promotions is random (versus consistent). Although the current research findings also hint that consumers’ motivation to process price information may moderate the effect of the frequency of promotions on the use of expected future prices as a reference, the evidence obtained through the experimental studies was not conclusive. Further, the current research could not confirm the influence of the price trends and the mode of acquisition of price information on the use of expected future prices as a reference.

The finding that randomly (versus consistently) spaced promotions are more likely to lead to the use of expected future price as a reference is particularly interesting. Previous research has argued that when promotions are consistent (versus random), consumers may perceive the pattern of promotions better (Krishna 1994). Consequently, it was posited that the likelihood that consumers may use the expected future price as a reference would be higher when the promotions are consistently (versus randomly) spaced. However, the current research suggests a possibility that randomly spaced promotions may be more salient than consistently spaced promotions, and consequently, consumers’ conscious awareness of the price changes may be higher when promotions are randomly (versus consistently) spaced. Therefore, the likelihood that consumers will use the expected future prices as a reference during a regular period may be higher in case of randomly (versus consistently) spaced promotions. The current research also suggests that the effect of random/consistent pattern of promotions on the use of expected future prices as a reference is likely to be more pronounced when the frequency of promotions is
relatively low. The findings from study 2 suggest that when the frequency of promotions is relatively high, then the effect of frequency on the use of expected future prices as a reference may override the effect of temporal pattern of promotions. However, when the frequency of promotions is relatively low, then a random pattern of promotions may result in a higher use of the expected future prices as a reference, as compared to a consistent pattern.

The current dissertation research also contributes to the previous research on consumers’ forward looking behavior. Although previous research has been consistent in suggesting that consumers may adjust their purchase timing and quantity decisions in response to the frequency of promotions, research has differed in terms of the underlying psychological mechanisms driving this purchasing behavior. A stream of research has argued for the role of consumers’ expectations of the future prices as the driver of their purchase timing and quantity decisions in response to the frequency of promotions (e.g. Blattberg and Neslin 1989; Mela, Jedidi, and Bowman 1998). Other research has suggested for the role of implicit conditioning as the driving mechanism for the same effect (e.g. Fader and McAlister 1990; Kalwani and Yim 1992).

This research suggests that a proliferation of promotional activity may implicitly train/condition consumers to buy only on promotions. Thus, consumers’ purchase timing and quantity decisions in response to the frequency of promotions may be driven more by their automatic, conditioned reactions to the promotions, rather than conscious processing and the use of expectations. Existing research has not been able to resolve this conflict because the methodological constraints associated with modeling approach. Because previous research on consumers’ response to the frequency of promotions has used cross-sectional data obtained from consumer scanner panels, the hypothesized causal mechanisms related to consumers’ response had to be assumed. The current research addresses this gap by showing direct evidence that the
frequency of promotions may influence consumers’ expectations about the future promotions, and consequently their purchase postponement/acceleration decisions.

Managerial Implications

Of the several factors that the current dissertation research examined for their influence on the use of expected future prices as a reference, the frequency of price promotions, the temporal pattern of price promotions, and to some extent, price trends are typically managerially controllable. Further, it is likely possible to discover demographic factors that may correlate with consumers’ motivation to process price information and their typical mode of acquisition of price information. With the knowledge of the relevant, correlated demographics, managers may be able to segment the market based on the above psychological characteristics, and use the findings from this dissertation research to control the frequency and temporal pattern of promotions and price trends in order to induce desired consumer response.

The current research findings suggest that when a brand is promoted frequently, it will influence consumers’ expectations about the future promotions, and consumers may try to postpone their purchases during a regular period to a promotional period. If managerial objective would be to minimize the likelihood of purchase postponement, then managers may consider promoting their brand less frequently. Further, the current research findings suggest if a brand is promoted less frequently, then consistently (versus randomly) spaced promotions are less likely to lead to the use of expected future prices as a reference. Therefore, managers may want to keep their price promotions consistently spaced in order to minimize the likelihood of purchase postponement during regular periods.

Previous research by Cooke, Meyvis, and Schwartz (2001) suggests that consumers likely
experience regret when consumers’ price expectations are disconfirmed, and consequently, the feelings of regret tend to systematically influence their subsequent decisions. For example, if a consumer who might have postponed purchasing in expectations of a lower price in the future encounters a higher price in the future, s/he is likely to experience regret toward the decision of postponing. When the same consumer faces a similar decision situation in the near future, s/he is likely to be biased against postponing purchases even though the expected value of postponing might be higher than the other decision options.

In contrast, when purchases are postponed and expectations are confirmed, consumers are likely to be biased in favor of postponing again even though the expected value of postponing might be lower than the other decision options. Using the findings from the current dissertation research and scanner data, retail managers may be able to estimate the likelihood that consumers might have postponed their purchases in a product category in response to the frequency of price promotions in that category. Consequently, managers may be able to manipulate the prices so as to either confirm or disconfirm consumers’ price expectations in that category, which may likely have an influence on consumers’ current purchasing decisions in the other product categories or future decisions in the same product category.

The current dissertation research also offers implications for dynamic pricing practices in general. By understanding the influence of dynamically changing prices on consumers’ purchase postponement and advance buying behaviors, managers may be better informed about their pricing strategies and tactics to obtain a desired consumer response to the dynamic prices over time.
Future Research

Future research should examine the role of motivation to process price information on the use of expected future prices as a reference. The current research has offered inconclusive findings regarding the role of motivation to process price information. In an experimental context, either a different way of manipulating the motivation to process price information should be used and/or a way for performing manipulation check for the current manipulation of motivation should be devised. It was argued that the effect of the motivation manipulation could have dissipated during the experimental session because the experiment involved decision making for 21 consecutive weeks. If indeed the experimental session was long enough for the manipulation to lose its effect, then future research could explore this possibility by limiting decision making to less than 15 or less than 10 periods. In order to limit the number of periods of decision making, future research could also explore different frequencies of promotion for manipulating high, medium, and low frequency conditions. For example, future research could use frequency of promotion as once every six weeks instead of seven weeks for manipulating the low frequency condition. Instead of manipulating the motivation to process price information, future research could also use the measures of dispositional motivation to process price information for examining the influence of motivation on the use of expected future price as a reference. If indeed the motivation manipulation dissipated during the experimental session, then it appears likely that the participants’ purchase decisions could have been driven by their dispositional tendencies. Thus, measuring the motivation at the end of experimental session using a self-report scale may help in identifying the role of motivation in the use of expected future price as a reference.

Future research could also investigate the underlying mechanisms for the effect of
motivation on the use of expected future price as a reference. As figure 4.2 suggests, the difference between the reported use of the expected future price as a reference during a regular versus a promotional period was relatively higher for the low (versus) motivation participants. A possible reason underlying this finding could be that the participants’ responses were partly driven by the level of arousal they experienced on exposure to a promotional price. The low (versus high) motivation participants could have experienced relatively higher level of arousal or excitement on exposure to a promotional price, and thus could have reported a relatively higher use of the expected future price as a reference during a promotional period versus a regular period. In other words, the signaling effect of a promotional price could have been higher in the case of low (versus high) motivation participants. Consequently, the mere presence of a promotion might have driven decision making of the low motivation participants, whereas a combination of the presence of a promotion and the magnitude of the discount could have driven decision making of the high motivation participants. Future research should examine this possible explanation underlying the influence of motivation manipulation on the reported use of expected future price as a reference.

Future research should also investigate the demographic factors that may correlate with the motivation to process price information. From a managerial standpoint, knowledge of relevant demographic factors would present more actionable implications, rather than knowledge of only the psychological variable of motivation. With the help of relevant demographic factors, future research could also use data obtained from consumer scanner panels to examine the current research hypotheses in a field setting. Examining the current research hypotheses in a field setting would likely enhance ecological validity of the research findings presented in this dissertation research. Future research could also use field experiments for enhancing external
validity of the current research findings.

Future research should also examine the role of the mode of acquisition of price information in the use of expected future prices as a reference. As with motivation to process price information, the current research has also offered inconclusive findings regarding the influence of the mode of acquisition of price information. Either a different technique of manipulating the mode of acquisition and/or a technique to perform a manipulation check for the current manipulation would be useful in understanding the role of the mode of acquisition of price information. Future research could ask the participants to recall the prices observed during the experimental session to validate whether intentionally (versus incidentally) primed participants remembered relatively more prices. Given the lack of support for the use of expected future price as a reference in response price trends, future research should investigate the mechanism underlying this effect. A possibility is that the participants might have expected the price trend to reverse in the future, rather continue in the ascending or descending fashion. Consequently, the participants might have continued to purchase relatively more (less) units when faced with a descending (ascending) price trend. Future research should be conducted to examine whether participants expected price trends to reverse when exposed to ascending/descending price trends. Future research could also manipulate participants’ future orientation to examine whether such a manipulation may moderate the influence of the price trends on the use of expected future price as a reference.

The nonlinear effect of the frequency of price promotions on the use of expected future prices as a reference also merits further investigation. Although the current research hypothesized a positive relationship between the frequency of promotions and the use of expected future prices as a reference, a specific functional form of this relationship was not
predicted. The findings from study 1 suggest that the frequency of promotions may not necessarily have a linear effect on the use of expected future prices as a reference. It appears worthwhile to investigate a theory underlying such a nonlinear effect. If indeed the frequency of promotions has a nonlinear effect on the use of expected future prices as a reference in a field setting too, then it will be useful for managers to understand the critical level for the frequency of promotions that may lead to an increased rate of the use of expected future prices as a reference.

The current findings regarding the role of temporal pattern of promotions on the use of expected future prices as a reference also present interesting questions for investigation in future research. The current finding is especially interesting because of the contrasting nature of the finding as compared to previous research. In contrast to previous research, the current findings suggest that randomly spaced promotions may result in a higher use of the expected future prices, as compared to consistently spaced promotions. Future research should examine the underlying psychological mechanisms driving this effect. It was speculated that randomly spaced promotions might be more noticeable than consistently spaced promotions, and thus leading to the use of expected future prices as a reference. Future research should test whether this explanation could be supported or if an alternate explanation for the above effects could be hypothesized.

Future research also needs to examine factors that may lead to the use of expected future prices as a reference in response to price trends. The current research offered inconclusive findings regarding the influence of the mode of acquisition of price information on the use of expected future prices as a reference in response to price trends. The current research findings are in line with previous research by Della Bitta and Monroe (1974) and Meyer and Assunção (1990) who have reported that consumers may use previously seen prices as a reference when
faced with price trends. These research findings are in contrast with the predictions of the neoclassical economic theory that suggests that consumers’ use of the expected future prices should be positively related to price trends. Therefore, future research could be conducted to examine the factors that may lead consumers to use previous versus expected future prices as a reference in response to price trends.
SUMMARY

This chapter presented a general discussion of the research findings obtained in the three studies conducted to test the hypotheses presented in chapter 2. Several explanations were offered for the results that did not confirm some of the hypotheses. Additional data analyses were also presented to explore possible relationships that were not directly related to the hypotheses, but could offer potentially interesting findings. This chapter also offered a discussion of the theoretical and managerial implications of the current dissertation research. It was suggested that the current research contributes to marketing theory in the areas of behavioral pricing and consumers’ forward looking behavior. From a managerial perspective, several possibilities were discussed, that could potentially offer actionable implications for managers to segment markets, practice dynamic pricing tactics, and potentially manipulate consumers’ cross-category response as a result of dis/confirmation of their price expectations in a product category. In the end, several possibilities were presented for conducting future research to support, reexamine and/or extend the current research findings.
Figure 5.1. The Influence of the Motivation to Process Price Information on Average Units Purchased during a Regular/Non-Promotional Period
(X: Motivation to Process Price Information; Y: Average Units Purchased during a Regular Period)

Figure 5.2. The Influence of the Motivation to Process Price Information on Total Units Bought during the Experimental Session
(X: Motivation to Process Price Information; Y: Total Units Bought)
**Figure 5.3.** The Influence of the Frequency of Promotions on Total Units Bought during the Experimental Session
(X: Frequency of Promotions; Y: Total Units Bought)

**Figure 5.4.** The Influence of the Frequency of Promotions and the Pattern of Promotions on Average Units Bought during a Regular/Non-Promotional Period
(X: Pattern of Promotions; Y: Average Units Bought)
Figure 5.5. The Influence of Price Trend on the Average Units Purchased during a Period by the Participants Primed with Intentional Mode of Acquisition
(X: Price Trend; Y: Average Units Purchased during a Period)

Average Units Purchased during a Period when Primed with Intentional Mode of Acquisition

Average Units Purchased during a Period when Primed with Intentional Mode of Acquisition

Price Trend

Ascending

Descending

4.27

4.6
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Sun, Baohong, Scott A. Neslin, and Kannan Srinivasan (2003), "Measuring the Impact of Promotions on Brand Switching when Consumers are Forward Looking," *Journal of
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APPENDICES

APPENDIX 1

Study 1 Materials
Experimental Scenario

Please consider the following situation.

John Murphy shops at a local grocery store for his weekly grocery purchases and other miscellaneous items. Every week, the grocery store publishes advertising flyers containing information such as available products, brands, their prices, special offers etc. John usually browses the advertising flyers and then makes his weekly purchase decisions.

In today's session, we will show you the weekly advertising flyers that the grocery store publishes. To make your job easier, we will show you the flyers only for the product category of canned tuna.

Please note that John's weekly consumption of canned tuna is: 4 units of 5-ounce canned tuna. Also, note that John cannot purchase more than 8 units of canned tuna in a week due to his budget constraints.

Use the paper and pen provided to you to note the above numbers because you will not be able to come back to this screen after you proceed ahead.

On the following screens, we will show you the weekly advertising flyers published by the local grocery store where John shops for his weekly purchases. The brand names are intentionally not shown so that John's brand preferences are not disclosed.

Please consider the information contained in a weekly flyer and also John's weekly consumption of the advertised product. Based on that, we will ask you to recommend the number of units that John should purchase for that week. Feel free to use the paper and pen provided to you to keep a track of your weekly purchase decisions.
Considering the information contained in the weekly flyer, John's weekly consumption of canned tuna, and his budget constraints, please recommend the number of units of canned tuna that John should purchase this week.

Please write your recommendations below:

**Manipulations**

*Frequency of Price Promotions.* Following table represents the weekly prices of canned tuna over 21 weeks that were shown to the participants corresponding to high (once every three
weeks), medium (once every five weeks) and low (once every seven weeks) frequency conditions respectively.

<table>
<thead>
<tr>
<th>Week</th>
<th>Price (canned tuna) High Frequency</th>
<th>Price (canned tuna) Medium Frequency</th>
<th>Price (canned tuna) Low Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1.89</td>
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<td>2</td>
<td>$1.89</td>
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<tr>
<td>3</td>
<td>$1.89 $1.39</td>
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<td>4</td>
<td>$1.89</td>
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<tr>
<td>5</td>
<td>$1.89</td>
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<td>6</td>
<td>$1.89 $1.39</td>
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<td>7</td>
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<td>9</td>
<td>$1.89 $1.39</td>
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<tr>
<td>10</td>
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<td>11</td>
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<td>$1.89 $1.39</td>
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<td>15</td>
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<td>16</td>
<td>$1.89</td>
<td>$1.89 $1.39</td>
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<td>19</td>
<td>$1.89</td>
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<td>20</td>
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<td>21</td>
<td>$1.89 $1.39</td>
<td>$1.89 $1.39</td>
<td>$1.89 $1.39</td>
</tr>
</tbody>
</table>
**Motivation to Process Price Information (High).** Please make sure that you pay attention to the possibilities to maximize the value you obtain from the purchases. Your name will be entered in a lottery to win a $50 gift card if your ratio of the number of products purchased and the total price paid over the experimental session is the best among all participants in your experimental session.

**Motivation to Process Price Information (Low).** Please make sure that you make your purchase decisions as quickly as possible without violating any purchase constraints. Your name will be entered in a lottery to win a $50 gift card if you do not violate any purchase constraints, and if the total time you take to make all purchase decisions is the least among all participants in your experimental session.

**Measurements**

*Use of an expected future price as a reference:* (1-10 scale: 1- Not At All; 10- Very Much)

Please let us know the degree to which you agree with the following statements that may describe your purchasing decisions during this experimental session.

1. When canned tuna was selling at its regular price (i.e. when it was not price promoted), I tried to postpone purchasing it (EFP Regular1).

2. When canned tuna was selling at its regular price (i.e. when it was not price promoted), I tried to purchase less number of units as compared to the number of units required for typical weekly consumption (EFP Regular2).

3. When canned tuna was price promoted, I tried to purchase it in advance (EFP Promotional1).

4. When canned tuna was price promoted, I tried to purchase more number of units as
compared to the number of units required for typical weekly consumption (EFP Promotional2).

*Perceived confidence in predicting the next price promotion:* (1-10 scale: 1- Not Confident At All; 10- Very Confident)

1. If you postponed purchasing canned tuna during a week in anticipation of a price promotion, how confident were you that a price promotion will be available soon? (postpone confidence1)

2. During a week, if you purchased less number of units of canned tuna as compared to the number of units required for typical weekly consumption, how confident were you that a price promotion will be available soon? (postpone confidence2)

3. If you purchased canned tuna in advance during a week when it was price promoted, how confident were you that a price promotion will not be available soon? (accelerate confidence1)

4. During a week, if you purchased more number of units of canned tuna as compared to the number of units required for typical weekly consumption, how confident were you that a price promotion will not be available soon? (accelerate confidence2)

*Perceived transaction value:* (1-10 scale: 1-Not At All; 10- Very Much)

Please let us know the degree to which you agree with the following statements.

1. When canned tuna was price promoted, it offered great value.

2. When canned tuna was selling at its regular price (i.e. when it was not price promoted), the deal was not beneficial.
APPENDIX 2

Study 2 Materials
**Experimental Scenario**

Please consider the following situation.

John Murphy shops at a local grocery store for his weekly grocery purchases and other miscellaneous items. Every week, the grocery store publishes advertising flyers containing information such as available products, brands, their prices, special offers etc. John usually browses the advertising flyers and then makes his weekly purchase decisions.

In today's session, we will show you the weekly advertising flyers that the grocery store publishes. To make your job easier, we will show you the flyers only for the product category of canned tuna.

Please note that John's weekly consumption of canned tuna is: 4 units of 5-ounce canned tuna. Also, note that John cannot purchase more than 8 units of canned tuna in a week due to his budget constraints.

Use the paper and pen provided to you to note the above numbers because you will not be able to come back to this screen after you proceed ahead.

On the following screens, we will show you the weekly advertising flyers published by the local grocery store where John shops for his weekly purchases. The brand names are intentionally not shown so that John's brand preferences are not disclosed.

Please consider the information contained in a weekly flyer and also John's weekly consumption of the advertised product. Based on that, we will ask you to recommend the number of units that John should purchase for that week. Feel free to use the paper and pen provided to you to keep a track of your weekly purchase decisions.
Representative Weekly Advertising Flyer

Week 1

5-ounce Canned Tuna

$1.89

Considering the information contained in the weekly flyer, John's weekly consumption of canned tuna, and his budget constraints, please recommend the number of units of canned tuna that John should purchase this week.

Please write your recommendations below:

Manipulations

Temporal Consistency of Price Promotions. For each frequency (high: once every three weeks, low: once every five weeks), temporal consistency of price promotions was manipulated
as shown in the following table. Following table represents prices of canned tuna over 21 weeks for the high frequency (once every three weeks) condition.

<table>
<thead>
<tr>
<th>Week</th>
<th>Price (canned tuna) Consistent Promotions</th>
<th>Price (canned tuna) Random Promotions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1.89</td>
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<td>$1.89</td>
<td>$1.89 $1.39</td>
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<tr>
<td>20</td>
<td>$1.89</td>
<td>$1.89</td>
</tr>
<tr>
<td>21</td>
<td>$1.89 $1.39</td>
<td>$1.89</td>
</tr>
</tbody>
</table>
Motivation to Process Price Information (High). Please make sure that you pay attention to the possibilities to maximize the value you obtain from the purchases. Your name will be entered in a lottery to win a $50 gift card if your ratio of the number of products purchased and the total price paid over the experimental session is the best among all participants in your experimental session.

Measurements

Use of an expected future price as a reference: (1-10 scale: 1- Not At All; 10- Very Much)

Same scale as described in Appendix 1 was used to measure the use of an expected future price as a reference.
APPENDIX 3

Study 3 Materials
Experimental Scenario

Please consider the following situation.

John Murphy shops at a local grocery store for his weekly grocery purchases and other miscellaneous items. Every week, the grocery store publishes advertising flyers containing information such as available products, brands, their prices, special offers etc. John usually browses the advertising flyers and then makes his weekly purchase decisions.

In today's session, we will show you the weekly advertising flyers that the grocery store publishes. To make your job easier, we will show you the flyers only for the product category of canned tuna.

Please note that John's weekly consumption of canned tuna is: 4 units of 5-ounce canned tuna. Also, note that John cannot purchase more than 8 units of canned tuna in a week due to his budget constraints.

Use the paper and pen provided to you to note the above numbers because you will not be able to come back to this screen after you proceed ahead.

On the following screens, we will show you the weekly advertising flyers published by the local grocery store where John shops for his weekly purchases. The brand names are intentionally not shown so that John's brand preferences are not disclosed.

Please consider the information contained in a weekly flyer and also John's weekly consumption of the advertised product. Based on that, we will ask you to recommend the number of units that John should purchase for that week. Feel free to use the paper and pen provided to you to keep a track of your weekly purchase decisions.
Considering the information contained in the weekly flyer, John's weekly consumption of canned tuna, and his budget constraints, please recommend the number of units of canned tuna that John should purchase this week.

Please write your recommendations below:

Manipulations

Price Trends. Following table represents the weekly ascending/descending prices of canned tuna over 10 weeks that was shown to the participants.
<table>
<thead>
<tr>
<th>Week</th>
<th>Ascending Price Trend (canned tuna)</th>
<th>Descending Price Trend (canned tuna)</th>
<th>No Price Trend (canned tuna)</th>
</tr>
</thead>
<tbody>
<tr>
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Motivation to Process Price Information (High). Please make sure that you pay attention to the possibilities to maximize the value you obtain from the purchases. Your name will be entered in a lottery to win a $50 gift card if your ratio of the number of products purchased and the total price paid over the experimental session is the best among all participants in your experimental session.

Acquisition of Price Information (Intentional). Please try to remember the prices when you make your purchase decisions for a week. Remembering the prices is important for making the best purchase decisions during subsequent purchase occasions.
Acquisition of Price Information (Incidental). Please try to make your purchase decisions as quickly as possible for a week. Making quick decisions is important for making the best purchase decisions during subsequent purchase occasions.

Measurements

Use of an expected future price as a reference: (1-10 scale: 1 - Not At All; 10 - Very Much)

Same scale as described in Appendix 1 was used to measure the use of an expected future price as a reference.